Effect of different levels of *Ziziphora (Thymus vulgaris)* with commercial probiotic lactofeed on blood parameters of broilers challenged by dexamethasone

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Objectives: the aim of this study was, evaluated the effect of different levels of Ziziphora (Thymus vulgaris) with commercial probiotic lactofeed on blood parameters of broilerchallenged by dexamethasone.

Materials & Methods: In this study 192 male broiler chicks Ross 308, in 8 treatments group and 4 replicates and 8 chicks in every replicates, and the treatments included: 1. Basal diet without any feed addetives and injection, 2. Basal diet plus 1.5% *Ziziphora, 3. Basal diet plus 1% Ziziphora, 4. Basal diet with 0.02%* lactofeed, 5. Basal diet with dexamthason injection, 6. Basal diet plus 1.5% *Ziziphora* and with dexamthason injection, 7. Basal diet plus 1% *Ziziphora* and with dexamthason injection, 8. Basal diet *with 0.02%* lactofeed and with dexamthason injection.

Results & Conclusion: Results of this study, that showed, the injection of dexamthason increased total protein, albumin, and globulin in sera significantly, also decreased the lymphocyte cells and increased the monocyte of blood cells, significantly. This study showed the dexamthason increased blood parameters and, *Ziziphora* powder and lactofeed were decreased them.

Keywords: *Ziziphora*, lactofeed, dexamethasone, blood, broiler

The effect of different levels of *Ziziphora (Thymus vulgaris)* with commercial probiotic lactofeed on Newcastle and avian influenza titre of broilers challenged by dexamethasone

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Objectives: the aim of this study was, evaluated the effect of different levels of Ziziphora (Thymus vulgaris) with commercial probiotic lactofeed on humoral immunity of ND and AI of broiler challenged by dexamethasone.

Materials & Methods: In this study 192 male broiler chicks Ross 308, in 8 treatments group and 4 replicates and 8 chicks in every replicates, and the treatments included: 1. Basal diet without any feed addetives and injection, 2. Basal diet plus 1.5% *Ziziphora, 3. Basal diet plus 1% Ziziphora, 4. Basal diet with 0.02%* lactofeed, 5. Basal diet with dexamthason injection, 6. Basal diet plus 1.5% *Ziziphora* and with dexamthason injection, 7. Basal diet plus 1% *Ziziphora* and with dexamthason injection, 8. Basal diet *with 0.02%* lactofeed and with dexamthason injection.

Results & Conclusion: Results of this study, that showed, the injection of dexamthason decreased the humoral titre of ND and AI, significantly, also the *Ziziphora* powder and lactofeed were increased the ND titre and not sighnificant effect of AI. This study showed the dexamthason decreased titre, and, *Ziziphora* powder and lactofeed were increased, just ND titre.

Keywords: *Ziziphora*, lactofeed, dexamethasone, humoral titre, broiler

Effect of aloe vera extract on reducing aflatoxin b1in eggs of laying hen and egg yolk

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Aflatoxins (AFs) are natural mycotoxins produced by some fungal species. These toxin carcinogens. AFs are classified in to four groups AFB1, AFB2, AFG1 and AFG2. Aflatoxin B1 is Dangerous toxin among mycotoxins. This toxin not only causes cereal damage but also contaminate the animals feed. So it can easily enter the animal products such as meats, eggs and threatens the health humans and animals. It has been realized that AFB1 cannot be absolutely isolated from diet even many attempts have been made to limit exposure to AFB1. So, it is of immense importance to eliminate the negative effects on human health through the exposure of AFB1. The use of herbal extract to reduce or control aflatoxin B1 is safe method rather than chemical method. Due to the accumulation of aflatoxin residues in muscle andegg of chickens, and the antifungal and antioxidant effects of Aloe Vera, this study conducted to determine the effectiveness of Alove Vera extract on inhibiting or reducing the amount of aflatoxin B1 in eggs and broiler chicken muscle. In this study, 28laying hens 20 broiler chickens were randomly divided in to four groups: negative control, positive control, treated group with 100 ppm Alovevera and 300 ppm Alovevera. The chickenswere fed with Aflatoxin B1 and Alovevera extract for 28 day. The eggs of chicken and broiler chicken meat were collected on day 14 and 28 and, the residue amount of Aflatoxin B1 was measured by ELISA kit. The results of this study showed significant difference in reducing and inhibiting the accumulation of AFB1 in egg yolk (p-value <0.05), but no significant difference was observed in meat chicken muscle. This study shows that Alove Vera extract is effective in inhibiting and decreasing AFB1 in egg yolk.

Key word:Aflatoxin B1, Alovevera, Egg, Broiler chicken muscle

Antibiotic resistance pattern of escherichia coli serovars isolated from broiler chickens in khoy city of west-azerbaijan provenance

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Objectives: Escherichia.Coliserovarsare a major zoonotic pathogen that cause omphalitisand colibacillosisin young broilers along withdifferent antimicrobial resistance patterns.

Methods: microorganisms were characterized and identified from yolk suck and hepatic tissue of young broilerschickens through physiological, biochemical tests and methods described in the Bacteriological Analytical Manual of the Food and Drug Administration. The antibiotic resistance pattern of E.coliserovarsisolates with API identification kits from 200 samples of broiler chickens collected from poultry forms inKhoy city fromSeptember 2021 to September 2022 were screened by Kirby-Bauer disc diffusion susceptibility test to a panel of 14different antibiotics.

Results: Samples mostly were 2 weeks old. Antimicrobial resistance of E.coli against Colistin(8%), Florfenicol(18%), Neomycin(90%), Erythromycin(36.66%), Tylosin(74%), Doxycucline(16%) , Lincospectin (38%), Danofloxacin (2%), Soltrim (27%), Fosfomycin (7%), Tiamulin (92%) and Tilmicosin (63%). No E.coli isolates were resistant toEnrofloxacin andGentamicin.

Conclusions: This study indicated that bacteria isolated from samples were resistant to multiple antibiotics, presumably due to antibiotic overuse and arbitrary use. Fluoroquinolones were still first choice against E.Coliserovars and medicinal composition of Colistin with Enrofloxacin or Soltrim are good choices due to the agonistic effect.Tiamulin and Tilmicosin ineffectiveness are acceptable through E.Coliserovars structural differences.

Key words: broiler chickens- Escherichia.Coli- zoonotic microorganism- Antimicrobial resistance- West-Azerbaijan provenance-

Prevalence and antibiotic resistance pattern of salmonella.spp and escherichia coli serovars isolated from raw chicken kebabs in urmia city of west-azerbaijan provenance

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Background: Salmonella and Escherichia.Coliserovarsare a major zoonotic pathogen that cause gastrointestinal disease in human along with high prevalence of antimicrobial resistance.

Methods: microorganisms were characterized and identified from raw chicken kebabs packs through physiological, biochemical tests and methods described in the Bacteriological Analytical Manual of the Food and Drug Administration .The antibiotic resistance pattern of S.Paratyphi A, S.typhi and E.coli isolates with API identification kits from 60 samples collected from chicken shops located in Urmia city in 2022 summer were screened by Kirby-Bauer disc diffusion susceptibility test to a panel of 15 diffrent antibiotics.

Results: Prevalence of the isolated S.Paratyphi A, S.typhi and E.colirespectively was 10%,17% and 64%.Antimicrobial resistance of S.Paratyphi A was detected against Amoxicillin(100%), Neomycin(83.33%), Erythromycin(100%), Gentamycin(66.66%), Cefalexin(73.33%), Tylosin (100%) and S.typhi resistant against Amoxicillin (100%), Erythromycin(100%), Tylosin (100%), Cefalexin(33.33%) and E.coli resistant against Colistin(50%), Amoxicillin(100%), Neomycin(66.66%), Erythromycin(100%), Tylosin(100%) Cefalexin (100%) , Lincospectin (50%). No salmonella and E.coli isolates were resistant to Ciprofloxacin, Tetracyclines, Florfenicol and Sultrim.

Conclusions: This study indicated that bacteria isolated from raw meat were resistant to multiple human used antibiotics. In order to reduce contaminated meats and prevention horizontal and mechanical transmission of this zoonotic microorganism, meats must be grilled well and individuals have to avoid eating raw or touching without gloves the raw chicken packs.

Key words:chicken meat-salmonella.spp- Escherichia.Coli- zoonotic microorganism- Antimicrobial resistance- west-Azerbaijan provenance

antibiotics resistance of salmonella isolated from broiler chickens in urmiacity to five antibacterial agents commonly used in the iranian medical field

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Background and Aim: Salmonellosis is an important zoonotic disease in worldwide that causes food-borne disease, gastroenteritis, enteric fever and bacteremia in humans. The purpose of this study was to determine the prevalence of salmonella in broiler flocks of Urmia city and determination of antibiotics resistance of salmonella isolated to five antibacterial agents commonly used in the Iranian medical.

Methods: One-hundred and eighty-nine samples including 70 liver and heart, and 49 intestine were collected for identification of salmonella from March 2021 to September 2022. After microbial culture and isolation, serotyping with anti-sera monovalent was performed. The Antibiotic resistance patterns of isolates was determined by disc diffusion test.

Results: In 7.4% samples were positive to Salmonella. All isolates were resistant to tetracycline. The highest resistance was to cotrimoxazole (50.0%), amoxicillin (35.7%) and ciprofloxacin (14.4%). No salmonella isolates were resistant to ceftriaxone.

Conclusion: The results of this study show the dominant serotype was salmonella entritidis and the high frequency of resistance to the three drugs tetracycline, cotrimoxazole and amoxicillin commonly used in the Iranian medical field. These findings are important for public health.

Keywords: Salmonella, Antimicrobial resistanc, west-azerbaijanprovinc-zoonotic disease

Molecular detection of infectious Coryza in broiler flocks by PCR method in Alborz province

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Infectious Coryza (IC) is an acute respiratory disease in poultry caused by bacteria from the Pasteurellacea family in the Avibacterium genus,*Avibacterium Paragallinarum*. This disease has no age limit and has a global spread, and in our country, Iran the diseaseclinically in backyard and industrial chickens is known to clinicians. In most countries, broiler flocks suffer from respiratory problems caused by several viral and bacterial agents, including Av. paragallinarum. Meattype birdsdespitethe short life span and due to the lack of vaccination against IC are expected to be exposed to the infection by showing mild form of signs such as swelling-head-symptom that make underestimation about exact situation of IC in flocks. This study is preliminary to estimate IC infection on meat type farms inAlborzprovince usingby molecular method of PCRcalled HPG-2 using specific primers. The test was performed on swab samples prepared from the choanal cleft of broiler chickens before slaughter from Oct to May. PCR test resultsshowed that 16 farmsout of 30,were found to be positively infected with the infectious Coryza agent. This study showed that the high level of ICinfection in broiler flocks, along with native rural flocks that generally do not receive vaccines,can significantly plays a role as a source of diseasefor layer and layer breeder farms in region.

Evaluation of bioactive peptides derived from cottonseed on growth performance, carcass characteristics, immune responses, small intestinal morphologic and microbiota responses and total antioxidant capacity of serum, and small intestine in broiler chickens

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Objectives: This experiment was conducted to examine the effects of dietary inclusion of cottonseed protein hydrolysate (CPH) as an alternative to antibiotic growth promoters on growth performance, carcass traits, immune responses, small intestine morphologic and microbiota responses and total antioxidant capacity (T-AOC) of serum, and small intestine in broiler chickens.

Materials & Methods: A total of four hundreds Ross 308 day-old female broilers were assigned to 4 treatments with 5 replicates. Three dietary were regulated to possess 0 (control), 5, and 6 g CPH/kg of diet in confronting with control + 2 mg lincomycin. All measurable factors related to performance criteria including body weight (BW), feed intake and feed conversion ratio (FCR) were calculated in different growth periods. Carcass traits were determined at termination of the experiment. The chickens were vaccinated against *H9N2* sub-type of type-A Avian Influenza (AIV) and Newcastle disease virus (NDV) at 7 d of age by subcutaneously injection of 0.2 mL/bird inactivated vaccine. At 28 d, antibody titers against NDV and AIV were measured using the hemagglutination inhibition test.

At 38 d of age microbial and morphological responses of the small intestine were measured. T-AOC was measured by Coomassie brilliant blue procedure.

Results & Conclusion: The broilers receiving 6 g CPH/kg of diet had greater final body weight and FCR in contrast with those fed basal diet ($P < 0.05$). The percentage of pancreas and cecum was premiere in broilers fed diets containing 6 g CPH/kg of diet confront to those fed basal diet ($P < 0.05$). The dietary treatments couldn't induce any marked effects on morphological parameters of small intestine ($P > 0.05$). Broilers supplemented with lincomycin or 6 g CPH/kg of diet had less coliform counts in comparison with those fed basal diet ($P < 0.05$). The T-AOC of jejunum was higher in boilers fed diets containing CPH compared to those fed diets supplemented with lincomycin ($P < 0.05$). Addition of 6 g CPH/kg of diet enhanced antibody titers against AIV compared to other groups ($P < 0.05$). In conclusion the results indicated that supplementation of 6 g CPH/kg of diet could induce beneficial impacts on performance criteria by cause of an improvement in small intestine health and it could enhance antibody titers against AIV.

Keywords: Bioactive peptides, bird, Immunity, lincomycin, total antioxidant capacity.

Reducing the incidence of microbial diseases with online monitoring of poultry farms through the knowledge-based enterprise

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Background and Aim: Knowledge-based enterprises usually present products that are built on new knowledge. In addition to feeling the need for physical products, the poultry industry requires some services. The lack of 24-hour clinics, online veterinary, and automatic alerts are the shortcomings of this industry. This study aims to reduce the occurrence of diseases in the poultry industry by providing online veterinary services.

Methods: online platform with 24-hour veterinary support was created. Information of 50 poultry farmers including farmer personal information and unit dimension information was collected and registered. The system was started with farmers' imported information about purchased broiler chickens like the day of arrival, given vaccines, and history of previous illness. Farmers find out how to disinfect the farm and the true time of using which vaccine and supplement with the system. Two veterinarians support farmers 24 hours a day for 60 days. Rate of the diseases compared with the previous period of farms with excel and pivot table.

Results and Conclusion: rate of microbial disease was greatly reduced compared to the previous period by 83%. This case can be justified in many ways such as there isn't any direct connection between farmers and centers of disease like pharmacies and medical offices or there isn't any disturbance in farms quarantine because all required products send to the farms without the involvement of individuals working in veterinary medicine. Reflecting the comfort of poultry farmers during the farming period is one of the theories. No difference was observed in metabolic disease ($p \leq 0$) since the system was not involved in the purchase of feed and chicken. The created system should be improved by matching laboratory results like HI test, antibiogram test, and other tests with predetermined programs. Finally concluded that poultry farmers are more successful in dealing with a microbial diseases with online veterinary services.

Keywords: Knowledge-based enterprises, online services, disease, veterinarian support,poultry industry.

Report of sero monitoring of ndv and aiv (h5n1 and h9n2) of ostrich chicks breeding unit of urmia city

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Background and Aim: Ostrich breeding centers are new job creation potentials in urmia city and at the moment a different types of ostrich farms included breeders, meat type and chickens under 3 months are active, an unfamiliar syndrome with recumbence, depression and leg problems reported in one breeding farm.

Methods: So due to clinical sign a wide serological study for probable ND and AI were done and 10% of existed population were selected for blood sampling., The technical methods for NDV and AIV were the HI and for correspondence used ELISA for serology.

Results: The advantages for ND showed that there is not any protective titer in the population and no any regression intra and inter a field. In H5N1 titration, fortunately no any immunoglobins were active so they were free of H5N1(it was expected due to Iran is free of H5N1), but for H9N2 the titers were very various. More than 68 % have not any titer and in the next 32% the titer was variable from 2 to 5.

Conclusion: Based on this study all of the farms recommended for NDV vaccination and H9N2
vaccine injection.

Keywords: AI, ND, Ostrich chick, Urmia

Production and Isolation ofAnti –progesterone Antibody from Avian Egg Yolk

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Objectives: Egg yolk is a good source of highly specific antibodies against mammalian antigens because ofthe phylogenetic distance between birds and mammals..Development of enzyme-linkedimmunoassays for progesterone depends on the ability to produce progesterone derivatives(haptens) that can be bound to proteins (carrier) while retaining enough of the originalprogesterone structure so that antibodies produced will recognize the native steroid.
Materials & Methods: In thisstudy was an optimized method designed for producing high yield derivative ofprogesteroneocarboxymethyl oxim and the results were compared with classic methods . These derivativeshave been analyzed and characterized by their thin layer chromatography (TLC), HighPerformance Liquid Chromatography (HPLC), ultraviolet(UV-vis) and infrared spectra(FTIR),This product can then be conjugated to bovine serum albumin in the presence of water-solublecarbodiimide to yield an excellent immunogen , analyzed using UV absorbance, SDS-PAGE andELISA,methods respectively In order to production of polyclonal antibody against progesteronehens immunized with progesterone-BSA and the titer of produced antibody determined by anindirect Elisa assay .
Results & Conclusion: The result of ELIA revealed that the titer of antibody is favorite after secondinjection. The eggs of the immunized hens are collected, the yolk is separated from the eggs,followed by separation of the lipid content of the yolk by water dilution under acidic conditions,Produced antibody was purified by polyethylene glycol precipitation and then anti BSA antibodywas separated by affinity chromatography with BSA ligand. the purified antibody was confirmedby ELISA and SDS-PAGE.The purity of IgY could reach 90%, and the recovery of IgY couldreach 81%.

Key words:progesterone,egg yolk,antibody,conjugate,purification,affinity chromatography

Impact of different levels of oak acorn (*Quercus brantii* Lindl.) as an alternative to antibiotic growth promoters on growth performance, small intestine morphology, and immune responses of broiler chickens

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Objectives: This experiment was desighned to evaluate the effect of different levels of oak acorn (*Quercus brantii* Lindl.) as an alternative to in-feed antibiotics (IFA) on growth performance, carcass characteristics, small intestine morphology and humoral immune responses in broiler chickens.

Materials & Methods: Three hundred, 1-d-old mixed-sex broiler chicks (Ross 308) were allocated to 5 groups for 6 wk. The dietary treatments consisted of a corn-soybean basal diet as a control, control + 2 mg lincomycin/kg, or control + 10, 15 or 20 g oak acorn/kg. Performance parameters were measured at different growth periods. At termination of the experiment two broilers/replicate were chosen based on the average weight of the group and carcass traits were determined. Intestinal morphology including villus height (VH), crypt depth (CD) and VH to CD ratio (Vh/Cd) were measured at the end of experiment. Antibody titers against Newcastle disease virus (NDV), and avian influenza virus (AIV) were measured.

Results & Conclusion: Dietary supplementation of lincomycin or 10 g oak acorn/kg significantly ($P < 0.05$) enhanced final body weight of broilers at 42 d. Overall daily feed intake during the trial was higher ($P < 0.05$) in broilers fed diets containing lincomycin or different levels of oak acorn compared with broilers fed basal diet. During the whole experiment feed:gain was significantly ($P < 0.05$) better in broilers fed basal diet or basal diet supplemented with 10 g oak acorn/kg compared with other treatments. Carcass yield was significantly ($P < 0.05$) higher in broilers fed diets containing 10 g oak/kg compared with other groups. In duodenum, broilers fed diets containing antibiotic or 10 g oak acorn/kg had significantly higher Vh/Cd compared with other groups ($P < 0.05$). In jejuna and ileum the highest Vh/Cd obtained in broilers fed diets containing 10 g oak acorn/kg ($P < 0.05$). Supplementation with 10 g oak acorn/kg led to higher antibody titers against NDV, and AIV ($P < 0.05$). In conclusion, the findings showed that supplementation of 10 g oak acorn/kg could induce favorable influences on growth performance, morphology of small intestine and immune responses of broilers and it could be consumed in broiler diets as a substitution for IFA.

Keywords: Broiler, carcass characteristics, immunity, oak acorn, performance.

Comparisons of molting diets on intestinal morphometric parameters and performance of commercial laying hens

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Objective: The complete removal of feed for several days is a common method for molt induction of commercial birds. However, there is growing concern regarding feed removal and animal welfare issues. Also the use of feed withdrawal for molt induction can negatively affected the structure and microbial environment of intestine and lead to greater intestinal colonization by salmonella infection. With this mind, alternative diets have been developed to produce similar molting effects as that of feed deprivation.
One of these methods is the use of low energy diets. Palm kernel meal contains large amounts of non-starch oligosaccharide such as mannose and galactomannan. The aim of the present experiment was to determine the effects of palm kernel meal as a high fiber ingredient and zinc element as an appetite repressive for molt induction compared with conventional methods on intestinal morphometric characteristics and performance of commercial laying hens.

Materials and methods: In this experiment 144Hy-line (W36) laying hens aged 74 weeks in a completely randomized design with 4 treatments and 6 replicates were used. The using treatments for 12 days molt period were included:1- control group (hens fed with a layer diet, FF) 2- feed withdrawal group (FW), 3- laying hen diet containing 20000 mg zinc oxide/kg (Zn), 4- laying hen diet diluted by adding 90% palm kernel meal (P90). At the end of molt period (day 12), 2 birds in each replicate were sacrificed for sampling from all three region of intestine.Performance of birds was monitored for 12 weeks after the end of the molting period.

Results and conclusions: Feed withdrawal hens had the lowest villus height and villus index among the experimental groups in all three regions of the intestine($P<0.05$).The surface area of the intestinal villi in the jejunum and ileum regions was higher in the control and P90 groups than in feed withdrawal group ($P<0.05$). The number of goblet cells was highest in birds fed with a diet containing palm kernel meal and the lowest in birds deprived of food ($P<0.05$). The means of egg mass in P90 group was significantly higher than feed withdrawal and control treatments ($P<0.05$). The best feed conversion rate (FCR) was seen in the P90 group ($P<0.05$). The results of this experiment showed that use of palm kernel meal-riched diet for molt induction of laying hens lead to improvement of morphometric characteristic of intestine and post molt performance.

Keywords: Molting, Palm kernel meal, Villus, Goblet cell, Laying hens

Development and Validation of a One-Step Real-Time PCR Assay for Detection of Subtype H5 Avian Influenza Virus

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Between the different hemagglutinin (HA) subtypes of avian influenza (AI) viruses, H5is important because of the serious consequences for the poultry industry and the increasing frequency of direct transmission of it viruse to humans. The availability of new tools to rapidly detect and subtype the influenza viruses can enable the immediate application of measures to prevent the widespread transmission of the infection. In this study, a novel one-step real-time reverse transcription PCR (RRT-PCR) was developed to detect the H5 subtype of AI viruses from clinical samples of avian origin. The specificity of the primer/probe sets was tested on nucleic acids extracted from a diverse array of microorganisms that may be naturally present in samples of avian origin. The sensitivity of the RRT-PCR assay was determined by using in vitro-transcribed RNA and 10-fold serial dilutions of titrated AI viruses. High sensitivity levels were obtained, with limits of detection ranging from 101 to 103 RNA copies and from 101 50% egg infectious dose (EID50)/100 µl to 102.74 EID50/100 µl with titrated viruses. Excellent results were achieved in the intraand interassay variability tests. The comparison of the results with those obtained from the analysis of 45 avian samples by means of the reference method (virus isolation [VI]) showed a high level of agreement. The repeatability of the H5 RRT-PCR assay was determined using three different concentrations (high, medium, and low) of viral subtype tested. The coefficients of variation within runs (intra-assay variability) ranged from 0.12% to 2.64%. The interassay variability was in the range of 2.76% to 4.06%

Key words : H5 Avian Influenza virus, Realtime RT-PCR, Detection

The effects of wheat-based diet compared to corn-based diet on the growth performance in Japanese quail

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Objectives: The purpose of this study was to determine the effects of wheat-based diet compared to corn-based diet on the growth characteristics and some blood parameters in Japanese quail.
Materials & Methods: Ninety six one-day-old Japanese quail were randomly divided into the following four groups with three replicates: corn -based diet without addition (group I),wheat -based dietwithout addition (group II), wheat-based diet plus 0.4% phytase (Group III), and group IV, wheat-based diet with the addition of 0.4% phytase and 0.07% xylanase enzyme. All groups were kept at standard temperature and with free access to food and water until the end of the experiment. Feed consumption, body weight and FCR were measuredweekly. At 35th day of age, 3 quail from each replicate were randomly selected and blood was collected from their jugular vein. The prepared serum samples were kept in a freezer at -20°C until the determination of malondialdehyde (MDA) and nitric oxide (NO).sera were placed in a freezer at -20°C until measuring the concentration of malondialdehyde and nitric oxide.
Results & Conclusion: The results of this study showed that the use of enzymes in wheat-based diets can improve food consumption in quail, although it was not statistically different($P>0.05$).The results also showed that FCR was higher in group II compared to group I, but there was no significant difference in FCR in the enzyme receiving groups compared to group I. The results of measuring the serum concentration of malondialdehyde showed that in the groups receiving the enzyme; thisamountfor MDA decreased significantly in comparisonwith groups II and I($P<0.05$). The measurement of serum nitric oxide also showed that the level of NO was lower in group II compared to group I; Although this difference was not significant between different groups receiving wheat (groups II, III and IV).
In conclusion, the data of this study indicated that the addition of enzyme to wheat-based diets can improve growth performance and blood parameters in quail.

Keywords: Corn-based diet, Wheat-based diet, Phytase enzyme, Xylanase enzyme, Japanese quail

Influence of Piriformospora indica plant-specific fungus as a new feed additives and clove essence on bacterial population of cecum after oxidative stress in broiler

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Objectives: The aim of this study was to evaluate the effects of dietary Piriformospora indica (PI), and clove essence (CE) and combination of them (synbiotic) on bacterial population of cecum after induction stress by dexamethasone.

Materials & Methods: The experimental was performed with 320 male, one-day-old chicks (Ross 308) were fed completely randomly in 8 experimental groups and 5 replications and in each replication 8 chickens were fed with corn and soy-based diets and experimental groups included group 1: control diet (based on corn and soybeans without any feed additives), group 2: control diet with 0.2 cc dexamethasone injection, group 3: control diet with 11.6 cc CE, group 4: control diet with 10 mg PI, group 5: control diet with 11.6 cc of CE with 0.2 cc injection of dexamethasone, group 6: control diet with 10 mg PI and injecting 0.2 cc of dexamethasone, group 7: control diet with synbiotic contains: 10 mg of PI combination with 11.6 cc of CE, group 8: control diet with synbiotic contains:10 mg of PI and 11.6 cc of CE with 0.2 mg of dexamethasone injection. PI and CE were poured into chickens' water, during the raising period. After 31, 33, 38 and 40 days, 2 mg/kg BW of dexamethasone was injected in right breast muscle of experimental groups 2, 5, 6 and 8 in all replications, and after 35 and 42 day, samples were taken.

Results & Conclusion: Resulte that showed the decrease of salmonella, coliforms and, E.coli population in caca in synbiotics group (t7), and the bacterial population increased in dexamthason group (t2). This study showed the dexamthason increased bacterial population and, symbiotic decreased bacterial population of cacum.

Keywords: Broiler, Clove, Microbial, Piriformospora Indica.

The effect of Piriformospora indica and clove essence on pH of digestive tract and intestinal length after oxidative stress in broiler

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Objectives: The aim of this study was to evaluate the effects of dietary Piriformospora indica (PI), and clove essence (CE) and combination of them (synbiotic) on pH of digestive tract and intestinal length after oxidative stress in broiler.

Materials & Methods: The experimental was performed with 320 male, one-day-old chicks (Ross 308) were fed completely randomly in 8 experimental groups and 5 replications and in each replication 8 chickens were fed with corn and soy-based diets and experimental groups included group 1: control diet (based on corn and soybeans without any feed additives), group 2: control diet with 0.2 cc dexamethasone injection, group 3: control diet with 11.6 cc CE, group 4: control diet with 10 mg PI, group 5: control diet with 11.6 cc of CE with 0.2 cc injection of dexamethasone, group 6: control diet with 10 mg PI and injecting 0.2 cc of dexamethasone, group 7: control diet with synbiotic contains: 10 mg of PI combination with 11.6 cc of CE, group 8: control diet with synbiotic contains:10 mg of PI and 11.6 cc of CE with 0.2 mg of dexamethasone injection. PI and CE were poured into chickens' water, during the raising period. After 31, 33, 38 and 40 days, 2 mg/kg BW of dexamethasone was injected in right breast muscle of experimental groups 2, 5, 6 and 8 in all replications, and after 35 and 42 day, samples were taken.

Results & Conclusion: The result of pH of digestive tract that showed, n group has a significant effect on the pH of digestive tract. In length of intestine, the symbiotic group (t7) increased the length of deudenum, jeujenum and, ileum, and dexamthason group(t2), decreased them. This study showed the dexamthason decreased intestinal length and, symbiotic increased the intestinal length.

Keywords: Broiler, intestinal length, pH of digestive tract, Piriformospora Indica.

A case report of Advanced Granulomatous Mycosis of Respiratory tract in a Green-cheeked Parakeet

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We present a case of 3-year- old Green-cheeked parakeet with symptoms of lethargy, loss of appetite and clinical signs of advanced stage of chronic respiratory illness that had been referred to the diagnostic imaging center.

Two standard orthogonal Lat and VD projections from coelomic cavity were performed.Radiographic examination showed nonhomogeneous, compacted lungs and airsacs, rounding of the caudal edges of the lungs, and air trapping .A region of radiodense compacted nonhomogeneous concretion in the cranioventral area of the right lung was evident.

As a result of granuloma formation, mycotic lesions often appear as irregular patches in the lung field of varying sizes on traditional radiographic images. A lack or inadequate visualization of the main bronchus may be observed in avian patients diagnosed with severe mycotic infection causing a compensatory dilation of the secondary bronchi. Lung tissue in which there are focal areas of calcification are nonspecific signs of chronic, usually infectious disease that can be observed using both radiographic and CT imaging modalities.

In this presentation according to clinical symptoms, radiographic observations and laboratory results , severe advanced granulomatous mycosisof the respiratory tract was diagnosed.

For further studies, CT diagnostic imaging could be recommended.

Key words: Mycosis, Lung ,Radiology, Green-cheeked parakeet

References: Junghanns, M. E., Pees, M., Reese, S., Tully, T. (2011) Diagnostic Imaging of Exotic Pets. Deutsche National bibliography (pp.93-95). Germany.

A case report of Metacarpal bone Squamous Cell Carcinoma in a Cockatiel

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A case of 7-year -old cockatiel with appearance of a large massive soft tissue swelling associated with pain and avoiding right wing movementwas referred to the diagnostic imaging center.

Two standard orthogonal Lat and Cr-Cd projections of right wing were performed. Radiographic examination showed a large massive soft tissue swelling at the level of right middle of metacarpal bone. Decreased bone opacity and areas of osteolysis within the right distal limb was present. An area of mis alignment as a pathologic fracture with no evidence of periosteal reaction involved the affected bone. No sign of productive lesions through the affected limb was detected.

Squamous cell carcinoma can become clinically evident due to massive soft tissue swelling and the potential occurrence of pathologic fractures; however, there is little osteolytic reaction observed. The presence of a periosteal reaction is often interpreted as being characteristic of a malignant bone tumor, especially when the periosteal reaction with nonneoplastic new bone is viewed in the radiographic image.

In our case study due to the clinical symptoms, radiographic findings, and also according to results of histopathologicalexamination, squamous cell carcinoma in the region of right metacarpal bone was diagnosed.

For further studies, fine needle aspiration and core biopsy from the massive soft tissue was performed.

Key words: Carcinoma, Metacarp, Radiology, Cockatiel.

References: Junghanns, M. E., Pees, M., Reese, S., Tully, T. (2011) Diagnostic Imaging of Exotic Pets. Deutsche National bibliography (pp.70-71). Germany.

The efficacy of fenbendazole (anthelmintic drug) in native fowl in city of rasht

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BACKGROUND: Parasitic diseases are common in rural chickens due to scavenging habits in free range. Treatment of these infection is extremely varied.Fenbendazole as anthelminthics drug is used for gastrointestinal helminth of poultry.

Materials & Methods: This study is designed to evaluate the efficacy of fenbendazole in 62 domestic chickens. Three flocks were selected around the city of Raht. Chickens of each flock were divided into 1 treatment groups and control group. Afterward, fecal samples were taken from every chickens and number of eggs per gram of feces (EPG) were determined by using Clayton-Lane method. Then,fenbendazole (5mg/kg for 3 continuous days) was orally given to the treatment group, while control group did not receive any anthelminthic drug.After 14 days, fecal samples were obtained again from chickens and EPG determined, where efficacy of anthelminthic drug was evaluated.

RESULTS: Mean EPG in intervention group before and after treatment was determined to be 183.3 and 100.35, respectively. Overall, the mean efficacy of fenbendazole was calculated as 51.61%.Furthermore, weak and suspicious efficacy was obtained as 11.76% and 35.29%, respectively.

CONCLUSIONS: Based on the findings presented herein, a decrease level of efficacy was determined for Fenbendazole

Key words: Fenbendazole, Efficacy of anthelmintic drug, Domestic chicken, Rasht, EPG

Infestation rate of native poultry with red mite (*dermanyssusgallinae*) in Tabriz city

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BACKGROUND: In this study, the infection rate to *Dermanyssusgallinae* of native and semi-industrial poultry in Tabriz city was evaluated .

Materials & Methods: This study was conducted from April 1399 to March 1400 by collecting samples from the city of Tabriz. The total number of the samples was 240, of which 120 were chicken and 120 were rooster in different ages. For microscopic examination of isolated mites, 10% potassium digestion was used.

RESULTS: In this study, the rate of poultry contamination of this city was 57/91%, of which the most infected were poultry over 1 year old. There was no significant difference between the sexes of the birds in the level of infection by *Dermanyssusgallinae.*

CONCLUSION: The high rate of infection of birds to this mite reveals the importance of controlling and preventing, among native poultry in the city.

Keywords: *Dermanyssusgallinae*, native poultry, Tabriz, Mite, Poultry

Treatment of Hypocalcemic Syndrome in An African Grey Parrot: A Case Report

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Objectives: African Grey Parrot (*Psittacus erithacus*)is an exotic pet bird and one of the common species of birds, which is likable in many parts of the world. Central and West parts of Africa is the origin ofthese parrots.African grey parrots' diet in wildlife and their natural habitat includes a variety of seeds, nuts, fruits, berries andvegetation in the wild. When kept as a pet, diet, welfare, the experience and knowledge of the bird's owner is quite critical for a healthy long life of the bird. Hypocalcemic syndrome is a life-threatening disorder in AGPs. Clinical symptoms of this syndrome include: neurological disorders with periodic seizures, tetany andshivering. During the onset of disease's signs, the serum ionized calcium level is usually less than 6.0milligrams in deciliter(mg/dl) of blood.

Materials & Methods: On November 14th 2020, an African Grey Parrot was submitted to the Hospital of Pet Animals (Faculty of Veterinary Medicine,University of Tehran) with a history of falling from thesitting perch and periodic seizures. History-taking reveals that the parrotwas fed only with pistachios and sunflower seedand the bird has no accessto sunlight. Also,it was observed that vast parts of plastic waterer and feeder were chewed by the bird and large amounts of feces were accumulated in the cage.The bird's condition was very concerning and needed to be stabilizedimmediately. At first, Parenteral serum therapy with an infusion fluid containing amino acids, vitamins and electrolytes (Duphalyte®, Zoetis™, US), oxygen therapy andsufficient body heat were provided. After emergency treatments, blood samples were taken and referred to laboratory in order to check hematological and biochemical markers. The parrot was put on a commercially balanced diet for the next weeks and the owner were informed with parrot care basics. In addition, calcium and other minerals supplement and multivitamins were prescripted. The aforementioned bird was followed up for any signs of neurological signs in the next weeks after reference.

Results & Conclusion: Laboratory results confirmed hypocalcemia besides other electrolytesdeficiency and imbalance, which led to neurological signs.Using laboratory as a tool in diagnosis of diseases in exotic pets could be very beneficial. Nurturing parrots with a diet consist of nuts only, would results in nutritional deficiencies. Diet correction and use of multivitamin and mineral supplements is the main treatment of Hypocalcemic syndrome in African Grey Parrots.

Keywords: African Grey Parrot, Hypocalcemia, Neurological Disorders, Nutritional Deficiencies, Seizure

Polymelia(Six hind limb) in a mature Iranian native chicken

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Objectives: Limb malformation is one of the most frequent anomalies in different animal species. " Polymelia" is a kind ofthese malformations that has various types based on the location of the supernumeraryorgans'attachment.Polymeliahas been reported in humans, mice, chickens, calves, and lambs. however, this abnormality has been seldom reported in different species of birds.This report herein describes a hind limb anomaly that has been observed in the Iranian native chicken.

Materials & Methods: In this report, a female layer Iranian native chicken with a congenital anomaly of the hind limb has been investigated. Initially, the connection among the anomalous parts and other anatomical structures was examined through dissection process. Subsequently, the carcass's skin and the viscera were removed. Bones separation was done using the insect technique and fat removal process and bleaching of the bones were performed afterwards.

Results & Conclusion: The right hind limb was naturally available in this case with no signs of malformations, yet the Tibiotarsal bone in the left hind limb was anomalous. This bone had one proximal extremity and no abnormalities were observed in the proximal part of the bone's body, however, it was divided into two parts form the medial part of the bone's body to the distal side and each of the divisions was ending to separated distal extremities. Following that, a complete structure of a distal part of the hind limb – containing Tarsometatarsal bone and phalanges –was jointedto each of the distal extremities of the Tibiotarsal bone. Moreover, some structures were attached to the caudal part of the pelvic bones.No problemwas observed in the right bones, but in the caudal border of the Ischium and the apex of the Pubis, an abnormal osseous structure was fused that was formed by the fusion of two defective Femurs.Two Tibiotarsal bones had been fused to this osseous structure, and a complete structure of a hind limb was articulated to each of them.

With regards to the shape and number of the supernumerary limbs, the reported malformation in this article is a rare case of Polymelia in chicken. In the embryonic development of the terrestrial vertebrates, the most identified condition is the formation of four limb buds. These abnormalities may occur due to genetic causes or as a result of unfavorable hatching conditions.

Keywords: Anomalies, Polymelia, Iranian native chicken, Hind limb

Infection status of laying hens of industrial poultry farms in Alborz province to red mite (Dermanyssusgallinae)

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Red mite is the most important external parasite of laying hens and industrial hens in Europe and

Iran. Mite infestations have devastating effects on poultry health and welfare, causing significant economic losses, and in addition, D. gallinae is often considered a vector of pathogens, transmitting viral agents such as fowl pox virus. It has been proven through this parasite.

Although the prevalence of Salmonella has decreased rapidly since the early 2000s, Salmonella is still present in commercial poultry and causes significant economic losses. There is growing concern about the emergence of new pathogenic strains of Salmonella gallinarum that are able to overcome vaccine immunity. It is also believed that the poultry red mite, Dermanyssusgallinae, which is commonly found in layer chicken farms, can be an important reason for the recurrence of Salmonella disease in farms.

Key word: redmite,hen,, Dermanyssus gallinae

Evaluation the effect of broccoli powder (*Brassica oleracea var. italica*) in comparison to vitamin C on the antioxidant status and the incidence of pulmonary hypertension syndrome in broiler chickens

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Objectives: The aim of this study was to evaluate the incidence of pulmonary hypertension syndrome in broiler chickens fed with diets containing broccoli compared to vitamin C.
Materials & Methods: A total of 144 broiler chicks were randomly divided into 4 groups with 36 birds. Each group had 3 replicates with 12 birds in each replicate. Group 1 received standard ration of broiler chickens. Group 2 was fed with a diet containing 500 mg/kg of vitamin C. Groups 3 and 4 respectively received diets containing 1 and 0.5% of broccoli powder. The variables related to organs weight, total antioxidant capacity, lipid peroxidation, blood parameters and serum biochemical factors, humoral and cellular immune response were evaluated. Results of RV/TV ratio in groups vitamin C and broccoli 1% were less than control and was statistically significant ($P<0.05$). H/L ratio decreased in treatment groups than control ($P<0.05$). Serum nitric oxide levels in the group broccoli 1% were higher than control ($P<0.05$). Serum triglyceride levels in group broccoli 1% was lower than control ($P<0.05$). Serum HDL-C levels at both broccoli groups were increased and Serum LDL-C levels decreased at both broccoli and these differences were statistically significant ($P<0.05$). PCV level, Serum cholesterol, uric acid and total protein in all treatments did not show any significant difference. Serum malondialdehyde levels were significantly lower in all treatments and total serum antioxidant capacity in vitamin C, broccoli 1 and 0.5%, were higher than control and statistically significant ($P<0.05$). Although antibody titers against SRBC and coetaneous hypersensivity reaction against PHA-P in treatments increased but were not statistically significant. Total mortality in the entire period of experiment were decreased in treatments compare to control, but was not statistically significant.
Results & conclusion: The present study showed that the addition of broccoli powder to broiler chickens diet with the improvement of antioxidant, increasing nitric oxide, decreasing blood lipid levels and RV/TV ratio and mortality can prevent ascites syndrome.
Keywords: Pulmonary hypertension syndrome, Broiler chickens, Vitamin C, Broccoli.

Gene expression of heat shock protein (HSP90) in the brain of cold induced pulmonary hypertensive chickens

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Objectives: The purpose of this study is evaluation gene expression of heat shock protein (HSP90) in the brain (hindbrain, midbrain and forebrain) of chickens with cold induced-pulmonary hypertension.

Materials & methods: The quantitative real-time PCR was done. Total RNA were extracted from forebrain, midbrain and hindbrain according to the acid guanidium thiocyanate-phenol-chloroform single-step extraction protocol. Total RNA were treated with RNase-free DNase to avoid amplification of contaminating genomic DNA. The level of HSP70 and beta actin transcript were determined by real time reverse transcriptase RT-PCR using sibber-green chemistry. Specific primer of HSP90 was designed with primer blast. PCRs were carried out in a real-time PCR cycler in three replicate for each sample of ventricle.

Results & conclusion: The ratio of the right ventricle to total ventricle (index of pulmonary hypertension in chickens) was increased in the cold induced-pulmonary hypertensive chickens at 42 days of age compared to control ($P<0.05$). The HSP gene was expressed in three parts of brain in two experimental groups. In the hindbrain and midbrain of cold induced-pulmonary hypertensive chickens, the relative gene expression of HSP90, was decreased compared to control ($P<0.05$), while in forebrain the expression of HSP90 did not change. Probably, up-regulation of HSP gene expression in the forebrain and midbrain delays the pathological process of cold stress whereas diminished expression of this gene in the hindbrain may affect its normal function at cardiovascular center and sympathetic nervous system to exacerbate pulmonary hypertension.

Keywords: Pulmonary hypertension, Broiler, Heat shock protein

Comparative evaluation of clinical features and therapeutic response of broilers with colibacillosis induced by intratratracheal and subcautaneous routes

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Objectives: The purpose of this study is to compare two different colibacillosis induction methods and response to treatment in chickens.
Materials & Methods: 125 broiler chickens at the age of 35 days were randomly divided into 4 experimental groups of and 3 control groups as follows: inoculated with the bacteria intratracheally (IT), intratracheally and received florfenicol (ITF), subcutaneously (SC), subcutaneously and received florfenicol (SCF), the control groups received sterile culture medium intratracheally (ITC), subcutaneously (SCC), and the negative control with no treatment (C).Clinical signs and mortalities were recorded daily, and dead birds as well as 5 euthanized birds were grossly examined on days 3 and 7, moreover; heart blood sampling was performed
.**Results:** Clinical signs were fully revealed after 12 hours of inoculation. The severity of clinical symptoms and also the deaths on the first and second day after the challenge showed the highest level in the treatment groups, especially the SCF, SC and IT groups. From the third day, clinical symptoms in the ITF group decreased noticeably, but the birds in the SC and SCF groups still showed severe clinical symptoms with continued deaths. The highest losses were in the SCF group and the lowest losses in the ITF group.Respiratory system lesions were observed from the first day and especially on the second day after challenge in the dead chickens of the IT and ITF groups, while these injuries occurred with a delay of 2 to 3 days in the SC and ITF groups. Kidney injuries in birds of SCF group was remarkable. In SC and SCF groups, euthanized birds had no pulmonary involvement. Renal involvement was observed in all birds of these two groups on day 3.Loss of body weight and increase in liver/body weight ratio on day 3 was noticeablein the subcutaneously challenged groups.The IT group showed an increase in lung/body weight ratio on this day. Smaller number of heart blood samples in the ITF group were positive for bacteria on day 3
.**Conclusion:**Different inoculation routes cause significant differences in clinical symptoms, necropsy injuries, and mortality rates in broiler chickens challenged with *E-Coli*. Kidney injuries are pronounced in birds inoculated by subcutaneous route, while birds challenged by the intratracheal method lesions in therespiratory system are remarkable. Response to treatment, as a criterion for the ideality of animal models, is better in the intratracheal challenge method than in the subcutaneous method.
Key words:*E-Coli*, broiler, model, florfenicol

Finding the Thermostable mutations and the additional N-glycosylation site within the Hemagglutinin-Neuraminidase gene of the Newcastle disease virus belonging to the VII.1.1 subgenotype

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Newcastle disease virus (NDV) is one of the most devastating avian pathogenic agents, causing a massive economic burden in poultry farms around the globe. The recent study was performed to gain deep insights into the phylogenetic and molecular analyses of the complete hemagglutinin-neuraminidase (HN) gene among NDV isolates.The collected samples from six different provinces of Iran (West Azerbaijan, Gilan, Mazandaran, Kerman, East Azerbaijan, and Golestan) during July 2017-February 2020 were utilized to conduct the phylogenic analysis.Identification of (a) the mutations S315P and I369V related to increasing the viral thermostability; (b) the additional N-glycosylation site (NIS) at position 144; (C) the cysteine residue at position 123; (d) amino acid substitutions in the HN antigenic sites, especially the mutations I514V and E347Q, as well as the other mutant within HN binding sites of the VII.1.1 subgenotype, seems to propose the idea that this novel subgenotype of NDV may have a high level of virulence and pathogenicity compared with other NDV subgenotypes. The N-linked glycosylation sites are known to be critical for some biological activity of proteins, such as correct folding, oligomerization, correct conformation, and disulfide bond formation. Previous investigations have urged that any shifts in the glycosylation sites of NDV might impact its biological procedures. The results demonstrate an additional N-glycosylation site at residues 144-146 (NIS), which may change the virulence of the isolates. Whether the new N-glycosylation site can affect the virulence of the virus or not should be further studied. In addition, it has previously been revealed that most NDV strains cannot tolerate the heat and will lose their virulent capability when they exposure to 50°C for 30 min. The results demonstrated mutations S315P, I369V, and V369A among the VII.1.1 isolates. Previously, it has been revealed that the residues 315, 329, and 369, especially mutations S315P and I369V, could notably improve the viral thermostability, NA, and HA activities.Thereby, finding the thermostable mutations (S315P and I369V) and the other amino acid substitutions within the VII.1.1 subgenotype isolates may lead to influenced vaccination results against this new NDV subgenotype.

Keywords: Amino acid substitutions, Broiler,Hemagglutinin-Neuraminidase, NDV, phylogenetic analyses, subgenotype VII.1.1.

The prevalence of flea infestation in industrial poultry flocks of rudsar city (gilan province)

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BACKGROUND: *Echidnophagagallinacea* (sticktight flea)has been found worldwide and served as an important flea of poultry. The flea is the cause of severe nuisance, irritation and allergic reactions in both animals and humans.Heavy flea infestation can cause severe anemia or even death in birds and sticktight flea are known vectors of deadly diseases such as the plague and murine typhus. They are also known to be intermediate hosts of dog tapeworms.

Materials & Methods: This study was carried out to determine the prevalence of this external parasite in industrial farms in the Rudsar city. In the present study, 54 industrial poultry units were examined. After collecting samples, the laboratory confirmed the diagnosis.

RESULTS: Results of the survey the samples in the laboratory have shown that 46% of the farms in the study were infected with *Echidnophagagallinacea*.

CONCLUSION: According to the results, and considering the importance of this external parasite in the transmission of pathogens, therefore a relatively highcontamination can be a serious risk in commercial chicken flocks of Rudsar city in Gilan province.

Keywords: Flea infestation, *Echidnophagagallinacea*, poultry, Rudsar, Gilan province.

Investigating the contamination of day-old broiler chickens with mobile Salmonella serogroup D in Behshah

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Purpose: The present study was conducted with the aim of the infection rate of one-day-old broiler chickens with mobile salmonella serogroup D in Behshahr city, infection with bacteria belonging to the genus Salmonella due to its ability to cause economic losses related to poultry farming on the one hand and endangering health. On the other hand, consumers of contaminated production products are very important. The importance of salmonella contamination of poultry and their products has expanded significantly in recent years. In the past, the main motivation to control salmonella infections in poultry was to reduce losses and economic losses caused by bird disease, while today public health and the demand of consumers to prevent the transmission of salmonella to humans through food as a necessity precedes other issues. It is important for producers of poultry products.
Materials and methods: In this article, 27 farms in Behshahr were randomly tested at the beginning of the hatching period. The casualties of these farms, which were generally between two and three days old, were collected and sent to the veterinary diagnostic laboratory. Savana was sent to Shahr. Sampling of chicken livers was done in three series of five in selenite F enrichment medium. After 24 hours of incubation, the samples were cultured in XLD selected medium and again after 24 hours of incubation. Suspicious strains were cultured in differential media to confirm the diagnosis.
Results: Out of 27 farms that were examined for salmonella detection, 8 farms were infected with motile salmonella and all salmonella isolated after agglutination with multilineage antisera belonged to serogroup D.
Discussion: Although various factors play a role in salmonella contamination of poultry, one of the sources of salmonella contamination is vertical transmission in mother flocks, which should be given more attention to produce salmonella-free one-day-old chickens.

Morphological Identification and Molecular characterization of *Eimeria* species Infection from commercial chickens farms of different parts of Iran

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Coccidiosis of domestic fowls, especially the domestic chicken (Gallus domesticus), is an economically important disease caused by any of seven species of Eimeria which by developing and multiplying within the epithelial cells of the intestine cause lesions therein.
We conducted a survey in chicken farms from different parts of Iran to establish prevalence and distribution of Eimeria species using single PCR assay. A total of 64 clinically confirmed complete intestinal samples were collected from different parts of Iran, in which 7 species of Eimeria spp. were identified by morphological methods: E. acervulina (17/64; 26.56%), E. tenella (31/64; 48.43%), E. maxima (12/64; 18.75%) , E. praecox (1/64; 1.56%), E. necatrix (1/64; 1.56%), E. mitis (5/64; 7.8%),E. mivati (2/64; 3.1%). Mixed infections were found in 10 (15.62%) samples. Five species were identified using molecular methods: E. acervulina (34/64; 53.12%), E. tenella (39/64; 60.93%), E. maxima (5/64; 7.81%), E. bruneti (5/64; 7.81%), E. necatrix (2/64; 3.12%).Eimeria spp. oocysts may be frequently detected in faecal samples from village chickens and the results of the present study suggested that Eimeria infection is widespread in chickens' farms, therefore, different integrated strategies should be performed to control infection in Iran.

Keywords*: Eimeria, Chicken, PCR, Iran.*

The effects of edible gelatin coating containing essential oil of caraway (Bunium persicum Boiss)on the shelf-life of chickenmeat in modified atmosphere packaging

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Objectives: Chickenmeat is prone to contamination and spoilage due to its composition and production. Therefore, in order to extend its shelf life, the use of antioxidant and antimicrobial compounds has always been the focus of researchers' attention .The present study was conducted to evaluate effects of ediblegelatin(4%) coating containing Caraway (Bunium persicum Boiss) essential oil (2%) on the shelf-life of meat in modified atmosphere packaging at refrigerated storage.

Materials & Methods: The chicken meat samples were separated into three groups uncoated (control), treated with gelatin coated without Caraway (Bunium persicum Boiss)essential oil and immersed in gelatincoated with Caraway (Bunium persicum Boiss) essential oil.Then Samples were packed in MAP (80% O2 and 20% CO2) conditions and stored at 4 °C up to 15 days and evaluated periodically (on days 0, 3, 6, 9, 12, 15and 18) for microbiological (mesophilic and psychrotrophic), chemical (pH, TBA and TVN) and sensory (external aspect, muscular elasticity, odor and color) characteristics. Microbial analysis indicated that coating had significant influence ($p<0.001$)on reduction of trends of psychrophilic and mesophilic bacteria with the minimum shelf life of 6 and 9 days respectively. From the aspects of chemical factors, the containing gelatincoated with Caraway groups showed lower pH, TBA and TVN than those without coating.Also, the amount of TBA in gelatinCaraway (Bunium persicum Boiss) and Caraway (Bunium persicum Boiss) treatments were significantly lower than the other two groups ($p<0.001$).About the sensorial factors, the gelatin-Caraway and also Caraway treatments, could keep the sensorial attributes in acceptable level for 12 and 9 days respectively. According to the results,gelatin coating significantly improved ($P<0.05$)quality of samples.

Results & Conclusion: This study indicated that the effect of gelatin containing Caraway (Bunium persicum Boiss) essential oil on samples was to retain their good quality characteristics and extend the shelf life of chicken meat during refrigerated storage, which was supported by the results of microbiological, chemical, and sensorial properties.

Keywords: Caraway (Bunium persicum Boiss), chicken meat,Modified atmosphere, gelatin coating

Determination of T-2 toxin in poultry feedsin Shahrekord province,Iran

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Objectives: T-2 toxin is the most toxic type A trichothecene mycotoxin. It is the secondary metabolite of the Fusarium fungi, and is common in grain and animal feed.It has been implicated in several outbreaks of human mycotoxicosis.Toxic effects in poultry include inhibition of protein, DNA, and RNA synthesis, cytotoxicity, immunomodulation, cell lesions in the digestive tract, organs and skin, neural disturbances and low performance in poultry production (decreased weight gain, egg production, and hatchability).

Materials & Methods: In this study, 80 samples were taken consecutively and randomly from four differentpoultryfeedsin feedstufffactoriesof Shahrekord province in 1400 and transferred to the quality control laboratory. Samples were analyzed for T-2 toxin contamination by the ELISA method.

Results & Conclusion: All samples of poultry feeds were more or less contaminated with T-2 toxin but the amount did not exceed the permissible limit. Mean contamination of chick starter and grower feed was 11.2±2.3 and 13±2.7 µg/kg, respectively. Regarding finisher feed, mean of contamination was 14.5±4.6 µg/kg and for the layer feed was 12.6±2.2 µg/kg. There was no significant difference between four different poultry feeds. Although the amount of contamination is less than the safe limit, this toxin causes different diseases in animals. Therefore, potential transfer of mycotoxins to edible by-products from animals fed mycotoxin-contaminated feeds drives the need to routinely monitor mycotoxins in animal feeds and their components. This is the basis on which effective management of mycotoxins and their effects can be implemented.

Keywords: T-2 Toxin, Poultry feeds,Shahrekordprovince, Iran

Identification and control of acute Newcastle disease virus with Mycoplamosis in a pigeon flock, Tehran

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Objective: Newcastle disease is a contagious viral disease affecting birds e.g. pigeons. The disease is caused by certain strains of avian Paramyxovirus serotype 1 virus. Biosecurity has the vital role in poultry industry to prevent the pathogens and vectors like wild birds into the farms specially in feed warehouses. Wild birds are so significant mechanical vectors for Newcastle disease virus (NDV) to spread the virus. The description of acute NDV that prevalent in Iran can increase the veterinarian knowledge's in about the disease. The information can help to better control of this contagious disease.

Material and method: A pigeon flock (2000 birds) with high mortality (200 birds) after 12 days were examined clinically and with necropsy for primary diagnosis. Neurogenic and viscerotropic of NDV were suspected. There were typical symptoms of Newcastle disease such as twisting of the neck and green-watery diarrhea in the flock. 20 birds with twisting of the neck and eye sinusitis were selected to send to laboratory for Hemagglutination inhibition (HI) and Antibiogram test. After receiving the laboratory report, flock were vaccinated with Clone-30 vaccine via drinking water and followed with vitamin B-complex as supportive treatment. Also, to cure secondary infection was prescribed the combination of Doxycycline plus Erythromycin in drinking water (with dosage of 1cc of each antibiotic simultaneously per 1 lit water) up to 5 days.

Results and conclusion:

Regarding the clinical signs typically worsen within 72 hours to include lethargy, loss of appetite, loss of weight quickly as typical sign of Mycoplasmosis, diarrhea, nasal discharge, twisting of the neck and eye sinusitis with positives samples in HI test (Mean Titre: 7.41 and CV: 29%) has been clarified the presence of NDV in this flock. After 4 days from prescription of vaccine with Clone-30 the mortality rate was finished and controlled. Moreover, the result of antibiogram test was helpful to select the effective antibiotics to cure the secondary infection. This study indicated the presence of NDV in pigeon flocks in Tehran.

Keywords: Newcastle diseases, HI titre, Neurogenic, viscerotropic, Velogenic, Mycoplasmosis, Biosecurity, Pigeon flock

Serological evaluation of Razi Ornithobacterium Rhinotracheale inactivated Vaccine in Broiler Breeder

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Objectives: In the present study, the efficacy of the first Iranian inactivated ORT vaccine produced by the Razi Vaccine and Serum Research Institute was evaluated in broiler breeder farms of west Azerbaijan province of Iran.

Materials & Methods: Nine broiler breeder flocks were chosen to evaluate Razi inactivated ORT Vaccine (serotype A, strain banani32). blood samples were collected 1weeks before vaccination also 4, 8, 12 and 20 weeks after vaccination.Serum sample gatheredto determine antibody titer with IDEXX ORT ab kit (IDEXX Laboratories, Inc., USA).three out9 flocks showed initial antibody titers against ORT (challenge with field strain), therefore only six flocks were vaccinated. Among these six flocks 3 flocks received vaccine two time (8 to 10 and 16 to 18 weeks) while 3 flocks receivedvaccine once (8 to 10 weeks).

Results & Conclusion: The mean antibody titer obtained 4 weeks after vaccination with one injection using the ELISA test was equal to 5680, while twice vaccination showed 8850 antibody titers. Serum results obtained from vaccination with the inactivated Razi ORT vaccine in six broiler breeder farms showed that vaccination is necessary to immunize breeding flocks while two injections of killed vaccine gives higher antibody titer and better titer uniformity.It seemed that vaccination could be an efficient planto protect susceptible birds, decreasing variation in anti-ORT antibodies titers and induction persistent antibody titer. However, challenge experiments need to be carried out to define vaccination efficacy against challenges.

Keywords:Ornithobacterium rhinotracheale, Vaccine, ELISA titer, Broiler breeder, Antibody

Evaluation of the *Cryptosporidium* infection in ostriches of a breeding farm in Dehgolan, Kurdistan

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Objectives: Ostriches are currently known as the world's biggest birds with several exclusive capabilities including resistance against infectious diseases and the production of good quality meat. Regarding this, raising ostriches have been increased in different provinces in Iran during last two decades. However, the evaluation of the parasitic infections in ostriches have been done ocassionally in some parts of Iran. Thus the present study was done to assess the prevalence of the zoonotic protozoan, *Cryptosporidium*, among 150 ostriches in the largest breeding farm in Dehgolan, Kurdistan province, using fecal floatation, slide preparation, Ziehl-Nielsen staining and microscopic examination.

Materials & Methods: This study was conducted on150 ostriches in the largest breeding farm in Dehgolan, Kurdistan province, using fecal floatation, slide preparation, Ziehl-Nielsen staining and microscopic examination.

Results &Conclusion: The results of the present study showed a mean prevalence of 10% regarding *Cryptosporidium* spp. infection, while no statistically significant association was reported between the prevalence and the sampling season (P = 0.671). Based on our results, implementation of additional studies such as parasite typing, in order to determine the zoonotic significance of the isolates, as well as improving management procedures are recommended.

Keywords: Ostrich, *Cryptosporidium*, Kurdistan, Ziehl-Nielsen, Iran

Risk Factors for Dead on Arrival and Abattoir Condemnation of Broiler Carcasses in Shiraz County

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Objectives: In this study, the consequences of loading, transportation and pre-slaughter stages on the condemnation rate of broilers in slaughterhouse were investigated.

Materials and methods: In the present study, over a 1-year period, one of the poultry slaughterhouse in Fars province were visited for the evaluation of Loading, transportation and pre-slaughter process and their relation with the number of dead on arrival birds, the condemnation rate and some of the condemnation reasons.

Results and discussion: From the evaluated factors, slaughter weight was significantly related with weight loss and wing fracture percentages ($P \leq 0.05$). Warm and cold seasons had not significant effects on overall condemnation rate ($P > 0.05$). However, cachexia was significantly higher in the warm seasons and pododermatitis and bruising were significantly higher in cold seasons ($P \leq 0.05$). The relation of weight loss and different slaughter related factors showed that weight loss was significantly related with slaughter weight, farm to slaughter distance, farm to slaughterhouse time, and final loading to slaughter time ($P \leq 0.05$). Dead on arrival rate was significantly related to the transportation time ($P \leq 0.05$). Number of birds in each transportation crate and crop status had not significant effect on the slaughter factors ($P > 0.05$).

Conclusion: This study showed that season, slaughter weight, transportation distance and time was effective factors on dead on arrival and condemnation loss.

Key words: Broiler Chicken, Dead on Arrival, Risk Factors, Slaughterhouse Carcase Rejection

A comprehensive study on lameness in the broiler chicken farms of Shiraz County

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Objectives: Considering the high rates of lameness in broiler farms of Fars province, a detailed study was designed to evaluate the main reasons of this problem.

Materials and methods:For this reason, the birds from 10 broiler flocks with clinical lameness and three normal flocks, were externally evaluated and blood was taken for serum parameters.After euthanizing, necropsy findings, bacteriological evaluation, radiologic bone densitometry and histopathology findings of leg bones were evaluated. In addition, serum and bone mineral contents and serum vitamin D3 and Parathyroid hormone (PTH) were measured in lame and normal birds. Finally in an experimental study, septic arthritis was induced by the injection of one the isolated and identified staphylococcus aurous in tibiotarsal joint and the effect of prophylactic vitamin C administration alone or in combination with sulfadiazine-trimethoprim (SDT) or florfenicol (FF) were evaluated.

Results and discussion: Gross lesions in lame birds showed that 52 % of these birds suffered from femoral head necrosis. Valgus/Varus and hock joint enlargement were respectively seen in 44% and 14% of lame birds. Histopatological evaluation of lame birds revealed synovitis (16%), rickets (12%), osteochondrosis (10%), osteomyelitis (4%) and tibialdyschondroplasia (2%). Bone cultures was positive for *Staphylococcus spp*.(48%) and *Escherichia coli* (12%) in lame birds. Bone mineral contents showed no significant differences between lame birdsand normal birds. Serum calcium and bone densities of femur, tibia and tarsometatarsus were significantly higher in lame birds in comparison with normal birds. In contrast, PTH in lame birds was significantly lower in comparison with normal birds. In experimental study, none of the antibacterials resulted in completely successful treatment and prophylactic Vitamin C did not appreciably improve lameness and arthritis scores, although it decreased lipid peroxidation and improved weights of FF treated-arthritic birds.

Conclusion: The results of this study showed femoral head necrosis and valgus/varus as the most reasons of lameness in broiler flocks. Based on microbial culture,*Staphylococcus spp*. has greater prevalence than *E. coli* in lame birds in Shiraz region. The lameness in these flocks was not directly related with serum and bone mineral deficiencies and most probably were related to other reasons such as microbial infections of bones. Based on experimental study, successful treatment of arthritis could difficult to assess and these finding could justify high incidence of lameness in broiler flocks in spite of performing the recommended antibiotic therapies.

Key words:broiler chickens, lameness, bone density, serum parameters, *staphylococcus aurous*, antibiotic therapy, Vitamin C

Effectsof some medicinal compoundson theconsequences ofinfectious bronchitis and low pathogenic avian influenza diseases

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Objectives: Treatment with mucoactive, anti-inflammatory drugs, and antibiotics are some of the medicinal interventions which extensively used in the management of viral respiratory complexes of Iranian broiler farms. In this study, effects of some of these compounds were evaluated in the experimentally induced viral respiratory complexes.

Materials and methods: Five groups of chicks were infected withinfectious bronchitis virus IRFIBV32 isolate, 1×10^4 EID50, by eye drop andintranasal avian influenza virusH9N2 subtype, 1×10^9 EID50. Thirty-six hours after inoculation, group1 received50 mg/kg BW sodium salicylate, group2 received 20mg/kg doxycycline with 30mg/kg erythromycin, andgroup3 received 12.8mg/kg guaifenesin for 3 days via drinking water.Group4 were given the 3 drugs simultaneously at the same mentioneddoses. Control positive group were infected with both viruses but not treated, and control negative group inoculated with sterile saline and not treated. After challenge, clinical signs and lesions were scored and tracheal samples tested for IBVby RT-PCR.

Results and discussion: Results showed that these medicinal compounds decreased mortality rate of viral respiratory complexes which was noticeable in mix treated group. In addition, mix treated group showed significantly lower clinical signs compared with individually treated and positive control groups. Mixed treatment significantly decreased tracheal gross lesions and increased kidney gross lesions. Evaluation of microscopic lesions showed that the least lesions were belong to sodium salicylate treated group. None of the treatments had any noticeable effect on virus shedding time and production factors such as weight gain, feed consumption and feed conversation rate.

Conclusion: Treatment with the combination of these drugs decreased mortality rate and reduced clinical sign scores in comparison with non-treated group and other groups which treated with an individual compound.

Key words: Broilers, Doxycycline, Erythromycin, Guaifenesin, Infectious Bronchitis, Low Pathogenic Avian Influenza, Sodium salicylate

Molecular investigation of Psittacine beak and feather disease in south of Iran

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Psittacine beak and feather disease (PBFD) has been detected in both wild and captive parrot populations since the mid-1970s. The disease has been found to be widely infectious and often fatal, affecting both Old and New World psittacine species. It has been a major threat to wild parrot populations and has become a major cause for concern to conservationists and aviculturists as the disease has spread rapidly across the world due to BFDV's high environmental persistence and ability to shift between closely related host species. From early in April 2021 until last in september2022, 274birds from different parrot species with or without clinical manifestation of the feather or beak abnormalities were sampled,randomly. by molecular investigation of 717bp of *Rep* gen, the virus was detected in 174 cases (63.5%) which implies high prevalence and emergingconcernsfor the disease in captive psittacine population in south of Iran. Interestingly clinical signs varied from feather abnormalities to retarded growth to relatively normal appearance. Relative mean age affected was between 6month to 1year and as they were maintained in sporadic cages from fledgling suggesting long incubation periods and possibly vertical transmission of the disease. No mortality rate was detected as a result of conservative treatments or maybe because of new virus variants. Cockateil was the most affected species in this survey maybe because this species is the most common companion birds in Iran.Assessing the prevalence and impact of disease can be very useful especiallyfor improving of our understanding from virus origin, virulence, spread and evolution. Increased emphasis should be placed on the screening of captive and wild parrot populations within country

Keywords: Parrot, Beak and feather disease,cockateil, south of Iran

Comparison study of ND virus replication in SPF egg embryos and Vero cell line

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Background and Aim: Newcastle disease (ND) is one of the most important viral infectious agents with high contagiousness in birds with high morbidity and mortality in broiler and laying flocks. The disease is caused by type 1 avian paramyxovirus. In this study, the proliferation of ND virus on SPF egg embryos and Vero cell line was evaluated using HA and ECID50 viral titration assay methods. This study focuses on the adaptation of the V4 strain of Newcastle disease virus (NDV-V4) strains to the Vero cell line.

Materials and Methods: ND virus strain V4 was inoculated into the Vero cell line and SPF embryonated eggs (10-12 days old) through the CAM route. Standard methods of HA and ECID50 were used to determine the viral load. In the ECID50 method, the fatality within 24 hours post inoculations was not considered. The surviving embryos were examined for evidence of the infection.

Results: The results of HA and ECID50 of the virus harvested from the SPF chicken eggs and Vero cell culture were 9, 7.8, 7, and 6.1 respectively. The highest amount of virus multiplication was obtained in the fifth passage.

Conclusion: The results of this study showed that the V4 strain of the ND virus can be easily propagated in the Vero cell line and the data confirmed the ability of the virus to adapt in Vero cells. Also, these results revealed that this cell line can be used like embryonated eggs for virus proliferation for research purposes or vaccine production.

Keywords: Newcastle Disease Virus, Vero cell line, SPF, HA, ECID50

Comparative study of avian adenovirus EDS-76 inactivation by formaldehyde and binary Ethyleneimine

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Background and Aim: Egg Drop Syndrome Virus (EDSV) is one of the most important diseases that affect Laying flocks; the epizootic nature of the disease has caused severe economic losses in the poultry industry worldwide. In this experiment, EDSV was inactivated by two different chemicals Binary Ethylenimine (BEI) and formaldehyde.

Materials and Methods: EDSV harvested in duck embryos with (HA=12), inactivated by BEI and formaldehyde at concentrations of 0.001 to 0.005 M, 0.1 and 0.2 % respectively. The inactivation process was done in various incubation temperatures and periods, and the inactivation proceeding was confirmed based on the standard procedure in three consecutive stages in SPF embryos (10-12 days old). The standard method of controlling the virus inactivation was carried out by inoculation of the virus into the chorioallantoic membrane of SPF eggs in three consecutive stages.

Results: our results confirm that the best temperature, concentration, and time for the inactivation of EDSV by BAI was 35°C, 0.005 M, and 20 hours, whereas formaldehyde in concentrations of 0.2% at 35°C was able completely to inactivate the virus in 25 hours, respectively.

Conclusion: According to our results, the ability of BEI compared to the formalin to EDSV inactivation had better performance, and BEI with a lower concentration, at a lower temperature, and in a shorter time can inactivate EDSV. This function could be associated with the preservation of the structural and antigenic integrity of EDSV during the BEI inactivation. This result and other advantages of BEI could be candidates for formaldehyde alternative agents in vaccine production and other inactivation research targets.

Keywords: Inactivation, Formaldehyde, Binary Ethylenimine, avian adenovirus

Candidiasis in budgerigar chick and prevention of disease in ornamental birds

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Objectives: Candidiasis is a zoonotic and fungal disease caused by the opportunistic yeast Candida albicans. The disease occurs in humans, animals, and birds. Affected cases may show different clinical signs and symptoms. This disease has been reported in different species of birds, including wild, domestic, and ornamental birds. The disease usually occurs following the weakening of the immune system and the disruption of the microflora. In some cases, candidiasis occurs with other diseases. Due to the increasing public interest in keeping ornamental birds and the possibility of candidiasis transmission from birds to humans, it is necessary to diagnose, prevent and control the disease in ornamental birds.The aim of this study was to describe candidiasis in budgerigar chicks and prevention strategies in ornamental birds.

Materials & Methods:2.5-month-old budgerigar chicks were referred to the Faculty of Veterinary Medicine of Shahid Bahonar University, Kerman, Iran. These birds were illegally imported from eastern borders without permission from veterinary centers. In clinical evaluations, weakness, lethargy, and progressive weight loss were seen. In the dissected birds, the thickening of the esophagus wall and white curdy pseudomembrane in that organ were observed. Esophagus, feces, and intestine samples were taken to the laboratory for further investigation.

Results and Conclusion: Candidiasis was confirmed by observing Candida albicans yeast in the samples sent to the laboratory. Considering the illegal importation of birds into the country, appropriate diagnostic and quarantine measures should be taken at the borders to prevent and control disease in ornamental birds.

Keywords: ornamental birds, control, candidiasis, pathology, clinical evaluation

Colisepticemia investigation in commercial partridge chicks

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Objectives: Colibacillosis is a major source of morbidity and mortality in the chicken industry, as well as significant economic losses. Avian infectious Colibacillosis is a complex syndrome marked by several organlesions such as air sacculitis, pericarditis, peritonitis, salpingitis, synovitis, osteomyelitis, or yolk sac infection. The aim of the present study was to determine the cause of mortality in many commercial partridge chicks after hatching.

Materials & Methods: In this study, day old commercial partridge chickens were referred to the clinic of the Faculty of Veterinary Medicine of Shahid Bahonar University. Significant clinical signs in these birds were sudden death, which occurred in 10-20 % of chicks after hatching. All infected birds died within 24-72 hours. Chicks that survived showed general clinical signs including weakness, depression, anorexia, drooping wings. In some birds,diarrhea was noted. No gross lesions were observed in chicks that died very suddenly. In some dissected chickens, the pericardial sac was filled with fibrin secretions and the liver becomes congested. Some kidneys were swollen, and some were pale.Fecal samples were collected from the intestines of euthanized chickens. Heart and liver blood were aseptically collected for further investigation.

Results and Conclusion: The results of fecal examination showed the predominant presence of gram-negative rod bacteria. Bacteriological cultures of blood, heart and liver confirmed generalized septicemia. Bacteria are abundantly isolated from those affected organs. Finally, coli septicemia was confirmed in those partridge chicks. This finding showed that coli septicemia is a very important disease in chickens of game birds and should be controlled with appropriate methods.

Keywords: Bird, Coli Septicemia, Partridge, fecal examination, pathology

Investigating the shedding pattern of avian influenza (H9N2 subtype) in the feces of broiler chickens

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Objectives: In recent years, low pathogenic avian influenza (LPAI H9N2) subtype has become an endemic disease in Iran. This disease has caused significant economic losses in Iran's poultry industry due to the decrease in production and increase in mortality. The shedding of the avian influenza virus in different organs of poultry plays an important role in the epidemiology of diseases and can be effective in preventing its transmission. The aim of the present study was to quantify the shedding of H9N2 avian influenza virus in the feces of broiler chickens at different times post inoculation.

Materials & Methods:28-day-old commercial broilers were randomly divided into two experimental and control groups. The birds in the experimental group were inoculated with 10^6 EID50 A/chicken/Iran/SH-110/99 (H9N2) virus through the nose. Fecal samples were collected on different days after inoculation. Real Time PCR method was used to identify and quantify the virus in the samples.

Results and Conclusion: The results showed that the H9N2 AI virus can be excreted from the feces of birds from the 7th to the 11th day after inoculation. Viral titers in feces were more than 70000 and 100000 (copies/1 µL of total RNA) on days 7 and 11 PI, respectively. Our study showed that LPAI H9N2 fecal shedding was prolonged approximately 11 days PI in broilers. According to the results obtained from the present research, it can be concluded that following the infection of broiler chickens with H9N2 influenza virus; these birds can shed the virus for 11 days and transmit the disease to nearby birds. Therefore, appropriate quarantine measures should be taken during this period to prevent isease in chicken farms.

Kdeywords: Chicken, influenza, H9N2, Feces, shedding,real Time PCR

A survey of Eimeria species and Cryptosporidiosis infectious in feces of local chickens of Behbahan area.

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To identify different *Eimeria* species in native birds of Behbahan, 100 facal samples were examined using modified McMaster method. The collected oocysts were counted in each sample (OPG), Sporulated in potassium dichromate solution (2.5%) and identified on the basis of morphological characteres. The results showed 15 samples out of 100 (15%) were infected. Five species including *E. acervulina* (80%), *E. maxima* (60%), *E. brunetti* (53.3%), *E. tenella* (33.3%) and *E. Mitis* (26.6%) were identified with mean OPG 17.76 × 103. Only one case out of 15 was infected with one species of *Eimeria*, and remainingwere infected, with 2 – 4 specieses of same genus of parasites.

In order to determine the rate of *Cryptosporidium* infection for the native birds of Behbahan, a sample of 100 feces spreads was provided. These samples were first stabilized using 70% methanol and stained under the Modified Zeheil Neelsen method. They were examined using an optical microscope. From the obtained spreads, 8 samples (i.e., 8%) have been recognized as positive. The oocysts in the birds' excretion showed a close resemblance to those in the *Cryptosporidium meleagridis*. *Cryptosporidium meleagridis* has recently been widely recognized as a zoonosis, threatening the health of birds and mammals, including humans. Since *Cryptosporidium meleagridis* is highly contagious, paying attention to its role in the outbreak of Cryptosporidiosis is important. Besides, regarding the Iranian villagers' inclination for raising domestic birds and existence of numerous mostly-industrialized poultry farms throughout the country, it more extensive studies on the birds' parasite contamination are essential.

Keywords: *Eimeria*, Native birds, Modified Mc-Master method, *Cryptosporidium meleagridis*, Modified Zeheil Neelsen.

The report of *Cryptosporidium meleagridis* infection in native birds of Behbahancounty.

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Objectives: Cryptosporidosis is one of the common diseases among human and other animals.The causative agent is protozoa from Cryptosporidium Spp.From general public and veterenary field view point, this protozoahas great importance due to it is resistence against enviromental and physicochemical condition.

Materials &Methods: In the present study 100 samples were collected from feces native birds of Behbahan. Smears,after being fixed in methanol (70%), were stained by modified Ziehl- Neelsen (MZN) technique.Microscopic examination of the stained smearsrevealed that 8 (8%)sampleswere positive for *Cryptosporidium* parasite.

Results &Conclusion: Similarly, in the present study, a close resemblance has been observed between the oocysts found in the indigenous birds' excretion and the oocysts in the *Cryptosporidium meleagridis* (4.5-6.0 by 4.2-5.3µm). The reason for this low level of infection among the birds indigenous to Behbahan is perhaps due to the narrow population of the birds per unit area in the rural and conventional aviculture places. It can also be accounted for by the increase in the industrialization of the fowl husbandry in Behbahan, which is in turn accompanied by further observation of hygienic principles and hence a reduction in the risk of disease incidence. This shows that occurrence of Crptosporodiosis is noticeable

Keywords:*Cryptosporidium meleagridis*,native birds, Modified ZeheilNeelsentechnique.

The capability of dietry l-carnitine -mediated antioxisant improved semen quantity and quality in rooster

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Objectives: Good semen quality plays a very important role in promoting poultry breeding programs. Due to its antioxidant properties and role in fat metabolism, L-carnitine seems to be effective in improving semen quality. Therefore, this study was performed to evaluate the effect of dietary L-carnitine supplementation on motility parameters and qualitative traits of semen cobb breed rooster.

Materials & Methods:A total of 20 roosters, 24 weeks-old were randomly assigned to four experimental groups. Experimental groups included diets containing 0, 125, 250 and 500 mg L-carnitine per kg diet. After 42 days of feeding with experimental diets, semen was collected twice at an interval of 14 days from each rooster. The collected semen was immediately evaluated for motility parameters and sperm quality traits. Repeated measures data were analyzed with a linear mixed mode using SAS statistical program.

Results & Conclusion: The results showed that the treatments containing 250 and 500 mg of L-carnitine compared to the control and other groups significantly improved the motility parameters and sperm quality traits ($P< 0.05$). However, in most parameters, there was no significant difference between 250 and 500 mg of L-carnitine per kg of diet. Semen collection time had no effect on sperm parameters ($P< 0.05$). According to the research results, the addition of L-carnitine at a rate of 250 mg / kg diet is recommended to improve motility parameters and sperm quality traits.

Keywords: dietary, sperm motility, L-carnitine, Cob

Molecular Identification of Aviadenovirus in CommercialPoultry Farms in Tehran Province

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Objectives: Avian adenoviruses are widely distributed in commercial flocks of the world and show a wide variety of virulence and clinical signs.The disease is usually characterized by a sudden increase in mortalityranges between 5% and 10%, but occasionally can reach to 30%.In the past year, we have observed several outbreaksof IBH and HHS due to the widespread of the virus in Iran.The disease can be diagnosed through the observation of gross lesions accompanying with histological lesions in affected birds. In addition, PCR is recognized as a suitable method for detection and identifying the strains throughout the world.The aim of this study was molecular identification of fowl adenovirus in commercial poultry farms in which the clinical signs of this virus were seen.

Materials & Methods: The study was conducted from June 2022 until October 2022. 25 samples were taken from 7 industrialpoultry farms suspected to IBH indicating the clinical signs of depression, respiratory and digestive signs and mortality and enlarged and pale-yellow livers with multiple petechial hemorrhages at necropsy.The liver samples were transferred to Shargh Veterinary Hospital for molecular detection. DNA was extracted from samples.The 590 bp region of the Hexon gene was amplified using specific primers with the sequence Hex L1-F 5´-ATGGGAGCSACCTAYTTCGACAT-3´ and Hex L1-R 5´-AAATTGTCCCKRAANCCGATCTA-3´. A total of 6 positive PCR products from 6 farms were sequenced and analyzed.

Results & Conclusion: The PCR showed positive results in 20 samples belonging to 6 farms.Sequence analysis of PCR productsshowed that all samples were type FadV-4(from Species FadV-C serotype) indicating the pathogenicstrains of Aviadenoviruscirculating in commercial poultry farms. Within each group, the differences were observed in the sequence of positive samples obtained from different farms.

Keywords: Aviadenovirus, Poultry Farms, PCR, sequencing, FadV-4

A Survey of gastrointestinal coccidian parasites inreferral pet birds ofveterinary clinics in Tehran

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Objectives: Birds from various families and genera comprise a notable proportion of veterinary clients in Tehran veterinary clinics. Regarding the scarcity of information on avian coccidia in common pet birds, this study was designed to surveythe existence and identify the diversity of gastrointestinal coccidian protozoa in the referred ornamental birds.

Materials & Methods:A total of 145 fecal samples were takenfrom pet birdsreferred to veterinary clinics in Tehran. Droppings were collected in 2.5% potassium dichromate and examined for the presence of oocysts by wet smear followed by flotation with saturated salt solution. If oocysts were detected, the fecal samples were incubated for sporulation and further morphological studies. Special Modified Ziehl-Neelsen stain was used for the detection of *Cryptosporidium* oocysts.

Results & Conclusion: Collected feces from pet birds belonged to four orders Psittaciformes, Passeriformes, Columbiformes, and Galliformes. In terms of bird species, among 145 investigated samples, the most common host species was the cockatiel *(Nymphicus hollandicus)* (22.8%), followed by African grey parrot*(Psittacus erithacus)* (16.5%), canary *(Serinuscanaria*) (14.5%), budgerigar *(Melopsittacus undulatus)* (10.3%) and common mynah*(Acridotheres tristis)* (9.0%), respectively. Parasitological investigations revealed *Cryptosporidium*sp. infection in a quail*(Coturnix coturnix),Isospora* oocysts in a common mynah and a canary, and *Eimeria* oocysts in a canary (2.7%).The obtained results showed a low contamination rate (2.7%) in pet birds (among the Galliformes and Passeriformes families) and this rate possibly attributes to their limited and controlled living environment. Despite the low infection rate in the current study, the detection of potentially zoonotic pathogens like *Cryptosporidium* sp., the public health importance and in case of non-zoonotic species, the capability of the pathogen to cause clinical infectionin case of stress and immunosuppression in captivity, have to be taken into consideration.To further proceed the findings of the present study, molecular methods to characterize the parasite isolates and experimental challenges to determine the host specificity/spectrum of detected isolates are recommended.

Keywords: Pet birds, *Cryptosporidium*, *Isospora*, *Eimeria*, Tehran, Psittaciformes, Columbiformes.

Molecular and histopathological detection of Fowl aviadenovirus serotype 4from an outbreak of Hepatitis Hydropericardium Syndrome in commercial broiler chickens in Shiraz

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Objectives: In this study, two broiler farms with high mortality and obvious liver and pericardial sac lesions were investigated for the presence of avian adenoviruses.

Materials and methods: A 14-day-old commercial broiler flock with the history of rising mortality was referred to Avian Diseases Research Center of Shiraz University. Mortality was around 20 % for two first weeks which rise to 70 % within two consecutive weeks before the complete depopulation of farm.Simultaneously, we encountered with another broiler flock originated from a same parent flock with similar grosslesions. The dead birds of these two farmsinvestigated with postmortem examination, histopathology, molecular testing, and phylogenetic analysis for possible disease agent. The extracted DNAs from liver samples were subjected to the conventional PCR amplifying the loop-1 region of hexon gene of adenoviruses. Positive PCR products were sequenced and aligned using Clustal W method inMEGA software and phylogenetic tree was constructed with comparison of these sequences with deposited related sequences in GenBank.

Results and discussion: Enlarged hydropericardium with the accumulation of massive straw-colored fluid in the pericardial sac were seen in almost all the necropsied cases. In addition, enlarged and mottled livers with petechial hemorrhages were present in most of the birds. Large and pale kidneys were seen in some dead birds. No gross lesions were seen in bursa, thymus, respiratory system and other parts of gastrointestinal tract. Histopathologic analysis showed extensive necrotizing hepatitis with adenoviral basophilic inclusion bodies in the livers and myocardia of the hearts. Adenovirus were detected via PCR in both farms. Sequencing of positive PCR products assigned detected viruses as FAdV-4.After the confirmation of avian adenovirus in histopathology and PCR, the farms were depopulated and recommended to keep the farms empty for at least two months.

Conclusion: There were no additional reports of adenovirus related diseases in nearby farms and also next rearing period of these affected farms. It was concluded that good biosecurity, complete depopulation of infected farms and prolonged vacant times between two rearing period could decrease the risk of adenovirus circulation in chicken farms.

Key words: Broiler chickens, Hepatitis Hydropericardium Syndrome, Avian adenovirus

Histomoniasis outbreakin peafowls infected with HeterakisGallinarum

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Histomonasmeleagridis is a flagellate protozoan organism that can cause severe necrotizing typhlitis and hepatitis in gallinaceous birds. Peafowl (Pavo spp.) have been shown to be susceptible to histomoniasis in experimental settings, but there are few reports of natural histomoniasis in this species.

A study on some cases with black diarrhea and severdehydration ,with gross and histologic findings characteristic of histomoniasis. Lesions included bilateral, transmural fibrinonecrotictyphlitis and multifocal necrotizing hepatitis with associated trophozoites morphologically consistent with H. meleagridis. The evidence of Heterakisgallinarum infestation in the studied cases were seen in parasitology.

Current report goes to the examination of a number of adult and young male and female peacocks with symptoms of weakness, lethargy, black diarrhea and blackening of the crown, the stool samples were examined, then two carcasses of dead peacocks were dissected and numerous focal lesions were observed. Necrotic and fire-fighting lesions in the liver, severe inflammatory and anemic tissues were observed in the intestines, especially the cecum. In the autopsy, a large amount of black content was noted in the cecum and colon. Parasitological and bacterial preparations were made, in parasitological tests, the presence of 7 to 15 mm male and female roundworms was determined with a loupe microscope, the presence of a spicule of about 2 mm and specific appendages at the end of the body of the male worm and the female genital opening in the middle part of the female body. With the large volume of the uterus and the eggs in it, with the special structure of the esophagus and the wide layer around the body, it was seen under the microscope.

The presence of necrotic lesions with a yellow halo around the size of 7 to 10 mm in the liver was also a sign of histomoniasis invasion of the digestive system and finally in the liver.

The treatment for the herds carried out using levamisole and furazolidone with garlic for a week, also a complete biosecurity for the food, litter and cage also well done.

The Effect of Different Levels of Dietary Metabolizable Energy and Copper-Methionine Supplement on Performance of Broilers

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Objectives: The purpose of this study was to determine the effect of different levels of dietary metabolizable energy and copper-methionine supplement on performance of broilers. The main part of poultry feed is used for energy production to provide the maintenance, growth and production requirements. The increasing of dietary metabolizable energy decreases feed intake and improves body weight gain, feed conversion ratio and finally production index of broilers. The increasing of dietary metabolizable energy is feasible via oils and fats consumption. The dietary oils and fats may be oxidized and need to antioxidants for prevention of oxidation. Peroxidation of oils and fats may disturb antioxidant defense mechanisms of hens, cause oxidative damage and reduce the performance of broilers. Copper is a part of superoxide dismutase enzyme. Superoxide dismutase neutralizes free radicals. Therefore copper has antioxidant property and can improve the performance of broilers.

Materials & Methods: A total of 576 one-day old Ross 308 male broiler chicks were assigned in a 3×4 factorial arrangement with completely randomized design to 12 treatments and 4 replicates of 12 chicks in each. The factors of interest included different levels of dietary metabolizable energy (at Ross catalogue recommendation (3025 kcal/kg), 100 kcal lower than that of Ross catalogue recommendation (2925 kcal/kg) and 100 kcal higher than that of Ross catalogue recommendation (3125 kcal/kg)) and different levels of dietary copper-methionine supplement (0, 150, 300 and 450 mg/kg). The diets were formulated according to Ross 308 catalogue recommendations. The lighting program included 23 hours lightness and 1 hour darkness. Feed and water were supplied *ad libitum* during the entire experimental period. The performance traits including feed intake, body weight gain, feed conversion ratio and production index were determined at the end of entire experimental period (49 day of age). The data were analyzed using the GLM procedure of SAS. Comparison of means was conducted by Duncan's multiple range test.

Results & Conclusion: The results of this experiment showed that the effect of different levels of metabolizable energy and copper-methionine supplement and experimental treatments was not significant on none of the performance traits of broilers ($P>0.05$). According to the results of this study, it seems that the increasing of metabolizable energy level and addition of copper-methionine supplement to the diet can not improve the performance of broiler chickens.

Keywords: Metabolizable energy, copper, methionine, performance, broilers

An antibiotic resistant Salmonella typhimurrium isolated from Parrots

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Background and aim:

Salmonellosis in birds classified in 2 types included motile and non motile Sps.; In the chickens just S.Pollurom and S.Gallinarum are non motile and had specific host, but S.Arizona and other motile salmonellas are very important due to public health and birds mortality.

Material and methods:

In current report it is notify that some parrots of Isfahan birds garden shown weakness, anorrehexia, dehydration and mucosal diarrhea ,in clinical exams some nervous sign also were recognized. Therefore the HI test for NDV done ,but no clinical ND titer were observed, the conservative treatments were ORS and multivitamine therapy ,the samples of liver and spleen from 2 died parrots with discoloration of liver and atrophy of spleen were prepared for bacterial culture and antibiogram tests.

Conclusion:

The isolated bacteria were a motaile salmonella and based on biochemical tests it was S.typhimurrium, antibiogram test the bacteria were resistant to Kanamycine, Tetracycline, Amoxiciline, Chlramphenicole, Flamequine, Gentamycine, Enrofloxacin, Neomycine and Strepyomycine,but sensitive to Florphenicole, Danophloxacine, Sulfaethoxazole (++++) and Lincomycine(+) and Fosbac(+++++).

Key words: Isolation, S.typhimurrium ,antibiogram ,Parrot

Improvement of Airan Roosters's Erythrocyte Osmotic Fragility by Dietary Supplementation of AlkalineHydrolyzed Feather Meal

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Objectives:The study aims to investigate the impact of alkaline hydrolyzed feather meal (**AHFM**) on the erythrocyte osmotic fragility (**EOF**) of Arian adult roosters. Several dietary and other environmental factors affect erythrocyte fragility. Alkaline hydrolyzed feather meal is rich in sulfur amino acids, especially cysteine. Cysteine is a glutathione precursor and has an antioxidant effect that prevents the oxidation of fat and protein and protects the cell against abnormal morphology and fragility.This amino acid helps the body regenerate zinc which can play a vital role in maintaining membrane structure and function and prevents red blood cell membranes from breaking.

Materials & Methods: In total, 20 Arian adult roosters at 45 weeks old with uniform body weight were randomly assigned to four treatments and five replications. The experimental groups include zero (control group), 2.5 g/kg, 5 g/kg, and 7.5 g/kg **AHFM**. The duration of the experiment was 12 weeks. Blood samples were collected from each bird in the eleventh and twelfth week of the experiment and then the fragility of red blood cells was tested.

Results & Conclusion: Results showed that the highest **EOF** of red blood cells belonged to the control group and the best and lowest osmotic fragility of red blood cells belonging to the treatment with 5g/kg **AHFM**. Finally, according to our results, **AHFM**at 5 g/kg level can reduce the osmotic fragility of red blood cells. The high sulfur amino acids contents and anti-oxidant properties of **AHFM** may take part in the observed results.

Keywords: Alkaline Hydrolyzed Feather Meal,Cysteine, Broiler breeder, Erythrocyte Osmotic Fragility.

Monitoring for AIV (H5N8 & H9N2) in Isfahan wild birds

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Isfahan bird garden is a park for various wild birds included about more than 135 specious from passerine to song and water fowls and with a population of 3000 inside ,this park is located on the beach of Zayabdeh rood river which is the largest river in centre of Iran. Last year more than 20,000,000 , visited this park, meanwhile regarded to outbreaks of H5N1 in the neghiborhood countries of Iran included Turkey , Iraq ,Turkmenistan ,Ghazaghestan and immigration of birds from the north pole to southern area and Zayandehroode river ,themonthly monitoring of 5-6% of sensitive birds were done, therefore using a sterile siring , about 2 ml of blood of wing vein collected and transfer to lab for AIV titration, and sometimes stools for Rapid test .

The technical methods were HI ,ELISA and Rapid tests(Immunochromatography assay)and RT-PCR for confiration.

The H9N2 titration were different in birds, but the highest titer (8-6) were related to chickens and peacock which were at the most stress risk of visitors, the lowest titer (0-3) were related to water fowls such as Ducks, Pelicans , Flamingos ,Gooses .The other birds has the titer from 4-5.

In H5N8 monitoring fortunately there were not any positive sera and in some cases which had the suspected titer the ELISA, Rapid test and RT-PCR confirmed the negative results.

This monitoring monthly is carried out and sanitization of garden and gates and with widely antiseptic material carried out daily

Key words: Monitoring , H5N8, H5 N9, Birds, Isfahan

The Effect of Different Levels of Dietary Metabolizable Energy and Copper-Methionine Supplement on Immunity System Status of Broilers

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Objectives: The aim of the present study was to evaluate the effect of different levels of dietary metabolizable energy and copper-methionine supplement on immunity system status of broilers. The major portion of poultry feed is used for energy production to provide the maintenance and growth requirements. The increasing of dietary metabolizable energy decreases feed consumption and improves body weight gain and feed conversion ratio of broilers. The raising of dietary metabolizable energy is mainly done via addition of oils and fats. The dietary oil and fat sources may be oxidized and need to the presence of antioxidants for prevention of oxidation. Peroxidation of oils and fats may disturb antioxidant defense mechanisms of hens, cause oxidative damage and attenuates the immunity system. Copper is a part of superoxide dismutase enzyme. Superoxide dismutase neutralizes free radicals. Therefore copper has antioxidant property and can reinforce the immunity system.

Materials & Methods: A total of 576 one-day old Ross 308 male broiler chicks were allotted in a 3×4 factorial arrangement with completely randomized design to 12 treatments and 4 replicates of 12 chicks in each. The factors of interest included different levels of dietary metabolizable energy (2925, 3025 and 3125 kcal/kg) and different levels of dietary copper-methionine supplement (0, 150, 300 and 450 mg/kg). The diets were formulated according to Ross 308 catalogue recommendations. In order to evaluate the humoral system status, blood samples were taken one week after Newcastle vaccine administration. At 49 day of age, one bird with body weight nearest to average body weight of the experimental unit was selected and slaughtered after weighing and lymphoid organ weights including spleen and bursa of Fabricius were measured. The data were analyzed using the GLM procedure of SAS. Comparison of means was conducted by Duncan's multiple range test.

Results & Conclusion: The results of this experiment showed that the effect of different levels of dietary metabolizable energy and copper-methionine supplement was not significant on relative weights (percent) of spleen and bursa of Fabricius ($P>0.05$), however their effects were highly significant ($P<0.01$) on antibody titer against Newcastle vaccine so that antibody titer against Newcastle vaccine increased as dietary metabolizable energy and copper-methionine supplement level increased. Based on the results of the present study, it seems that the increasing of metabolizable energy level and addition of copper-methionine supplement to the diet can improve the immunity system status of broilers.

Keywords: Metabolizable energy, copper, methionine, immunity system, broilers

High Prevalence of Multi-DrugResistance and Biofilm-Formation Ability AmongAvian Escherichia coli Isolated from Broilersin Iran

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Objectives: The present study was conducted to determine the antimicrobial resistance pattern and biofilm- formation ability in 100 Avian-Pathogenic *Escherichia coli* (APEC) isolated from colibacillosis-suspected broilers, and 100 Avian Faecal*E. coli* (AFEC) isolates from healthy broilers in Hamedan, Iran.

Materials & Methods: The antibacterial susceptibility testing of avian *E. coli* strains was performed using the Kirby-Bauer disk diffusion method according to the Clinical Laboratory Standard Institute guidelines (CLSI, 2019).All isolates were screened by PCR for antimicrobial resistance genes, class 1 and 2 integrons andbiofilm-associated genes.Besides, we assessed the possible relationship between biofilm-formation ability, antibiotic resistance patterns, genetic background and, the pathogenicity of APEC strains.

Results & Conclusion:81% of APEC and 73% of AFEC isolates showed multi-drug resistance(MDR) phenotype, in addition, 45% of the APEC and 21% of the AFEC strains showed biofilm-formation ability. This is the first report of the biofilm formation ability in *E. coli*isolated from broilers in Iran. Themost prevalent antibiotic resistance gene in APEC strains was *tetA* (68%), followed by*sul1*(63%), *dfrA1-like*(51%) and, bla_{TEM}(30%), whereas in AFEC strains, the frequencies of the antibiotic resistance genes were *tetA* (63%), *sul1*(58%), *dfrA1-like* (49%) and, bla_{TEM}(22%). Out of 81 MDR APEC isolates, 53(65.4%), and38 (46.91%) isolateswere positive for *intI1* and *intI2* genes, respectively. In the AFEC strains *intI1* and *intI2* genes were presented in 57and 33 isolates, respectively. All APEC isolates belonging to phylogenetic groupsB1, B2 and C wereMDR. The results of the present study indicate that isolates with biofilm-forming ability show more MDR properties, and probably have more pathogenicity to broilers.

Keywords:Multi-drug resistance; MDR, biofilm, Avian-Pathogenic *Escherichia coli*; APEC, Avian Faecal*Escherichia coli*; AFEC,colibacillosis, broiler.

Evaluationof ELISA titer of Infectious bursaldisease (IBD) related to vaccination programresultsin two Layer flocks

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Objective: Gumboro disease (IBD) is one of important immunosuppressive poultry disease that makes massive economical loss in poultry industry. Suitable Vaccination program is determined by farm veterinarians with different methods to prevent disease. The interaction of maternal antibody (Ab) and vaccine-derived antibody is very important in obtaining good results. In order to determine an optimal vaccination program to prevent infectious bursal disease (IBD) in layer flocks of Seamorghcompany, khorasan branch, the titer of flocks were assessed before and after vaccination regard to maternal titer of chicks to establish a basis for a vaccine program in successive flocks.

Materials & Methods: 20 chicks of two flocks were used for serum sampling in each steps. IBD ELISA test were done on each sample. The results were compared and analyzed with excel program to next inference.

Results & Conclusions: Regard to importance and danger of IBD disease it is important to have a protective titer in suitable time of rearing period. The comparison of results and charts regard to regional involvement of the disease and different performed vaccination program in commercial flocks showed that A protective titer in suitable time be created by setting and modifying the time and number of vaccines in each flocks. Indeed it is important to challenge the bird immune system regard to maternal Ab andprescription of the first dose of live vaccine as soon as possible. In fact it should be according to maternal Ab and simultaneously with the maternal titer decreasing. In these vaccination programs, it is possible to use different combination of live and killed vaccines to acquire immunity against disease as soon as possible at the right time, to protect flocks. In these cases we can use different methods like "Deventer" to determine the time of first dose.

Keywords:Infectious bursal disease (IBD), Gumboro disease, vaccination program, Deventer formula

Ectoparasite of ornamental birds in Urmia city, Iran

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Objectives: This studyaimed to determine the prevalence of ornamental birdinfestation withectoparasites in Urmia city because this avian groupis in a close relationship with humans, it is of greatimportance to pay attention to their health and hygiene.

Materials & Methods:A total of 450 birds included pigeon (120), finch (50), love bird (150), canary (100) and parrot (30) were examined from bird shops in Urmia city in order to investigate contamination of ornamental birds.

Results & Conclusion: Results indicated that20 (20%) of canary,4 (8%) of finch, 3(2%) of love bird and 2 of parrot (6.66%) were infected with *Cnemidocoptespilae*. *Columbicolacolumbae*and *Argasreflexus*infestation were seen in 11 (9.16%) and 2 (1.66%) pigeonsrespectively.This study increased our knowledge on the ectoparasite infestation of pet birds.Considering theprevalence of parasitism in ornamental birds, it is necessary to disinfect the cages, compliance with hygieneand isolate the infected birds.

Keywords: Ectoparasite, birds, Urmia, Iran

Comparison of the effect of different sources of selenium on the performance and amount of selenium storage in edible tissues

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Objectives: This study was designed for evaluation of different sources of selenium supplement on growth performance and deposition of selenium in edible tissues in chickens.

Materials & Methods: In this study, 180 one-day-old broiler chicks (ROSS 308) were randomly divided into 3 groups with 3 replications of 20 chicks, and were kept under the same management and breeding conditions from the age of one day to 42 days. The diet of all groups were adjusted according to NRC recommendations. The first group received sodium selenite, the second group received nanoselenium, and the third group received organic selenium (yeast selenized) at the rate of 0.3 mg per kilogram. Growth indices (Growth gain, Feed intake and Feed conversion ration) were calculated and recorded weekly during the breeding period. At the end of the breeding period, breast, thigh and liver muscle tissue samples were obtained from all chickens and the amount of selenium was determined by atomic absorption spectrophotometry. Data were compared with SPSS statistical program and ANOVA statistical method in different groups ($P<0.05$).

Results & Conclusion: The results showed that the weight gains in the chickens receiving nanoselenium and organic selenium is significantly higher than the chickens receiving inorganic selenium. Also, the amount of selenium reserves in the breast, thigh and liver in the chickens receiving organic selenium and nanoselenium is more than the chickens receiving sodium selenite. Therefore, it seems that nanoselenium and organic selenium sources have more bioavailability and therefore its absorption and expansion in edible tissues is more. In addition, the greater bioavailability can increase growth and performance indicators.

Keywords: Chickens, Selenium, Selenium residue.

Comparative evaluation of Immunogenicity of inactivated vaccines produced from Cell culture and Duck Fibroblast culture antigens against EDS-76 avian adenovirus

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Background and Aim: The egg drop syndrome virus (EDSV) is a member of the genus Atadenovirus within the family Adenoviridae. This virus causes a sudden decrease in egg production, production of eggs without shells, thin shells, color change, or deformity, and the only way to prevent the disease is to vaccinate the laying hens. This study aimed to compare the immunogenicity of adapted EDSV in duck embryo fibroblast (DEF) cell culture and duck egg culture against EDSV disease using inactivated oil vaccines.

Materials and Methods: Two inactivated oil vaccines according to DEF cells culture and eggs embryonated culture is produced. The immunogenicity of vaccines was examined in SPF 21-day-old chicken by HI assay, and the measurement of antibody titration continued until 70 days.

Results: the result of the study revealed that the antibody titers of both vaccine groups were similar and there was no significant difference between the two vaccine groups ($p>0.05$). It seems that the vaccines derived from cell culture and eggs embryonated culture can stimulate the immune system of chickens and the HI average antibody titer in duck egg culture and DEF vaccine groups were 8.31, 8.1, and 7.7 and 7.9 respectively, and the highest antibody titer was related to 28thday, and the continuation of antibody production until the age of 70 days was very suitable (HI=7.9, and ECID50= 7.6).

Conclusion: According to the results of the present study, the ability of DEF cell culture to produce EDSV and its ability to create a high immunogenic response in SPF chickens has produced similar results compared to virus culture in duck eggs, Hence, considering the above results and other advantages of DEF cell culture, such as economic, high speed and easy process, no need to a large amount of fertilized eggs, Less manpower needed, omit of different stages of virus injection and harvesting, incubation and candling, make it as a good alternative candid to embryo egg culture. Therefore, it is suggested to use DEF cell culture for EDSV propagation instead of egg culture.**Keywords: Immunogenicity, inactivated vaccines, Duck Fibroblast, SPF, avian adenovirus**

Effect of mixed extract of herbal medicine on some biochemical parameters in pigeon

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Objectives: This study was done to investigate the effect of adding *Thymberaspicata* and *Ferulago angulata*to the pigeondiet ata level of 2% on thier performance and some blood parameters.

Materials & Methods:A total of 56 unsexed pigeon of 28 days old were allocatedinto four dietary groups including Control (basal diet), mixed *Thymberaspicata* and *Ferulago angulate, Thymberaspicata* and *Ferulago angulate*in a complete randomized design.

Results & Conclusion: Addition of mixed *Thymberaspicata*and *Ferulago angulate*had significanteffects on live body weight, weight gain, feed intake, feed conversion ratio (FCR) and organs weight (liver andgizzard) and dressing percentage($P<0.05$). Heart weight showed no significant change in the experimental groups ($P>0.05$). Adding mixed *Thymberaspicata* and *Ferulago angulate*to the pigeon diets decreased the AST, ALT and glucose levels($P<0.05$). No difference wasobserved in cholesterol, total protein and creatinine ($P>0.05$).

Keywords: Herbal plants, pigeon, Feed conversion, Creatinine

Effects of mixed extract of herbal medicine on growth performance, slaughter performance and blood biochemical parameters of pigeons

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Objectives: Antibiotics could promote the production of livestock; however the long- term use in livestocks may pose a risk to human health. Herbal medicine can improve the performance and immune function of livestock with no drug resistance and relatively less toxicity. This study was done to evaluate the effects of herbal medicine and antibiotics on growth performance, slaughter performance and blood biochemical parameters of pigeons.

Materials & Methods: Seventy- two pairs (male & female) of breeding pigeons were selected and randomly divided into 3 groups including control, antibiotic (41.4 mg/kg doxycycline and 10 mg/kg florfenicol) and herbal medicine group (2% hydroalchoholic extract + *Thymberaspicata* and *Ferulagoangulata*). The weight of squabs and feed intake were recorded weekly during the experiment. On day 28, three pigeons per replicate were randomly slaughtered to determine blood biochemical parameters and slaughter performance.

Results & Conclusion: Adding herbal medicine increased the feed intake ($P < 0.05$). Antibiotics increased the half eviscerated carcass ratio and eviscerated carcass ratio ($P < 0.05$). The wing muscle ratio and the leg muscle ratio of herbal medicine group were higher in compare to antibiotic group ($P < 0.05$). Both herbal medicine and antibiotics increased the low-density lipoprotein cholesterol (LDL-C) ($P < 0.05$). Herbal medicine could improve growth performance and slaughter performance better compared with antibiotics.

Keywords:*herbal medicine, antibiotics,pigeon, growth performance, slaughter performance*

Evaluation of albumin, total-protein and globulin in laying hens with poultry red mite in the northwest of Iran

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Objectives: The red mite or Dermanyssus gallinae has been described as a threat to laying hens for ten years.Nowadays, the importance of red mite in medical and veterinary sciences has been known as a vector for other disease. Red mite contamination in sites with high prevalence is a serious concern for the economy and human health, and animal health. The aim of this study was to evaluate albumin, total-protein and globulin in the patients.

Methods & Materials: 15 laying flocks and 5 control flocks from each farm and 15 blood samples have been collected. Using alcohol-impregnated cotton, a thin head syringe (to avoid severe bleeding at the site), in a plastic tube without anticoagulant material 2cc of blood from each case have been collected and then tested with serum or plasma by pars azmoon kit. The results has been analyzed by spss software and statistical analysis.

Result & Conclusion:In the infected group, the significantdecrease has been observed in albumin, total-protein and globulin protein than control group.

Keywords: Red mite, Dermanyssus gallinae, Laying hens, Albumin, Total-protein, Globulin.

Evaluation of Hematological factors in layer hens with red mite in the northwest of Iran

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Objectives: The red mite or Dermanyssus gallinae has been described as a threat to laying hens for ten years. Nowadays, the importance of red mite in medical and veterinary sciences has been known as a vector for other disease. Red mite contamination in areas with high prevalence is a serious concern for the economy and human health and animal health. In this study, the amount of hematologic factors in poultry infected with this mite have been investigated.

Methods & materials:15 laying flocks and 5 control flocks from each farm and 15 blood samples have been collected. Using alcohol-impregnated cotton, a thin head syringe (to avoid severe bleeding at the site), in a plastic tube with anticoagulant material (EDTA) 2cc of blood from each case have been collected, then tested the number of erythrocytes, leukocytes, and hb, pcv, mcv and mch have been measured. The results have been analyzed by spss software and statistical analysis.

Result & conclusion: The number of RBC, hb, pcv, mcv and mch have been decreased significantly in the infected group compared to the control group.And also the number of white blood cells in infected birds showed a significant increase compared to the control group.

Keywords: Red mite, Dermanyssus gallinae, Laying hens, Hematological factors.

Nanotechnology progress in increasing the production of laying poultries: Meta-analysis of articles published until 2020

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Objective: The field of nanotechnology has been developing rapidly since 1974, when it was invented to assemble novel materials with diameters of 1 to 100 nanometers. Nanotechnology and nanoscience have played an increasingly important role in veterinary medicine over the past decade, particularly in diagnosis, prevention and therapy, breeding and reproduction, animal nutrition, and food safety. A growing number of studies are examining the potential for nanomaterials to be used in poultry nutrition. Various nanomaterials could improve poultry and animal products, including quality, processing, packaging, and commercialization. This study aims to investigate the effects of different nanoparticles on the quality and quantity of eggs in laying poultries, which will be mentioned in this article.

Materials & Methods: The applications of nanotechnology in the poultry industry sector vary and are massive. Three databases (Google Scholar, PubMed, and Scopus) were searched for published articles on nanotechnology applications in increasing the production of laying poultries from 2012 to 2022. Twenty related articles with complete abstracts were included in this study. All data were analyzed with R version 4.2.1 artificial intelligence software.

Results & Conclusion: According to the results, the most studied NPs in poultry field research are copper (Cu) NPs, followed by zinc, zinc oxide, selenium, gold, and silver NPs. To a lesser extent comes other NP formulations, such as chromium and chitosan. Rapid and specific disease diagnosis, immuno-stimulation, improvement of production parameters in broilers and layers, microbial inhibition and disinfection are the most common applications of NPs in poultry. According to the analyzed findings, the regular inclusion of nano-supplements to fortify livestock feed is likely soon; however, it will take longer for nanoparticles to fully replace antibiotics in feed as many biocidal candidates must still be tested in vivo before undergoing clinical trials and food safety tests.Current knowledge of the effectiveness of NP against key poultry pathogens provides opportunities for the poultry industry to utilize nano-science to develop healthy, efficient, and safe poultry products. According to previous studies, using different nanoparticles in the diet of laying poultry helps to increase the production and improve the quality characteristics of eggs.

Keywords: Nanotechnology, poultry, layer poultry, Prevention, treatment.

Significant development of nanotechnology in improving the treatment of poultries bacterial infections: Meta-Analysis of published articlestill 2022

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Objective: The ideas that seeded nanotechnology were first mentioned in 1959 by renowned physicist Richard Feynman. Nanotechnology is a rising era with great capacity and numerous applications in human health, agriculture, and animal nutrition packages. The improvement of nanoparticles (NPs), particularly liposomes, polymeric nanoparticles, solid lipid nanoparticles, Nano gels, and inorganic nanoparticles, are gaining traction and terrific tools for overcoming the medicinal issue followed by bacteria. Dietary supplementation with nanoparticles plays a regulatory role in maintaining growth performance, feed conversion ratio (FCR), antioxidant defense, and microbial control. Moreover, potential applications and various aspects of using nano-trace minerals in different poultry species with possible effects on the performance and health of birds are discussed.Therefore, in this Meta-Analysis, nanoparticles' current progress and challenges in enhancing bacterial therapy are focused stepwise. The present study highlights the growth performance, antioxidant defense, and anti-bacterial potentiality of NPs in poultry and provides insight into their significance in the poultry industry.

Materials & Methods: Three databases (Google Scholar, PubMed, and Scopus) were searched for published articles on nanotechnology applications on growth promoter, antioxidant and anti-bacterial potentials in the productivity of poultry from 2015to 2022.Eighteen related articles with complete abstracts were included in this study.

Results & Conclusion: Based on the results, there are many studied NPs in poultry field research, such as copper (Cu) NPs, followed by zinc, zinc oxide, selenium, gold, and silver NPs. The supplementation of animal diet with elements such as copper, silver, zinc, gold, selenium, chromium, or calcium in nano-form positively affects livestock and poultry performance, productivity, and health.Our results concluded that The dietary supplementation of ZnO NPs can reduce bacterial-induced negative effects of FPD in broilers. Since silver compounds are known for their antimicrobial properties, silver nanoparticles are a potential antimicrobial feed additive. Silver nanoparticles show inhibitory effects on various species of bacteria, including *Escherichia coli* and *Staphylococcus aureus*. The importance of Cu in the animal diet physicochemical and biological properties of Cu NPs (nutritional and physiological characteristics, antibacterial activity, immunological and toxicological effects) were described in reviews.The antimicrobial effect against key pathogens of concern to the poultry industry indicates that there are opportunities for the poultry industry to benefit from nanoscience. Continuing research and development into Nano-enabled control strategies will undoubtedly provide opportunities for the poultry industry to benefit from nanoscience.

Keywords: Antibacterial, Nanotechnology, Nanoparticles, Poultry, Treatment.

Effects of Tannin-based Herbal Formulationson Treatment of Avian Trichomoniasis

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Objective:Avian trichomoniasis is a high-cost diseasein the poultry industry, among other infections.This infection is distributed worldwide among wild and domestic birds, particularly the order of Columbiformes (pigeons and doves).Extracts of herbal plants do not result in drug resistance or tissue remnants; therefore, they are a reliable and safe substitute for treating trichomoniasis. This study assesses the antitrichomonal properties of 2 herbal plants complex (*Quercus infectoria*and *Allium Sativum*) in pigeons compared to Metronidazole.

Materials & Methods: In this experiment, 32 birds usedanddivided into four equally numbered groups with four replicates in each group. Except for group (D), all groups were experimentally infected with *Trichomonas gallinae*. We used an herbal mixture to treat Group (A), and Metronidazole was given to Group (B).Our positive control group (C) was experimentally infected with *T. gallinae* but not treated. Our negative control group (D) was healthy throughout the experiment. The experiment included performance index, weight gain, wet mount, and biochemical & hematological examination.

Results & Conclusion: Results showed that treatment with an herbal complex remarkably decreased the adverse pathogenic effects of *Trichomonas* spp., compared to Metronidazole. After treating group (A) for one weak, birds become almost healthy and, on some levels, better than the metronidazole treatment group.One week of hematological post-treatment studies showed that Hypochromic anemia annoyed the positive control group's squabs with macrocytic and protected groups (A) and (B) revealed regular blood images.Evident eosinophilia and basophilia occurred in infected groups, but after treatment in groups (A) and (B), eosinophil and basophil counts decreased.All the data analysis on weight gain, ALT, and total leukocyte showed perfect results of the herbal mixture. The weight gain was significantly higher in groups A, B, and D compared to group C, but no difference was observed between treated groups. To conclude, the antitrichomonal properties of the mentioned herbal compound suggest its usage as a different antitrichomonal substance to chemotherapeutical medicine for the control of trichomoniasis.

Keywords: Control,Herb, Pigeon,Tannin, *Trichomonas gallinae*.

Histomorphological study of the brain of domestic turkey

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Objectives: The purposeof this study was to evaluate the morphological and histological features of the brain of a domestic turkey (Meleagris gallopavo f. Domestica) to identify its tissue structure.

Materials & Methods: Five turkeys were obtained from the turkey farm and the birds were euthanized with ketamine hydrochloride and midazolam (60 and 4 mg/kg respectively) and then their heads were removed and sent to the laboratory(Faculty of Veterinary Medicine, Razi University of Kermanshah) . The brain was separated from the skull and after morphological evaluation and taking pictures of the dorsal and ventral surfaces of the brain, it was cut from the middle line between the two hemispheres and placed in 10% buffered formalin. Then, the fixed samples were placed in the Autotechnicon (tissue processor) and after molding with paraffin, sections with a thickness of 5 micrometers were prepared and stained with hematoxylin and eosinthen they were studied using an optical microscope (Olympus).

Results & Conclusion: In terms of morphology, the turkey brain is trapezoidal and has a large pear-shaped hemisphere, and in terms of histology, the brain consists of two regions, pallium and subpallium. The cerebral cortex consists of 4 layers: the hyperpallium, the dorsolateral corticoid region, the hippocampus, and the piriform cortex. Unfortunately, the basic structure of the tissues and organs of birds is similar to mammals, but in terms of morphology and physiology, they have special characteristics that are completely different from mammals in some cases.

Keywords: Brain, Cerebellum, Histology, Morphology, Turkey

Prevalence of gastrointestinal helminths of native hen in Iran: Meta-analysis from 2007 to 2020

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Objective: Gastrointestinal helminths due to establishing a parasite relationship and,as a result,reducing the food conversion factor reduces the weight gain of broiler chickens, leading to reduce the percentage of weight gain of broiler chickens,reducing the age of laying and reducing the number of eggs laid by laying hens.Since chicken meat provides a significant percentage of the protein consumed by society, the prevalence of these parasites harms the poultry industry, the economy, and the welfare of society. Our goal in conducting this meta-analysis study is to investigate the prevalence of gastrointestinal helminth parasites in native Iranian hens. According to the results of this article, these parasitic infections can be controlled and prevented with more precise planning.

Method and Materials: In this study, 25 articles on the prevalence and types of native hens'gastrointestinal helminths in Iran were collected from three databases (Google Scholar and Scopus PubMed) from 2005 to 2020. The data obtained from different regions of the country with different climates, including Mashhad, Gorgan, Urmia, Isfahan, and Kerman, were analyzed with artificial intelligence software R version 4.2.1. The confidence interval in this article is 95%.

Results and conclusion: The meta-analysis of the data on the prevalence of gastrointestinal helminths showed us that *Ascaridaegalli* parasites, with an average prevalence of 34%, and *Heterakis gallinarum*, with an average prevalence of 31%, had the highest percentage of prevalence amongother gastrointestinal helminths.It is worth mentioning that for the humid climate in the north of the country, the prevalence of parasites is higher than in other parts of the country, and the prevalence of *Heterakis gallinarum* is significantly higher than *Ascaridae galli*. Therefore, more attention should be paid to histomoniasis in the northern regions. In addition,considering the negative impact these two parasites have on the reduction of production efficiency and productivity of the poultry industry and community welfare, veterinarians and breeders should plan for control, prevention, and treatment with new methods.

Keywords: Prevalence, Gastrointestinal helminths, Poultry, Iran, Meta-analysis

Seroprevalence survey of Toxoplasma Gondii in poultry by Enzyme-Linked Immunosorbent Assay (ELISA) in Qazvin province

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Backgroung&objectives: ToxoplasmaGondii infection is one of the most common parasitic infections in humans and other warm-blooded animals. Like other warm-blooded animals, birds can host toxoplasma. In Iran, the infection of this protozoa in humans and some animals has been reported that the role of livestock in the storage and transmission of contamination has been somewhat studied. Due to the specific conditions of the climate and the availability of conditions for the transmission and the cycle of this parasite in the nature of Qazvin province, determining the condition of this disease is very important in the native poultry population of the province.

Methods: For this purpose, a cross-sectional descriptive study was conducted to determine the seroepidemiology of Toxoplasma in a native population of Qazvin province. A total of 232 blood samples were collected from poultry (168 samples) and cousin (64) from 5 counties. Serum samples were analyzed by indirect ELISA method and the results were calculated based on the ratio of the percentage of light absorption of the serum to the control.

Results: According to the results obtained from all of the tested specimens, 48.43% of the specimens were infected with positive antibody titers above SP> 50.

Conclusion: Among the province's cities, the city of Boeing Zahra has 40% of the highest and the water city with 27 91.9% has the least pollution, probably due to the specific climate conditions in these two cities. The infection rate in chicken was 36.9% and the infection rate was 28.28%, and this difference was statistically significant between males and females ($p < 0.05$).

Key words: Toxoplasmosis, Poultry, ELISA, Qazvin

Investigating the preventive effect of herbal medicine,Against Coccidiosis in Broilers

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Objective: Coccidiosis is an acute disease in the poultry industry worldwide. The present study aims to evaluate the effectiveness of an herbal mixture (*Artemisia Annua* and *Quercus infectoria*) in preventing coccidiosis. Artemisinin has been shown to induce oxidative stress in parasite cells and directly inhibit sporulation and cell wall formation in Eimeria species. *Quercus infectoria* has medicinal effects such as anti-inflammatory, astringent, antidiabetic, antimicrobial, and gastroprotective.

Materials & Methods: 120 one-day-old Ross 308 broiler chickens were purchased and reared under standard management practice with free access to feed and water. Toward the finish of the second week, the birds were moved from the litter to the cages and randomly gathered in groups. Each bird in groups A, B, and C were challenged via oral gavage with 200,000 sporulated oocysts of the prepared *Eimeria* spp. Group (A) takes an herbal mixture. Group (B) was treated whit Monensin. Group C did not receive any treatment. Group (D) was not infected and was healthy all the experiment period. To assess coccidial oocyst shed by chickens, oocyst per gram of feces (OPG) was counted using the McMaster method on days 5, 7, 9, and 11 after the challenge. On day seven after the challenge, lesion scoring was performed using Johnson & Reid method. For this reason, three birds from each replicate were slaughtered and evaluated for gastrointestinal lesions.

Results & Conclusion: As a result,Clinical signs of infection were improved in treated groups. The weighting and mortality rates of groups A and B were almost the same, and there was no significant difference, and Group C had the lowest weight gain. The feed conversion ratio in groups A,B, and D was significantly less than in group C.Also, in the grading of intestinal lesions, group A, which was treated with an herbal mixture, performed better than the group treated with Monensin.Oocyst count was significantly lower in treated groups, and no significant difference was seen between these groups.According to the results of this research, the herbal mixture can be a natural and safe alternative to chemical anti-coccidiosis drugs such as Monensin.

Keywords: Broilers, Coccidiosis; Herbal mixture; Prevention, treatment.

Advantages of artificial insemination on industrial poultry egg fertilization: Meta-analysis of published articles till 2022

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Objective: Artificial insemination has been a landmark procedure in improving animal agriculture over the past 150 years. Since the 1950s, AI has been used in commercial poultry production, initially in Australia and followed by the USA. AI technology use in poultry production has enabled the immediate dissemination of genetic material from a short number of superior males to a high number of females. AI can obtain excellent fertility in poultry compared to natural mating. Successful application of this technique needs acceptable quality semen that should be inseminated very close to the sperm storage tubules in the female to obtain optimum fertility in chicken. The efficiency of Al in poultry depends on the dose of sperm, sperm quality, motility, and inseminating activity of spermatozoa. This analysis seeks to determine the effects of artificial insemination applied at different times on fertilization in industrial poultry breeding.

Materials & Methods: Three databases (Google Scholar, PubMed, and Scopus) were searched for published articles on Al techniques and their effects on egg fertility in different poultry species from 2019 to 2022. Twenty-two related articles with complete abstracts were included in this study.Data were analyzed with artificial intelligence software R version 4.2.1. The confidence interval in this article is 95%.

Results & Conclusion: Higher fertility of eggs is because the new environment contributes to the preservation of the fertilizing ability of sperm, not only in vitro but also in the oviduct of females. The proposed biotechnological environment allows us to extend the collection of hatching eggs after each insemination and increase the intervals between subsequent insemination by 1-2 days. This reduces the number of insemination and reduces labor costs in obtaining incubation eggs by 10−15%. Dilution of the low and dense volume of avian semen is essential for handling and storage, and chicken semen typically requires a two to three-fold dilution. Collected samples should be preserved at 2-8°C for avian species, ideally with turkey sperm stored at 4-8°C and chicken semen at 7-8°C for suitable fertility. Dilution of sperm provides fertilizing ability in the genital tract of females of all types of poultry by extending the viability of sperm and reducing their enzymatic constant.Artificial insemination (AI) may provide a viable solution to improve fertility while reducing the number of males on farms by inseminating a more significant number of females with semen from fewer strongly selected males.

Keywords: Artificial insemination, poultry, breeding, egg, fertility.

The effect of dietary L-tryptophan deficiency on the plasma level of 5-hydroxyindoleacetic acid and the amount of food intake in broilers.

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Objective: Different factors play a role in controlling food intake in broiler chickens, and researchers and experts have always been trying to improve the amount of food intake and conversion rate by using new methods. In this research study, the aim is to investigate the effect of L-tryptophan deficiency in broiler chickens as one of the components required for growth in the diet on the amount of food intake and 5-HIAA metabolite. Determining the adequate amount of oral tryptophan is much more complicated than identifying its physiological importance, and the amount of tryptophan suggested by the NRC in 1994 was 0.20% from 0 to 3 weeks of age.

Material & Methods: In this study, 72 one-day- old Ross 308 male broiler chicks were divided into three groups receiving tryptophan in amounts of 0.12%, 0.16% and 0.20% in three replicates and kept for 21 days. And daily, the amount of food intake was measured in the groups, and at the age of 11 and 21 days, blood was taken from the wing vein, and the plasma level of 5-HIAA was measured by ELISA method.

Results & Conclusion : It was found that, the amount of plasma 5-HIAA decreased significantly ($P<0.05$) with the decrease of tryptophan in the diet at the age of 11 and 21 days, The amount of food intake also showed a significant decrease with the decrease of tryptophan at the ages of 11 and 21 days ($P<0.05$).

The plasma 5-Hydroxyindole acetic acid as the primary metabolite of serotonin indicates the changes of serotonin in the nervous system and the decrease of plasma 5-HIAA is caused by the decrease of brain serotonin and cerebral serotonin is known as one of the important neurotransmitters in food intake, which is influenced by the dietary L-tryptophan.

Key words: Broiler, L-tryptophan, 5-hydroxyindoleacetic acid, food intake

Significant development of Mesenchymal Stem Cell therapy in chickens: Meta-Analysis of published articles till 2022

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Objective: Mesenchymal stem cells (MSCs) are multipotent stem cells capable of differentiation into fat, muscle, bone,and closely related lineages and express specific and unique cell surface markers. They can be used as an avian culture model better to understand myogenic, adipogenic, and osteogenic pathways. Moreover, MSCs could also be used as a model to study various physiological and developmental processes in avian and other species. They are helpful for better understanding the pathogenic potential of the mineralization during osteogenesis, infectious bursal disease virus, and interactions between MSCs as a feeder layer to other cells. MSCs are also crucial for immunomodulatory cell therapy.This meta-analysis summarizes current knowledge about the general characterization of MSCs and their application in chickens.

Materials & Methods: Three databases (Google Scholar, PubMed, and Scopus) were searched for published articles on Mesenchymal Stem Cell therapy in chickens from 2015 to 2022. Eighteen related articles with complete abstracts were included in this study. Diseases like chicken dermatitis and Infectious Bursal Disease Virus have been analyzed with a 95%confidence interval.

Results & Conclusion: Based on the results, bone marrow-derived MSCs (BM-MSCs) in coculture with hematopoietic progenitor/stem cells (HPCs/HSCs) can helpregulate and expand the hematopoiesis process using the 3D-culture system in future research. Based on our meta-analysis results, MSCs' several advantages, including strong proliferation, immune-modulatory properties, and ready availability, make them a suitable model in stem cell research.MSCs can reduce cell injury by the synergistic action of small molecules and extracellular vesicles secreted by MSCs to maintain tissue homeostasis. Studying the physiological functions of MSCs can improve their application in regenerative medicine and increase our knowledge to understand their biological behavior better. The key characteristics defining MSCs have been their capacity for colony formation, the potential for self-renewal, expression of surface markers, and multi-lineage differentiation.Based on these findings, we may conclude that MSCs can provide a helpful model in the chicken stem cell research field.

Keywords: Mesenchymal Stem Cell, therapy, chickens, Meta-Analysis,Poultry, Bone-marrow.

First report of hepatitis-hydropericardium syndromeby Fowl Adenovirus innative hens

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Objectives: Adenoviruses are common infectious agents of chicken, turkey, and quail. Inclusion body hepatitis (IBH), hepatitis–hydropericardium syndrome (HHS), and adenovirus gizzard erosion (AGE)causedby Fowl adenovirus (FAdV). To our knowledge, HHS has not been observed in a native hen flock in Iran.

Materials&Methods: Three 6-month-old native henswere referred for postmortem examination to veterinary clinic of Ferdowsi University of Mashhadfollowing a 1-day history of lethargy and mortality.Some of macroscopic lesions were observed includinghydronephrosis, splenomegaly,hydropericard, hepatic bleeding and necrosis, given in the order of severity. In order to accuratelydetermine cause of death in the flock,histopathological method was applied for detection of the infection.The heart, kidney, spleen, and liver tissue samples were sent to pathology laboratory.

Results &Conclusion: In the histopathological investigations, lymphocytic hepatitis, basophilic intranuclear inclusion bodies in hepatocytes, severe hemorrhage in kidneys, and lymphocytic myocarditis were evident.Necropsy findings were suggestive of adenovirus infection. However,in this case, theadenovirus was not isolatedsuccessfully.This is the first report ofFowl adenovirustype A-associated HHS in the native hens of Mashhad, Iran.

Keywords: Hepatitis–hydropericardium syndrome, HHS, Adenovirus, native hen, Mashhad.

Report of a new meq gene size: The first study on genetic characterisation of Marek's disease viruses circulating in Iranian commercial layer and backyard chicken

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In recent months, several outbreaks with clinical signs of MDV-1 were reported in Iranian parent and laying hen farms, in addition to backyard chickens. Several meq gene sequences from these outbreaks were amplified and molecularly characterised.The meq protein sequences revealed three different sizes, namely the standard 339 aa, a shorter form of 338 aa lacking a proline residue at position 191, and a very short (vs) size of 265 aa. Based on sequence and size, the 265 aa meq has never been reported from international research groups before. The protein has only one PPPP repeat motif suggesting it belongs to a highly virulent strain.The standard meq sequences showed 100% BLAST identity to the vv+ isolate Polen5. However, the 338 aa form clustered to the clade usually reported from North America.This is the first report on genetic analysis of MDV-1 from Iran, but further study is required to obtain a better picture of the diversity and prevalence of different MDV-1 strains circulating in the country's farms, backyard poultry and other bird species.

Backyard turkey; Chicken farms; Iran; Marek's disease; Meq gene; PPPP; Virulence

Radiographic diagnosis of foreign body in mynagizzard and its successful surgery, A Case Report

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Objectives: There are different types of foreign bodies that can be detected in the digestive system. Some foreign bodies can be easily seen and recognized in radiography due to their metallic nature, but some others cannot be recognized in radiography due to the fact that they are similar to other digestive substances and soft tissue that make up the digestive tract.In this report, we will examine the diagnosis and surgical treatment of a case with a non-metallic foreign body (hair band) diagnosed in the gizzard of a myna**.**

Materials & Methods:A 3/5 years old common myna wasrefferdto the hospital with symptoms of vomiting and dyspnea,these symptoms were observed two days before going to the hospital and had become more severe during these two days.the ownerreaported the myna, there was a possibility of eating hair band and physical examination looked normal.

Results &Conclusion: PlainRadiographs was taken from the lateral and ventrodorsal views. the radiographs show:Normal bone opacity, abnormal gas pattern in small intestine loops, abnormal distention of gizzard, Hepatomegaly, Normal air sacs.in result of physical examination and radiograph a high probability for mechanical obstruction was reported. And then radiography with double contrastwas done to confirm the diagnosisis.In the double contrast radiograph, which was taken after 12 hours of giving the double contrast material, a large amount of that remained in the gizzard, while the contrast material was drained in other parts of the digestive tract. These signs confirmed the presence of foreign body in the gizzard.the bird was given ringer`s solution and anesthetized with isoflurane and oxygen, placed in dorsal recumbency with the head raised about 30 degrees on a heating pad. surgical site prepared aseptically using povidone iodine solution and alcohol. surgery was performed to remove the foreign body from the gizzard with a ventral midline approach from the tip of the xyphoid and extended caudally.The skin and linea alba were incised separately.During this surgery, the hair band was found inside the gizzard and was successfully removed.Thegizzard incision was sutured in two continuous layers then the linea alba and skin were closed separately by a simple continuous.

Postoperative management consisted of diet modification and enrofloxacin for seven days. After surgery no complication was observed.

Keywords: Foreign body, Myna, Gizzard, Radiography, Surgery

Study of the frequency of gastrointestinal helminths in a pigeon in Zabol city

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Objective: Pigeons are birds of worldwide distribution kept and bred for entertainment or as a food source. Like other birds, pigeons are infected with helminths, protozoans, and ectoparasites. This study aimed to determine the frequency of helminth parasites in the gastrointestinal system of pigeons in Zabol city.

Materials & Methods: in the present study, 220 samples of the gastrointestinal system of dead sick pigeons from different parts of Zabol city were examined. For this purpose, each piece of the alimentary canal was washed using PBS, and the intestines' membrane was scraped using a scalpel. Then, using a stereo microscope, the contents were examined carefully for the presence of helminths in Petri dishes. The collectedhelminths were cleared with Lacto phenol. Some isolated cestodes were stained with the carmine-acid method and mounted using Canada balsam. The isolated helminths wereidentified under 10 x and 40 x magnification light microscopes based on appropriate keys.

Results & Conclusion: The results showed that the frequency of infection was 43.63%,including 52 infected with cestodes, 14 infected with nematodes, and 31 pigeons infected with cestodes and nematodes. The species and frequency of infection with cestodes were as follows:*Raillietinatetragona* (91.46%), *Raillietinaechinobothrida*(26.82%),*Raillietinacesticillus*(1.21%),*Raillietinamagninumida*(13.41%), *andCotugniadignopora*(78.7%).The species and frequency of nematode infection were reported as *Ascaridiacolumbae* (37.77%), *Hegeliatruncata*(68.88%),*Eulimdanaclava* (8.88%), and *Heterakisgallinarum* (4.44%).

The results showed that despite the relatively hot and dry weather conditions, the infection with cestodes and nematodes in Zabulcity is high. Therefore, a control and prevention program should be considered to reduce the effects of these parasites on the pigeon's health and their transmission to other native birds in the region.

Keywords: Helminth, Nematode, Cestode, Pigeon, Zabol, gastrointestinal system

The first report of infestation by *Pseudolynchia Canariensis* in Monk parakeet

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Materials & Methods:A blue Monk parakeet (*Myiopsitta monachus*)with unknown age and gender was referred to Division of Avian Medicine of the Veterinary Faculty, Shahrekord University.The bird was kept as a pet and was completely free at home and There were no other birds in the house. The bird was recently purchased from a pet shop, so no reliable information about its history was available;However, for the past few days, the bird had been fed with millet, flax, safflower seeds, sunflower seeds, fruits and vegetables;The ambient temperature was about 27°C. at distance examination, the bird appeared lethargic and eyes were closed.At further examination,the mucous surface was pale and wounds were observed at dorsal surface of distal part of wings.after examination with loop, an external parasite was found at the wound site, which was carefully detached from the wound site and was referred to the parasitology Medicine of the Veterinary Faculty, Shahrekord University.

Results & Conclusion: At macroscopic and microscopic examination, only one cross-vein was found on wings. The length of a palpi was more than twice the width. Median length of scutellum is about the distance between bases of scutellar setae. Posterior margin of scutellum is more or less straight. According to the findings, the sample was diagnosed as *Pseudolynchia Canariensis.*

Keywords: monk parakeet, P. Canariensis, external parasite

The investigation of suspected cases of colibacillosis by antibiogram and the determination of the resistance profile in broiler chickens referred to sadra veterinary laboratory

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Objectives: Escherichia coli bacteria caused colibacillosis in birds and occurs in most species of domestic birds at different ages. This disease causes significant economic damage to the poultry industry every year. Dealing with this disease relies on the use of antibiotics. Improper and indiscriminate use of various antibiotics has caused Escherichia coli resistance to these compounds.

Materials & methods: samples were taken from the pericardial cavity and liver of suspected cases of colibacillosis In order to isolate a single bacterial colony, the sample was cultured on EMB medium, and the presence of Escherichia was proved by carrying out subtraction tests and cultivation on TSI and SIM media. the agent was transferred to Mueller-Hilton medium and after placing the relevant antibiotic discs, the results were reported with sensitive, semi-sensitive and resistant scales.

Results & Conclusion: The comparison of the drug resistance of the isolates of this study shows that Lincospectin 84.7%, Gentamicin 77% and Fosfomycin with 69.2% sensitivity are among the most effective antibiotics against Escherichia coli and compounds such as ciprofloxacin 84.8%, enrofloxacin 80.7% and doxycycline with 73.1% resistance were the most ineffective antibiotics on Escherichia coli in this region. Considering the large economic losses caused by colibacillosis due to antibiotics resistance in the poultry industry, antibiogram should be used to select and use the appropriate antibiotic to prevent the development and spread of drug resistance.

Keywords: Escherichia coli, antibiogram, drug resistance, colibacillosis

A case report of gout and related encephalopathy in *Indian peafowl*

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Materials & Methods:A deadfemale *Indian peafowl* (*Pavo cristatus*) with 6 months age was presented to the Division of Avian Medicine of the Veterinary Faculty, Shahrekord University. The bird was dead suddenly and before that, the bird had not shown any symptoms of illness. The bird was kept in multi species enclosure with a shared water and food container.All birds were fed by corn-soy based diet that was supplemented by sorghum, wheat and egg layer pellets.The examination of the carcass began with the examination of the skin and external structures. All external structures had a normal appearance, except the ankle joint, where urate deposits were identified.after examination of integument, Internal structures were evaluated; Urate deposition was observed on the heart; Also, the kidneys were large and marbleization in the kidney was visible. The pathology sample was taken from the kidney and kept in 10% formalin until sent to the laboratory;then paraffin embedded, sectioned, and stained with *hematoxylin and eosin* for light microscopic examination.On the microscopical observation, Urate deposition and bleeding were observed in the renal tubules. Loss of the integrity of the basement membrane and its rupture withtubular necrosis wasindicated goat.Histopathological examination of the brain revealed the presence of edema and hyperemia, and dead neurons were visible, which can be related to encephalopathy caused by dehydration.

Results & Conclusion: Although the primary cause of gout has not been determined, the high density of the enclosure, the presence of invasive species such as cranes, as well as limited access to the water container, may account for the lack of access to adequate water.

Keywords: Indian peafowl, gout, encephalopathy

A case report of sclerotic osteosarcoma in Fischer's lovebird

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Materials & Methods:A three-years female Fischer's lovebird (*Agapornis fischeri*) was referred to the Division of Avian Medicine of the Veterinary Faculty, Shahrekord University for a history oflong timesrespiratory distress, Inability to stand on perch and chronic egg laying. the bird was feed by seed, fruit, vegetable and nuts. The bird was treated with Enrofloxacin (10 mg/kg posid for 7 days) and Calcium supplement (100mg/kg po SID for 10 days) but there was no improvement. In the physical examination, a mass was palpated on the left side ofdistal part of sternum.The consistency of the mass was hard and similar to bone. For further evaluation, radiographs were prepared in lateral and ventrodorsal projections. Ventrodorsal radiograph showed radiopacity area on left coelomic cavity as well as the right lung. Lateral view revealed radiopacity area in sternum and spinal cord.Due to the presence of bone mass in different parts of body, disease progression, severe respiratory distress and the inability to perch, it was decided to euthanize with a high dose of ketamine.In the autopsy, bone masses were observed all over the coelomic cavity. For further evaluation, lung, liver, spleen and bone mass were sampled. The sample was transferred to 10% formalin and referred to Division of Pathology of the Veterinary Faculty, Shahrekord University;then, Hematoxylin and Eosin staining was performed.

Results & Conclusion: No pathologic signs were found in liver and spleen. In the lung tissue, fibrinoid reaction was observed in the vicinity of the vessels. The sample taken from the bone mass indicated the sclerotic osteosarcoma.

Keywords:lovebird, sclerotic osteosarcoma

A case report of the diagnosis and successful treatment of a Mynah bird with liver disease

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Materials & Methods:A 4 years old Common mynah (*Acridotherestristis*) with unknown gender was referred to Veterinary Clinic of Shahrekord University with lethargy and incoordination. The bird was fed by table food, commercial pellet anddried mealworm. In the physical examination, body condition score was evaluated about 2.5 and the weight of the bird was 95 grams. The liver was markedly enlarged and palpable behind the terminal part of sternum.The bird was treated with Enrofloxacin (15mg/kg SID for 7 days) but no improvement was achieved.in order to collect blood sample, right brachial vein was preferred, then overlying feather was plucked. Blood sample was collected by needle gauge 22. To reduce bleeding, 1 ccisotonic serum was injected subcutaneously at the blood sampling site.Blood test results showed a three-fold increase in *Alanine aminotransferase* (The normal range is 5-12 U/L, which in this case was 34U/L.), while Creatine kinase was in the normal range.Based on the clinical and laboratory findings, the treatment was started with Liver Gol (70mg/100 ml drinking water for 14 days) and Vitamin B1 (25mg/100 ml drinking waterfor 14 days). On day 20, the bird was more active, incoordination of movements had improved;Although, not completely.At this time, bird's weight was increased 7 grams.Due to the positive treatment process, the treatment was continued for another 20 days. On the 40th day of treatment, the follow-up of the patient indicated an acceptable recovery of the bird.

Results & Conclusion: Mynah birds are omnivorous but in captive they also eat commercial pellets and table food so they may suffer from metabolic diseases more than other birds; Therefore, use of diagnosing tests are important in treatment.

Keywords: Common mynah, *Alanine aminotransferase*, hepatic diseases

Effects of *Thymus kotschyanus*on Broiler Chickens Infected with *Eimeria tenella*

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Objectives: Coccidiosis is one of the most economically devastating enteric diseases for the poultry industry worldwide.*Eimeriatenella* is an important cause of coccidiosis in chickens, causing cecal coccidiosis, high morbidity and mortality rates and economic losses. Recently, Eimeria species seemed to become more resistant against common drugs used to prevent and control coccidiosis (coccidiostats that have been reported to have a potential for extenuating coccidiosis. Effects of a plant extract on broiler chickens infected with E. *tenella*is reported here.

Materials and Methods:A total number of180 broiler chickens (Ross308)were divided into 6 treatment groups at 14 days of age.Each treatment group consisted of 3 replicates, each containing 10 an). Furthermore, the remaining of these drugs is an important issue for human's health and food safety. Therefore, finding suitable alternativesis an important challenge. Herbal compounds are groups of feed additives imals. Chickens in 5 groups were experimentally infected with 3×10^4 sporulated oocysts of *Eimeria tenella* at 14th day of age. Groups include: not infected and no drug or herbal extract was given (C-), infected and no drug or herbal extract was given (C+), infected and ethanolic extract of*Thymus kotschyanus* was added to drinking water of 3 treatment groups from day 1 to 35 of rearing for 8 hours/day at rates of 0.05% (G1), 0.1% (G2) and 0.2% (G3) and the anticoccidial drug (lasalocid sodium) were administered at 75 mg/kg for the drug treatment group(G4). Throughout the experimental period from day 1 to day 35, performance parameters including body weight gain, feed intake, feed conversion ratio, mortality, cecal lesion score and bloody diarrhea were recorded.

Results and Conclusion: Dietary supplementation with T.*kotschyanus*attainedhigher body weight gain and lower feed conversion ratio values than the C+ group. The G4 and C- groups exhibited bodyweight gain and feed conversion ratio values that did not significantly differ from each other, andwere significantly better than all the T.*kotschyanus*treatment groups (G1, G2 and G3). Bloody diarrhea observed in all herbal treatment groupsexcept for the G3 where it was mild. The mortality and cecal lesion scores in the C+ group showed that using this plant extract had significant effects on these parameters. Results indicate that T.*kotschyanus*exerted anadmissible effect onE. *tenella* infection. This effect was, however, significantly lower than that exhibited by lasalocid sodium.

Keywords: Broiler Chicken, Coccidiosis, *Eimeriatenella*, Herbal Compounds, *Thymus kotschyanus*

The Role of *Eimeriatenella* Infection on Key Parameters in Performance of Broiler Chickens

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Objectives: Coccidiosis in chickens is caused by Eimeria species and causes great economic losses in poultry industry. *Eimeriatenella* is one of the most important species of Eimeria which damages the tissue of cecum and can reduce body weight, feed efficiency and intestinal health, because the cecum is the main site of volatile fatty acid production and accommodates harbors various pathogens.In order to develop appropriate methods to deal with *Eimeriatenella* infection in broiler chickens, an experimental infection model should be established.

Materials and Methods: For this purpose, different amounts of*Eimeriatenella*sporulated oocysts were inoculated into broiler chickens.In this study, 250 broiler chickens (fourteen-day-old Cobb500) were divided into 5 treatment groups. Each treatment group consisted of 5 replicates, each containing 10 animals.Five different dosages (T0: 0, T1: 6000, T2: 12,000, T3: 24,000, and T4: 48,000) of *Eimeriatenella* oocysts were inoculated via oral gavage.

ResultsandConclusion:The results showed that experimental infection with oocysts had a significant effect on performance and carcass traits of broiler chickens (p<0.05). The difference between treatment groups in terms of live weight characteristics on days 20, 30 and 40 of broilers was statistically significant (p<0.05). Live weight gain on days 30 and 40 was significantly determined (p<0.05). The feed conversion ratio was statistically significant in the treatment groups between weeks 1 and 5 of age (p<0.05). There was also a significant difference in carcass characteristics (p<0.05).The present study showed that *Eimeriatenella* infection impairs feed efficiency and intestinal health in broiler chickens, mainly by reducing cecal volatile fatty acid (VFA) production. Different levels of inoculation modulated the propensity for fecalscores and oocyst shedding at different points of time. Based on the results of this study, energy supplements and/or cecal microbiota modulation potentially improve the negative effects of *Eimeriatenella* infection in broilers.

Keywords: Broiler Chicken, Coccidiosis, *Eimeriatenella*, Feed Conversion Ratio, Performance

Influence of various dietary levels of stinging nettle powder on growth performance of broiler chickens subjected to chronic heat stress

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Objectives: A study was conducted to evaluate the effects of stinging nettle at various dietary levels (0, 2%, and 4% of diet) on body weight gain, feed intake, and food conversion ratio of broiler chickens exposed to chronic heat stress.

Materials and methods: In the present study, a total of 160 Arbor Acres broiler chickens (4 treatment groups; four replicates/treatment group; 10 birds/replicate) were used in a 29-day trial. The experimental groups are as follows: 1) control: no supplementary nettle and no heat stress; 2) HS: heat-stressed broiler fed by basal diet; 3) HS-SN2: heat-stressed broiler fed by 2% dietary stinging nettle; 4) HS-SN4: heat-stressed broilers fed by 4% stinging nettle. Nettle powder was added to the basal diet from days 14 to 29. The cyclic heat stress was induced from days 22 to 29.

Results and conclusions: on days 29, feed intake decreased in the HS group compared to the control group ($p < 0.05$). Dietary nettle at 2% and 4% increased feed intake in the HS-SN2 and HS-SN4 groups compared to the HS group at 29 days. Body weight gain and food conversion ratio in the HS group were lower than in the control group ($p < 0.05$) on days 29. Stinging nettle supplementation at 2% and 4% improved body weight gain ($p < 0.05$) in challenged groups. Stinging nettle powder positively affected food conversion ratio and feed efficiency ($p < 0.05$) in HS-SN2 and HS-SN4 groups compared to the HS group. No differences were observed among treatments received 2% and 4% stinging nettle in the measured parameters ($p > 0.05$). In conclusion, supplementation with stinging nettle at 2% and 4% level of diet had significant benefits on body weight gain, feed intake, and feed efficiency. Therefore, stinting nettle could be used as a feed additive in the poultry diet to improve health status and growth performance of broiler under heat stress.

Keywords: body weight gain, feed efficiency, stinging nettle, chronic heat stress, broilers.

Effect of dietary supplementation with stinging nettle powder on the physiological responses of broiler chickens challenged by chronic heat stress

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Objectives: This study was conducted to investigate the effect of supplementing broiler chicken diets with stinging nettle powder on rectal temperature and panting frequency in broilers subjected to chronic heat stress.

Materials and methods: The stinging nettle powder was supplemented in the diets at three different levels (0, 20000, and 40000 ppm) from 14 to 29 days. A total of 160 one-day-old broiler chicks (Arbor Acres strain) were selected and divided into four treatments (40 birds each) and four replicates based on a completely randomized design representing: basal diet with no supplement and no challenged by heat stress as negative control, basal diet with challenged by heat stress as positive control, basal diet containing 20000 ppm stinging nettle powder as ST2 group, and basal diet containing 40000 ppm stinging nettle powder as ST4 group. The birds were reared for 29 days. During the study, feed and water were provided ad libitum. The cyclic heat stress was induced from days 22 to 29.

Results and conclusion: Rectal temperature was higher in birds in the positive group than in the negative control on days 25 and 29 ($p < 0.05$). Exposure to chronic heat stress increased panting frequency in the positive control compared to the negative control on days 25 and 29 ($p < 0.05$). Inclusion of the stinging nettle at 20000 and 40000 ppm decreased the rectal temperature in the ST2 and ST4 groups compared to the positive control. The broilers fed the supplemented diet with 20000 and 40000 ppm stinging nettle had lower panting frequency than the positive control. Dietary intake of the stinging nettle regulates the physiological responses in heat-stressed chickens. No differences were observed among treatments received 20000 and 40000 ppm stinging nettle in the measured parameters ($p>0.05$). In conclusion, the stinging nettle powder can be utilized at a level of 20000 and 40000 ppm as a feed additive to attenuate the adverse effects of heat stress.

Keywords: stinging nettle, rectal temperature, panting frequency, chronic heat stress, broilers.

Evaluation of feed efficiency and growth parameters of healthy broilers fed with different levels of stinging nettle (*Urtica dioica*)

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Objectives: The effects of different levels of stinging nettle supplementation on the growth performance of Arbor Acres broiler chicks were evaluated.

Materials and methods: 120 one-day-old broiler chicks were randomly divided into three equal groups. The control group (G1) was fed a basal diet without supplementation. Groups 2 (G2) and 3 (G3) were fed the stinging nettle supplemented with 2% and 4% per kg of basal diet, respectively. The birds were reared for 29 days. During the study, feed and water were provided ad libitum. The studied birds were fed stinging nettle powder from days 14 to 29.

Results and conclusions: Over the experimental period, supplementing with stinging nettle in G2 and G3 groups led to an increase in final body weight compared to the control group. Stinging nettle supplementation at levels 2% and 4% significantly ($P<0.05$) increased final body weight (10% and 15%, respectively). Compared with the control group, birds fed 2% and 4% of stinging nettle showed higher weight gain by 9% and 14%, respectively. Stinging nettle supplementation non-significantly ($P>0.05$) increased feed intake in G2 and G3 groups compared to the control group. The feed conversion ratio improved in birds fed with a supplementary diet. In conclusion, stinging nettle supplementation stimulated chicken growth and improved feed efficiency in broilers. Therefore, these beneficial effects of stinging supplementation are valuable and can be used as a growth promotor in poultry production.

Keywords: Herbal additives, stinging nettle, growth performance, broiler.

Feeding extruded whole flaxseed as a source of linolenic acid in combination with various carriers to improve productive performance and egg quality of laying hens: A comparative study

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Objectives: Omega-3 fatty acids have recently gained attention since of their potential on increasing human health.Whole flaxseed contains 34 to 45% oil, and the high fat content can make problems duringstorageof grinded and extruded flaxseed. The aim of this study was to evaluate the nutritional effect of using wet-extruded full-fat flaxseed, as an important source of omega-3 alpha-linolenicacid (ALA),combined with soybean meal, sunflower meal or corn-gluten meal, as an oil-absorbent and carrier,on productive performance and fatty acid composition of table egg in commercial laying hens.

Materials &Methods: In a complete randomized design, 9treatments of 34-week-old whitelaying hens (LSL) with 5 replications each, and10birds in each replicate (cage) were fed for 8 weeks.Dietary treatments were control group(standard basal corn-soybeanmeal diet; T1), full-fat flaxseed (7.5 and 15% of diet; T2 and T3, respectively), full-fat flaxseed+soybean meal (7.5 and 15% of diet; T4 and T5, respectively), full-fat flaxseed+sunflower meal (7.5 and 15% of diet; T6 and T7, respectively), and full-fat flax+gluten meal (7.5 and 15% of diet; T8 and T9, respectively).Whole flaxseed and its combinations with each carrier (3:1 ratio of flaxseed+carrier) used in the experimental diets were grinded by a roller mill and extruded (BASH-C, Bühler Switzerland Group), and all the diets were formulated with similar nutrients. Birds feed intake, egg production, and feed conversion ratio were measured during the experiment. At the end of trial, 2 eggs per replicate were randomly selected to determine egg quality, and fatty acid profile of egg yolk.

Results & Conclusion: Base on the results of current study, the feed intake of birds in diets containing corn-gluten meal (T8 and T9) was significantly higher compared to other treatments ($P<0.05$) for the first 4-weeks of the trial.For the second 4-weeks, the same result was observed for birds' egg production ($P<0.05$). Experimental groups had no significant effect on egg weight, egg mass, and feed conversion ratio, and also Haugh unitsthroughout the study period. Feeding extruded full-fat flaxseed (T2 to T9) in comparison with control treatment significantly increased the alpha-linolenic acid (C18:3 n-3) in egg yolk, and decreased total saturated fatty acids (SFA, $P<0.01$). It can be concluded that the dietary inclusion of 15% flaxseed in combination with corn-glutenmeal improves the egg production and fatty acid composition of laying hens.

Keywords: Laying hen, Full-fat flaxseed, Soybean meal, Sunflower meal, Corn-gluten meal, Egg production, Fatty acid composition

Evaluation of the immunogenicity of the designed construct with HA2 subunit and Mx bioadjuvant against avian H9N2 influenza virus

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Objective: With the spread of corona virus and the increasing importance of influenza and the existence of numerous antigenic changes of this virus, extensive efforts are being made to produce a global vaccine against this disease. Due to the lack of antigenic changes in HA2 and due to the side effects of synthetic adjuvants, we designed Mx as a bioadjuvant and the HA2/Mxconstructas a vaccine candidate against this virus. Based on the results of the evaluation of the humoral immunity of this structure in the previous study and considering the importance of cellular immunity in influenza, the purpose of this study is to evaluate the cellular immunity of the designed structure.

Materials & Methods: The cellular immunity of HA2/Mxconstructusing the in vivo method of measuring lymphocyte proliferationwas evaluated. Immunization of mice using DNA/prime-DNA/boost strategy in several groups (include HA2 in primary injection and two boosters, HA2 and Mx in primary injection and one booster, HA2 and Mx in primary and two boosters) were performed. 60 days after injection of HA2 DNA construct, MTT method was used to evaluate cellular immunity in mice. In this way, lymphocyte proliferation was evaluated and stimulation index (SI) was calculated. To investigate the effects of possible tissue damage, in addition to the daily inspection of mice in terms of local reactions at the injection site, general reaction and weight loss, tissue sections from spleen and lung were histopathologically evaluated.

Results & Conclusion: The results show that cell immunity in the test groups is significantly higher than the control group ($p < 0.01$). The highest lymphocyte proliferation was in the group that was injected with HA2 and Mx structure with two boosts (average index 6.768). Also, no local reactions at the site or general reactions and death were observed. The average weight of mice in the control and treatment groups did not differ and increased from 20 grams to 32.8 grams during the study period. In the histological examination, no unwanted inflammatory reaction, hyperemia or cell deformation was observed in the lung and spleen. According to the result of cellular immunity and the appropriate increase in humoral immunity obtained in the previous study, as well as the absence of side effects from the studied antigen and adjuvant, this structure can be introduced as a suitable candidate for making a DNA vaccine against influenza.

Keywords: Influenza, Vaccine. HA2, Mx, MTT

Supplementation of protease to diets containing raw full fat soybean or soybean meal improves broilers growthperformance and nutrient digestibility

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Objectives: Among different feed ingredients in poultry nutrition,soybean is an excellent protein source; however, it contains some antinutritional factors, which decrease its nutritional value, and also bird performance.Supplementing broilers diets with an exogenous protease can be a strategy to reduce the negative effects of soy antinutritional factors and improve nutrientdigestibility. The aim of this research was to evaluate the effect of protease supplementation to diets containing raw full fat soybean, extruded at different temperatures on broiler performance and nutrient digestibility.

Materials &Methods:1440 one-day-old broiler chicks (Ross-308, male)were allocatedto 48 experimental units, including 8 treatments with 6 replicates of 30 birds each. Dietary treatments consisted of four different soybean sources;soybean meal (SBM), raw full-fat soybean (RFFS, 15% of diet), full-fat soybean extruded at 90 and 150 °C (FFSB90 and FFSB150, 15% of diet), with or without protease enzyme supplement (ProAct®, 0 and 0.02% of diet).Birds fed from 1 to 42 days of ageaccording to a 4×2 factorial arrangements.Three birds from each pen were selected and transferred to digestibility pens and continued on the same grower diet containing 0.3% chromic oxide. on d 23, after 5 d on assay diets, all birds were euthanized using CO_2 asphyxiation and immediately dissected. ileal digesta were collected from two-thirds of the distal ileum and transferred to the lab. The feed and digesta samples were dried and analyzed for dry matter, crude protein, ether extract, gross energy.

Results & Conclusion: The Feed consumption of experimental groups containing RFFS compared to other soybean sources was significantly lower ($P<0.01$) throughout the experiment. Dietary enzyme supplementation improved ($P<0.01$) body weight gain by 3.40% and 2.43% during finisher and overall periods, respectively. In addition, the interaction effect between soybean source and protease enzyme was significant for FCR in the finisher and overall periods; so that the addition of protease to the RFFS or SBM diets reduced the negative effect of RFFS and SBM on FCR ($P<0.05$), but no effect was observed in the diet containing FFSB bydietary addition of protease. The supplementation of 0.02% exogenous protease to the experimental diets improved ($P<0.05$) FCR by 2.76%, throughout the trial. In general, diets in which RFFS were used showed lower nutrients digestibility than other soybean sources ($P<0.05$). Also, dietary inclusion of protease increased protein digestibility (1.72%) and apparent ileal digestible energy (1.85%) compared to diets without enzyme ($P<0.05$).

Keywords: Digestibility, Feed conversion, Protease, Soybean source, Broiler

Immune Responses of Arian Roosters Affected by Dietary Alkaline Hydrolyzed Feather

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Objectives:Research on natural antioxidants, particularly bioactive peptides obtained through protein hydrolysis, is profusely reported. Such peptides, encrypted in protein sequences, only demonstrate biological activities after their release from the native protein. Therefore, several proteins and proteolytic enzymes are investigated, aiming to obtain bioactive peptides with potential utilization in food science, technology and nutrition.Recently, feather hydrolysates were reported to present antioxidant activities.The impact of antioxidant properties of dietary alkaline hydrolyzed feather meal(**AHFM**) on immune response of Arian roosters was investigated in present study.

Materials & Methods: In total, 20 Arian adult roosters at 32 weeks old with uniform body weight were randomly assigned to four treatments and five replications. The experimental groups include zero (control group), 2.5 g/kg, 5 g/kg, and 7.5 g/kg of **AHFM**. The duration of the experiment was 12 weeks.In this research, in the eighth and ninth weeks of the experiment, 1 ml of a 5% of washed sheep red blood cells(**SRBC**) was injected into the breast muscle of the roosters. In the tenth week of the experiment, blood was taken from the roosters. The total, 2-mercaptoethanol (**2ME**)-resistant and **2ME**-sensitive anti-**SRBC** titers were determined by microtiter hemagglutination test.Using the injection and inoculation of phytohemaglutinin(**PHA**) and dinitro-chlorobenzene(**DNCB**) to the right and left wattles of the rooster, respectively, and measuring skin thickness before and after 24 h the cell mediated immune responses were evaluated.

Results & Conclusion: Dietary supplementation of **AHFM** did not influence the total, and **2ME**-resistant anti_**SRBC** titers. However, a quadratic trend was observed in total and **2ME**-sensitive anti-**SRBC** titers so that the 2.5 and 5 g/kg **AHFM** decreased the titer and the 7.5 g/kg increased it ($P<0.05$). The skin response to **PHA** followed a quadratic trend by increasing the dietary **AHFM** levels ($P<0.01$). The skin response to **DNCB** followed a curvilinear trend by increasing the level of dietary **AHFM** ($P<0.01$). In conclusion there was no adverse effect of dietary supplementation of **AHFM** on humoral and cell mediated tested responsein Arian roosters.

Keywords: Alkaline Hydrolyzed Feather, Antioxidants, Arian Rooster,Immune response

Cryptosporidium Infection in Rock Domestic Pigeons (*Columba liviadomestica*) in East-Azerbayjan Province, Northwest Iran

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Objective: Cryptosporidiosis is considered a protozoan parasitic disease in humans, various birds, and animal species. Regarding the available information, among the 31 species of *Cryptosporidium* can infect a large number of vertebrates, some of them were determined can infect birds that have been reported in approximately 30 avian species worldwide. Although birds usually get infected with host-adapted *Cryptosporidium* species, there are growing evidence suggesting birds as mechanical transporters of zoonotic species.

Materials and methods: The present study aimed to evaluate the prevalence of *Cryptosporidium* spp. in rock domestic pigeons for the first time in Tabriz, East-Azerbaijan Province, Iran. For this purpose, one-hundred privately-owned pigeons with general clinical symptoms were included. Modified Ziehl–Neelsen-stained fecal smears associated with tissue samples were examined microscopically.

Results and conclusion: Oocysts of *Cryptosporidium* were observed in the feces of 53% of examined pigeons. Most of the positive birds had respiratory (nasal or ocular discharge) and or intestinal (diarrhea and enteritis) symptoms clinically and histopathologically. Of note, the data reported herein records the highest prevalence of pigeons' cryptosporidiosis ever reported form Iran and other countries. It is the first report of *Cryptosporidium* infection in pigeons in northeast Iran. Notably, the present findings invite further studies in more homing and domestic pigeons as well as their owners, handlers, and environment to demonstrate the public health implications.

Keywords:*Cryptosporidium* infection, oocyte, pigeon, zoonotic aspects, Tabriz, Iran.

Seroprevalence of *Toxoplasma gondii*and*Nesoporacaninum*indomestic pigeons (*Columba liviadomestica*) in East-Azerbayjan Province, Iran

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Objective:*Toxoplasma gondii (T. gondii)* and*Nesoporacaninum (N .caninum)* are considered as obligate intracellular tissue cyst-forming coccidian parasites of the phylum Apicomplexa infects domestic and wild mammals and birds. Birds belonging to the genus *Columba*such as domestic pigeons (*Columba liviadomestica*) may pose public health concerns since they can potentially disseminate zoonotic pathogens and serve as reservoir of several parasites. Of note, pigeons' closed-relationship with humans, animals, and other birds makes them a potential carrier and reservoir of some zoonotic infections. The present study aimed to evaluate the seroprevalence of *T. gondii*and *N .caninum*in rock domestic pigeons using serological tests.

Materials and methods: For this purpose, the blood samples were taken from 100 domestic pigeons (rock pigeon, *Columba liviadomestica*). The sera were separated for serology, which were conducted using modified agglutination test (MAT) and Neospora agglutination test (NAT) for detection of *T. gondii*and *N.caninum*antbodies, respectively. The sera were diluted two-fold up to 128, starting at 1:2 for both *N. caninum and T. gondii* and a titer of 1:2 and higher was separately considered as infection in pigeons.

Results and conclusion: The present results of MAT and NAT showed 45% and 35% seropositive for *T. gondii*and *N .caninum*antibodies, respectively. In addition, differences in *T. gondii*and *N .caninum*serology data was not (independently) significant statistically between adult and juvenile groups. Growing evidence demonstrated seropositive results of *T. gondii*and *N .caninum*in pigeons by various serological assays worldwide. Taken to gather, regarding closed relationship of domestic pigeons with humans and other animals, it was concluded that occurrence of tissue-cyst forming protozoa, particularly toxoplasmosis, are notable in East-Azerbayjan Province, Northwest Iran.

Keywords: parasites, agglutination test, serology, public health, Iran.

Effect of Different Doncentrations of FeO and ZnO Nanoparticles Coated by Methionine in Laying Quail Diet on Egg Production and Some Blood Parameters

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Objectives: Evaluate the different concentration of Iron oxide (FeO) and Zinc oxide (ZnO) nanoparticles coated with methionine in laying quail diet on egg production and blood parameters.

Methods: The effect of different concentrations of FeO nanoparticles (0, 0.6, 6 and 60 mg/kg) and CuO nanoparticles (0, 10 and 20 mg/kg) coated with methionine on egg production and blood parameters of laying Japanese quail evaluated in entirely randomized factorial designs. Iron and Zinc supplements were not considered in the initial diet.

Results: Different concentrations of FeO and ZnO nanoparticles coated with methionine significantly affected egg production and blood Albumin, Zn, Fe, uric acid, ALT, and LDH level ($P<0.05$).The highest effect was observed in a diet containing 0.6 mg/kg FeO nanoparticles and 20 mg/kg ZnO nanoparticles (except ALT and uric acid).Experimental treatments had no effect on quail egg weight. An interaction effect was observed in blood Zn level ($P<0.01$).

Conclusion: It seems that, in the case of using FeO and ZnO nanoparticles coated with methionine in a laying quail diet, the concentrations of 0.6 mg/kg of FeO and 20 mg/kg ZnO nanoparticles were sufficient to meet the iron and zinc requirement.

Keywords: Fe nanoparticle, Zn nanoparticle, Laying quail, Egg production, Blood parameters

An overview of the effects of heat stress on the safety and on a number of eggs quality indices in commercial Laying hens.

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Objective:Heat stress, as one of the most common stresses in laying hen farms, causes a decrease in the amount of production and a decrease in the quality indicators of the produced eggs. Based on the studies, this problem is caused by the negative effect on the amount of feed consumption, as well as by reducing the expression of the solute carrier proteins genes required for the formation of egg shells, and finally, reducing the weight and reducing the quality of the egg shells. It has been shown that heat stress causes the release of Catecholamines and Corticosteroids, which cause the peroxidation of cell membrane lipids of T-lymphocytes and ultimately lead to the suppression and reduction of the immune.

Materials & Methods: The effects of heat stress on the production of commercial laying hens are evident and production reduction is common in all flocks under heat stress. The physiological reasons for the decrease in production due to heat stress were studied in detail, and also by researching and asking poultry farmers, veterinarians, and poultry nutrition experts about the decrease in production of laying hen farms in the summer season and hot days of the year, the obtained information was collected and analyzed. The decrease in production due to heat stress was visible in most breeds and strains.

Results & Conclusion: The high temperature of the poultry breeding hall is one of the important factors of creating tension in the shed, which has negative effects on the production and performance of the poultry. Examining the obtained results shows that the stress of grappling causes a clear decrease in the thickness of the egg shell, which increases as the stress period increases. The results show that the level of solutes in the shell has decreased, that the decrease in the percentage of shell ash is a proof of this claim, that this causes a decrease in the thickness and weight of the shell, which is another reason for the decrease in egg weight, which is a decrease in the average diameter Eggs are another proof of this claim. The effects of heat stress, especially the negative effects on the immunity level of herds, have caused the use of probiotics and commercial vitamin and mineral supplements and other feed additives to reduce these harmful effects, which should be researched and investigated. be placed In general, it can be claimed that controlling the temperature of the rearing hall has a favorable effect on the quality and quantity of meat and egg production, and most importantly, it.

Keywords: Egg quality,Heat stress, Immune,Laying hen , Safety.

Identification and isolation of *Pasteurella*causesfowl cholera from industrial chickens in poultry farms in Abhar city

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Objectives:*Pasteurella*spp. Are Gram-negative coccobacilli, nonmotile and non- spore forming. Fowl cholera is a primary avian pasteurellosis caused by *P.multocida*capsular types A and F. It is highly contagiousand affects both domestic and wild birds.The diseaseusually presents as an acute septicaemia which is often fatal and causing significant economic losses in the poultry industry. Identifying and isolating *Pasteurella* from poultry farms and prescribing appropriate antibiotics can be very effective in preventing this disease.The aim of this studywas to identify and isolate *Pasteurella*from poultry by phenotypic method from poultry farms in Abhar city to prevent the spread of fowl cholera disease in this city.

Materials & Methods: In this work, samples were taken from the liver, intestines, joint fluid, and ovarian follicles of mother industrial chickens. Primary culture was done on peptone water medium to increase the number of bacteria for 6 hours and quadrant streakculture was done on blood agar and MacConkey and incubation at 37˚c for 24 hours.From pure colonies, Giemsa staining, microscopic examination, calatalase and oxidase tests, and penicillin sensitivity test were performed.Bacteriological tests include: cultivation in urea agar, SIM and TSI media.

Results & Conclusion: This bacterium lacked hemolysis on blood agar and had the ability to grow on MacConkey agar. Bipolar bacteria were observed in Giemsa staining and the results of biochemical and bacteriological tests were catalase positive, oxidase positive, urea negative, and sensitive to penicillin antibiotic.The result of cultivation on TSI as A/Aand without H_2S gas, on the SIM, nonmotile and positive indole were observed, which indicates the characteristics of *Pasteurella*.The results showed that *Pasteurella* was observed in some poultry farms in Abhar city, and we were able to identify and isolate the *Pasteurella* genus using routine bacteriological tests in the laboratory.**Keywords:***Pasteurella*, Fowl cholera, industrial chickens

Dietary periodical supplementation of hydrolyzed cottonseed protein on growth performance, humoral immune response and total antioxidant activity of serum in broiler chickens

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Objectives: This study was conducted to evaluate the effect of periodical supplementation of hydrolyzed cottonseed protein (HCP) in comparison with an antibiotic growth promoter (AGP) and the excessive level of vitamin E on growth performance, immune responses, digestive tract morphology and total antioxidant capacity (TAC) of serum in broiler chickens.

Materials & Methods: A total of 240 male broilers were randomly allocated to 6 treatment groups, with 5 replicates of 8 broilers each. The dietary treatments were as follows: basal diet (control), basal diet + 2 mg/kg lincomycin, basal diet supplemented with 50 IU vitamin E, basal diet containing 6 g HCP/kg of diet in starter phase, basal diet containing 6 g HCP/kg in starter and grower phases and basal diet containing with 6 g HCP/kg of diet in the whole experiment.

Results & Conclusion: Results revealed that the broilers supplemented with HCP in starter and grower phases had the highest final body weight ($P < 0.05$). Broilers fed diets containing HCP in the starter period and in the whole trial had significantly better FCR values during the finisher phase ($P < 0.05$). Jejunal villus height was significantly higher in broilers fed diets containing antibiotic ($P < 0.05$), although it tended to be higher in broilers fed diets containing HCP in the starter period. The jejunal villus to crypt ratio was markedly ($P < 0.05$) greater in broilers supplemented with antibiotic in comparison with other groups. Antibody titers against Newcastle disease vaccine **(**NDV**)** tended to be increased in broilers supplemented with HCP in the whole experiment ($P > 0.05$). Antibody titers against sheep red blood cell (SRBC) was significantly greater in broilers fed diets containing HCP during starter and grower, and in the whole experiment ($P <0.05$). The highest TAC was obtained in broilers fed diets containing excessive level of vit E also it tended to enhance in broiler fed the diet containing HCP during the experiment.

In conclusion, the findings in the current experiment reveald that supplementation of HCP in broiler diets during the experiment could improve FCR, antibody titers against SRBC and NDV and TAC of serum and it could be used in broiler diets as a suitable substitute to AGPs.

Keywords*:* Antibiotic; bioactive peptides; broiler; immunity; lincomycin; vitamin E.

Angara disease in first week broiler: a case report

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Objectives: Hepatitis-hydropericardium syndrome (HHS) or Angara disease is a highly infectious disease caused by Fowl adenovirus serotype 4 (FADV-4). It affects mainly 3- to 6-week-old broiler and rarely occurs in breeder and layer flocks. FADV-4 can not only be transmitted from one flock to another through the oral-fecal rout, but also the progeny of an infected flock may receive the virus through vertical transmission. Its clinical symptoms include lethargy, loss of appetite, anemia and high mortality, so that the mortality rate can increase up to 80%. Vaccination of the breeder flock and compliance with biosecurity proceduresare effective methods of prevention.These measures intercept the entry and transmission of pathogens in the farms. In this study, the involvement of a broiler flock in the first days of breeding with HHS is reported.

Materials &Methods: In the discussed farm with a capacity of 20,000 chickens in two houses, 50, 100 and 400 mortalities were recorded from the 3rd to the 5th day respectively. This disease was diagnosed after taking history, clinical signs observation, postmortem examination and taking samples from dead chickens.Then, the samples were referred to the laboratory for further investigation and molecular PCR test.The tests were performed as an indicator to prove the presence of the pathogenic virus.

Result &Conclusion: The farm was visited on the sixth day of the breeding period.Necropsy findings include obvious hydro-pericarditis, deformation and rounding of the heart's apex, liver congestion and necrosis around the lobes, and liver fragility. The presence of the virus was confirmed by PCR and the flock was culled on the 8th day. Considering that the disease mainly occurs at the age of 3 to 5 weeks and the flock in question suffered losses due to HHS at the age of 3 days, it shows the great importance of breeder flock management, correct and timely vaccination, determining the health status of chickens due to the possibility of vertical transmission of this disease.

Keywords: Hepatitis-hydropericardium syndrome, Angara Disease, Broiler, FADV-4

Outbreak of histomoniasis in a commercial turkey flock: a case report

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Objectives: Histomoniasis is a parasitic disease that, despite its pathogenic potential and high virulence in turkey flocks, occurs less frequently in forms of commercial turkey production that routinely use antimicrobial drugs and fresh litter. The causative agent of the disease in turkeys is the protozoan *Histomonasmeleagridis*, which can enter the bird's body by ingesting the eggs or larvae of the nematode *Heterakisgallinarum*, which is the vector of this parasite, or through the cloacaroute (cloacal drinking). Then, by causing damage in the cecum, it enters the mucus and blood then reaches the liver. Damage to the cecum and liver causes symptoms such as reduced feed consumption, drowsiness, head down close to the body or tucked under a wing and anorexia, foamy yellowish sulfur diarrhea.In this study, the outbreak of histomoniasis with a high mortality rate in a commercial turkey flock is reported.

Materials &Methods: Clinical observation, necropsy of the affected birds, parasitological examination with giemsa staining direct observation and PCR test were performed to assess the outbreak of histomoniasis.

Result &Conclusion: A commercial turkey flock with capacity of 1000 birds was investigated with symptoms of severe diarrhea and lethargy. The mortality rate from the beginning of clinical signs were equal to 60%. In the post-mortem examination, necrotic lesions of the liver and cecum, as well as the presence of cecal core in the contents of the cecum, were observed. Liver and ceca samples were taken and the involvement of*Histomonasmeleagridis*was confirmed using PCR, histopathology techniques and Giemsa staining.Although there are limited histomoniasisreports in Iran, the importance of this disease will be increasing.Studies show that turkey meat consumption as a source of protein has increased in recent years, and therefore the need to increase the capacity of turkey breeding is felt. In this situation, histomoniasis can be considered as a serious risk for this growing industry, even for breeding systems in which antimicrobial compounds are widely used.

Keywords: Histomoniasis, *Histomonasmeleagridis*, Commercial Turkey Flock, PCR, Necropsy

Investigating the level of Cryptosporidium parasite infection in Tabriz pigeons in 2021-2022

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Objective

Cryptosporidium parasite is one of the important parasitic and zoonotic protozoa and causes diarrhea in humans and animals. Due to the health importance and economic losses caused by cryptosporidium, this study was conducted with the aim of determining the amount of cryptosporidial contamination in pigeons of Tabriz city between 2021 and 2022.

Materials & Methods

For this purpose, 500 stool samples from 500 pigeons were tested. After concentrating the samples, the extensions were prepared by formalin-ether sedimentation method and stained by the modified Ziel-Nelson method and studied with a light microscope.

Results & Conclusion

Cryptosporidium cysts were observed in 13 samples (2.5%). from positive samples, 5 were male and 8 were female, and there was no statistically significant difference in the frequency of infection in the two sexes (P>0.05). The frequency of infection in the two diarrheal and non-diarrheal groups was 7 cases (5.7%) and 6 cases (1.6%), respectively, and these two groups had a statistically significant difference in terms of the infection rate (P<0.05).The results of this study confirm the presence of Cryptosporidium infection in apparently healthy pigeons with diarrhea in Tabriz city. Therefore, pigeons can be one of the sources of cryptosporidium contamination for other birds and possibly humans.

Key Words: cryptosporidium, Pigeon, Tabriz

Comparative Histopathological Study of Acute Mark's Disease in a Breeder Stock

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Objectives: Mark's disease is one of the most common lymphoproliferative diseases of poultry which is caused by a herpesvirus.In this disease, almost all organs of the body, including the liver, spleen, heart, lungs, skin, peripheral nerves and reproductive glands are affected.The purpose of this study was to determine the severity of this disease and to compare the pathological effects caused by it in different organs.

Materials & Methods: In order to carry out this study, 5 chickens with Mark's disease were selected from an infected poultry farm. In the affected herd, symptoms such as excessive thinness, ruffled feathers and their contamination with feces, paleness of the crown and beard, decreased transparency of the eyes, ataxia, paralysis of legs and wings were seen. Also, symptoms such as weakness, anorexia, reluctance to drink water and eat food and diarrhea were recorded in their history. In addition, the macroscopic observations showed enlargement of the liver, spleen, heart and kidney, and nodular foci were also seen in the intestines. After selecting the subjects, 1 cm thick samples were taken from their visceral organs including liver, kidney, spleen and heart. The samples taken for histopathological examination of the tissues were stained with the usual method of Hematoxylin and Eosin and studied microscopically.

Results & Conclusion: In the macroscopic examination of different tissues, the presence of small and large nodules, gray and transparent in color, was observed.Changes such as the presence of small and medium lymphocytes, and lymphoblasts and active reticulum cells in different tissues were seen in the microscopic observations.The intensity of these changes was higher in the liver, spleen, kidney and heart tissues, respectively.From the results of this study, it can be concluded that the composition of tumor cells in different organs appear similar, but the intensity of these changes is significantly higher in liver tissue than in other organs.

Keywords:Mark's disease, Lymphocyte, Hepatic Tissue, Spleen, Breeder Stock

Molecular Identification of*Cryptosporidiumparvum*and *Cryptosporidiummeleagridis*in Domestic Pigeons (*Columba liviadomestica*) Iran

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Objective:*Cryptosporidium* is a major protozoan parasite of birds and a primary pathogen in poultry, causing respiratory and/or intestinal disease, leading to morbidity and mortality. Three avian *Cryptosporidium* species i.e. *C. baileyi*, *C. meleagridis* and *C. galli* have been more investigated.In Iran, knowledge about cryptosporidiosis in pigeons is limited to few studies in none of which *Cryptosporidium* speciation was performed.

Materials and methods: The present study aimed to evaluate the molecular identification of *Cryptosporidium* spp. in domestic pigeons for the first time in Iran. For this purpose, one-hundred privately-owned pigeons with general clinical symptoms were purchased. Genomic extracted DNA of fecal specimens were examined by nested-PCR assay, followed by Sanger sequencing and phylogenetic analyses.

Results and conclusion: Consensus sequences of detected parasites revealed infection of pigeons with *C. parvum*and *C. meleagridis*. It is the first molecular detection of *Cryptosporidium*species in pigeons in Iran. Considering that domestic pigeons are one of the most common birds worldwide and both *C. parvum*and *C. meleagridis*are being reported from human patients frequently increasing awareness about possible transmission of zoonotic *Cryptosporidium* species from pigeons and management of pigeons' excreta in public places are suggested.

Keywords:*Cryptosporidium* infection, PCR, pigeon, zoonotic aspects, sequencing, Iran.

Studies on Salmonella infections in poultry farms around Mashhad city: determiation of serogroups and drug resistance pattern of the Salmonella isolates

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Objectives: Zoonotic diseases of food origin such as salmonellosis are among the maineconomical and health issues in industrialized and non-industrializedcountries. Poultry can play an important role in epidemiology anddistribution of salmonellosis in humans. The aims of this study were toisolate Salmonella from poultry farms around Mashhad city, identify theserogroups and determine the drug resistance pattern of the isolated Salmonella.

Materials & Methods: A total number of 1560 samples were collected from freshly dropped feces of broiler chickens in 23 flocks. Each 10 samples were pooled and processed for Salmonella isolation according to standard procedures. Slide agglutination test was used for determination of O serogroups using polyvalent antisera of A to D. Antimicrobial susceptibility of the isolates against 27 agents was determined using standard disk diffusion method. Out of 1560 samples (156 pooled-samples), 30 Salmonella isolates were recovered.

Results & Conclusions The results of serological tests identified six serogroup D, one serogroup other than A-D and the rest of 23 isolates as serogroup C. All 30 Salmonella isolates were susceptible to fosfomycine, ceftriaxon, cefixime, norfloxacin and gentamycin but were resistant to colistin and amoxi-clav. Multi-resistance was common among the Salmonella isolates. Resistance to at least 2 and at most 18 antimicrobial agents was shown and 23 drug resistance patterns were found. The results of this study showed the presence of Salmonella infection among broiler chickens in Mashhad region and the occurrence of antimicrobial resistance among the isolates. These findings are important for Iranian poultry industry and of concern for public health.

Key Words : Salmonella, serogroup, broiler chicks, Mashhad, drug resistance

Parrot Beak and Feather disease prevalence in Tabriz Parrots from 2021 to 2022 by PCR

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Objective

Psittacine beak and feather disease (PBFD) is also known as psittacine circovirus (PCV) or Psittacine Circoviral Disease (PCD). It is the most common and highly infectious viral disease among parrots. The disease appears to have originated in Australia.Psittacine beak and feather disease can cause very high death rates in nestlings both in captivity and the wild. It can cause long-term immunological suppression, as well as cause feather and beak abnormalities. Prevention is the best method of control as there is no effective treatment for psittacine beak and feather disease. The aim of this study was Parrot Beak and Feather Disease prevalence in Tabriz parrots from 2021 to 2022 by PCR method.

Materials & Methods

For this purpose, 100 samples of different species of parrots from Tabriz city with clinical symptoms of severe feather loosing were selected.Body feathers and a drop of blood were used for sampling. The samples taken were tested by PCR on the same day.The investigated birds included 31 cockatiels, 12 African greys, 2 cockatoos, 40 love birds, and 17 budgerigar.

Results & Conclusion

64 samples of birds in PCR analyses were positive (64%). 28 cockatiels (90%), 3 African greys (25%), 1cockatoos (50%), 20 love birds (50%), and 12budgerigar (71%) were positive by PCR analyses.Prevention is the best method of control as there is no effective treatment for psittacine beak and feather disease. It is extremely difficult, if not impossible, to remove the virus once it has been introduced into a captive or wild population.

Key Words: PBFD, Circovirus, Parrots, Tabriz

Molecular investigation of Psittacine beak and feather disease in south of Iran

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Psittacine beak and feather disease (PBFD) has been detected in both wild and captive parrot populations since the mid-1970s. The disease has been found to be widely infectious and often fatal, affecting both Old and New World psittacine species. It has been a major threat to wild parrot populations and has become a major cause for concern to conservationists and aviculturists as the disease has spread rapidly across the world due to BFDV's high environmental persistence and ability to shift between closely related host species. From early in April 2021 until last in september2022, 274birds from different parrot species with or without clinical manifestation of the feather or beak abnormalities were sampled,randomly. by molecular investigation of 717bp of *Rep* gen, the virus was detected in 174 cases (63.5%) which implies high prevalence and emergingconcernsfor the disease in captive psittacine population in south of Iran. Interestingly clinical signs varied from feather abnormalities to retarded growth to relatively normal appearance. Relative mean age affected was between 6month to 1year and as they were maintained in sporadic cages from fledgling suggesting long incubation periods and possibly vertical transmission of the disease. No mortality rate was detected as a result of conservative treatments or maybe because of new virus variants. Cockateil was the most affected species in this survey maybe because this species is the most common companion birds in Iran.Assessing the prevalence and impact of disease can be very useful especiallyfor improving of our understanding from virus origin, virulence, spread and evolution. Increased emphasis should be placed on the screening of captive and wild parrot populations within country

Keywords: Parrot, Beak and feather disease,cockateil, south of Iran

Investigating the level of Escherichia coli infection in psittacine and evaluating its drug resistance using antibiogram disks

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Objectives: The aim of this study is to investigate the prevalence of Enterobacteriaceae, especially Escherichia coli, in psittacines. The presence of Enterobacteriaceae in psittacine is unusual, and as one of the common organisms between humans and birds, it may endanger the lives of psittacines.

Materials & Methods: Psittaciformes are one of the endangered groups of birds, and among them, several Brazilian parrot species are classified as endangered. Therefore, it is necessary to identify the factors that cause infection in captive wild animals in cages and to evaluate the risks caused by it and to minimize the possibility of disease outbreak, which leads to the protection of endangered species. For sampling of live birds, samples were taken from fecal samples and cloacal swabs, and in dead birds, after necropsy, samples were taken from the contents of intestines and liver. The samples were isolated from species such as Budgerigar, cockatiel, Cacatua, Red-tailed amazon and Gray parrot. In these birds, the presence of eae, stx1 and stx2 genes (Shiga toxin genes) has been determined using PCR method. The findings show that some E. coli isolated from psittacine birds show the same virulence factors with avian pathogenic E. coli (APEC), uropathogenic E. coli (UPEC) and enteropathogenic E. coli (EPEC) pathotypes. Strains of E. coli that are stx2+ and eae+ are commonly associated with severe human diseases such as hemorrhagic colitis and hemolytic-uremic syndrome. The positive results indicate a common risk between humans and birds in rearing psittacidae in domestic environments. Also, the percentage of antibiotic resistance of Escherichia coli isolates is stated as follows: amoxicillin (70.93% of the isolates were resistant), ampicillin (75.58%), ciprofloxacin (23.25%), chloramphenicol (14.1%). 33%), doxycycline (6.6%), enrofloxacin (41.28%), tetracycline (69.19%), sulfonamide (71.51%), sulfamethoxazole/trimethoprim (46%), streptomycin (34%) and kanamycin (25%).Multiple resistance between three to four antibiotic groups has also been observed. These results suggest that illegally traded birds carry potentially pathogenic bacteria, including strains of E. coli with antimicrobial resistance.

Results & Conclusion: Considering the increasing demand for keeping parrots as pet birds for children and teenagers, more care is necessary to reduce the risk of zoonoticdiseases between humans and birds.

Key words: Escherichia coli, Psittacine, Antibiogram, Zoonoticdiseases

Effects of dietary inclusion of darkling beetle larva on immune responses of broiler chickens

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Objectives: An experiment was conducted to evaluate the dietary inclusion of larva powder of darkling beetle (*Tenebrio molitor*) on immune responses of broiler chickens.

Materials & Methods:A total of 700 day-old Ross 308 boiler chickens were attributed in a completely randomized design with seven treatments and five replicates of 20 birds each. Experimental treatments were included 1) diet without insect powder or corn gluten meal (control), 2 to 4) diets contained 1, 2 and 3% larva powder of darkling beetle, 5 to 7) diets contained 1, 2 and 3% corn gluten meal. Birds received the mentioned dietary treatments from 1 to 24 days of age. On day 14, phytomagglutinin phosphate (PHA-P) was injected into two birds per replicate and cellular immunity (cutaneous hypersensitivity reaction(CBH)) was quantitatively evaluated.On days 10 and 17, 5% SRBC suspension was injected into three chickens from each pen to evaluate the humoral immune responses. Seven days after of the second injection, the blood serum samples were collected and the hemagglutination reaction method was used to evaluate the antibody titers.

Results & Conclusion: Total antibody and IgY titers (in response to SRBC injection) were significantly increased in birds received larva powder of darkling beetle($P<0.05$). Orthogonal contrasts results showed cellular immunity (cutaneous hypersensitivity reaction, 24 hours after DNCB injection), in birds fed with larva powder of darkling beetle was significantly stronger, also total antibody and IgY titers were higher than those received corn gluten meal ($P<0.05$). Dietary inclusion of larva powder of darkling beetle up to level of 3% in the starter and grower diet (days 1 to 24) can improve the immunity of broiler chickens.

Keywords: larva of darkling beetle, cellular immunity, humoral immunity, broiler chicken, corn gluten meal.

The Anatomical and Radiological Study of Wing Bones in Turkey (White Hybrid Optima)

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Objectives: Turkey (Meleagris gallopavo) has an important role in our life and it has become a bird of global economic importance, it has received little attention from anatomists. It is also important to practitioners because of economic reasons since skeletal disorders can cause financial loss to the poultry and turkey industry. This study aimed to provide a comprehensive description of the domestic turkey's radiographic anatomy of the appendicular structure. This study may assist clinicians in radiographic assessment in clinical practice.

Materials and Method: In this study, six 4-month turkeys (3 males and 3 females) were transported to the veterinary hospital and the wing was radiographically examined (tube Toshiba) in the desired directions.Turkeys were anesthetized with ketamine (10mg/kg IM) and xylazine (1mg/kg IM) and they were examined radiographically in mediolateral and caudocranial positions. Some elements of the humerus, radius, ulna and metacarpal bones were identified. Then, the length of the humerus, radius, and ulna was measured. After radiographic examinations, turkeys were slaughtered and then transferred to the dissection room to prepare the bones. Bones were prepared by the maceration method. Next, soak the bones in 99% hydrogen peroxide for 24 hours to whiten the bones. Radiographic measurements and anatomical morphometry were performed by X-tream DR software and Digital caliper respectively.

Result and conclusion: The length of the measured bones in the mediolateral position was closer to anatomical measurement than in the caudocranial position. The length of females' bones was shorter than males' bones. Turkeys' humerus was taller than ducks' (Anas platyrhynchos domesticus), brown wood owls (Strixleptogrammica), and crested serpent eagle (Spilornischeela).

Keywords: Anatomy,Radiography,Poultry, Turkeys, Wing, Meleagris gallopavo

The role of trace mineral supplements on the performance of broiler chickens

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Objectives: Trace mineralssuch as Copper (Cu), Manganese (Mn) and Zinc (Zn), are particularly essential for maintaining broiler health and productivity as they affect multiple physiological processes. Common sources of these elements in poultry diets include inorganic (oxide or sulfates), organic and hydroxychloride, all of which have different bioavailabilities. Due to their crystal structure,preparing a source of hydroxychloride form of these elements, probably does not have the limitations of inorganic sources and causes slow release during digestion, optimal absorption and, as a result, less excretion. The aim of this study was to evaluate the effects of hydroxychloride form of Cu, Fe, Mn and Zn supplementation in broilers.

MaterialsandMethods: Four groups ofday-old broiler chickens were fed using different diets. The first (control) group was deficient in Cu, Mn and Zn. Other groups included the control diet plus copper hydroxychloride (50, 200**ppm**) or manganese hydroxychloride (50, 200 **ppm**) or zinc hydroxychloride (50, 200 **ppm**) supplements respectively, each group had 6 replicates with 10 birds.

Results and Conclusion: The evaluations showed thatthe difference of live weight of chickenson the 20th, 30th and 40th days of agebetween four groups was statistically significant ($p<0.05$).Feed conversion ratio (FCR) at the age of 42 days for all groups fed with supplements was significantly higher than the control group, which was more evident in Cu and Zn groups. The interesting finding was about manganese: the positive effect of Mn on breast yield at the concentration of 50 ppm of Manganese hydroxychloride compared to 200 ppm was prominent, but the observations showed that the performance of the back and wings were higher at 200 ppm than other groups.For total footpad score (TFS), higher levels of Cu improved footpad scores and reduced foot pad lesions. As a result, it is clear that copper and zinc at a high level (200 ppm) and manganese at a low level (50 ppm) is a suitable source for supplementing the diet of broiler chickens to increase their productivity. Hydroxychloride form of minerals could be used as a suitable alternative for sulfate source without compromising the quality of broiler chicken due to its absorption and bioavailability.

Keywords: Broiler Chicken, Feed Conversion Ratio, Food Pad Lesions, Supplement, Trace Minerals

Assessment of pathogenicity and tissue tropism of three H9N2 avian influenza virus isolates after experimental infection in Specific-Pathogen-Free chickens

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Avian influenza(AI)virus subtype H9N2 is one of the most important LPAI viruses in poultry around the world. An experiment was carried out for studying the pathogenicity of three H9N2 isolates. Eighty four one-day-old SPF chickens were divided randomly into four groups(21 chicks per group)in separate isolators with positive pressure. At the age of 30 days-old chickens in group 1,2, and 3 were inoculated with 106EID50 of three H9N2 isolates by oculo-nasal rout, group-4 was kept as the control group and inoculated with distilled water. Samples from oropharyngeal and cloaca swabs and various tissues were collected at 2, 4, 6, 8, 10 and12 days post-inoculation(PI). The Real-time PCR assay was used for detection of the virus in tracheal and cloaca swabs and tissue samples. In treatment groups, H9N2 AIV was detected from all examined tissues except liver and thymus at 2, 4 and 6 dpi. Maximum histopathological lesions were seen from 2 dpi till 8 dpi in trachea, lung, liver, kidney, spleen, cecal tonsil and thymus eventually. Lesions in other tissues including cecal tonsils, and cloaca was not significant. In immunohistochemical studies of the collected tissues, the presence of antigen in the epithelial cells of lung, kidney and intestinal tissues, mainly was observed on days 4 and 6 post inoculation. Considering the fact that H9N2 viruses are of low pathogenicity they show various pictures in field. According to the results there was some pathogenic differences between three isolates but not significant.

Keywords: Avian influenza virus, H9N2 subtype, SPF chicken, histopathology, immunohistochemistry, Real time RT-PCR.

Use of autoclave to reduce bacterial and fungi agent in Sterilizing syringe andvaccination tools

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Objectives: this study was taken to evaluate the efficacy of autoclave for disinfection and inactivation of bacterial agentsinvaccination tools.

Materials & Methods: The sample was taken fromsyringe surfaces and surface tools that stored in vaccine roomwith sterile swap before and after disinfection with continues steam concentration of autoclave at 121 above atmospheric pressure for 30 minutes

Results & Conclusion: The total count show us the significant decrease of 99.9% of bacterial level before and after using autoclave,also the E.coliwhich found before disinfection, completely eliminate afterautoclave.The result presented in this study suggested that significant reduction in both E.coli and other bacterial population can be achieved in vaccination by autoclave. the samples that taken before disinfection with autoclave was show the number of 48 fungi while the samples were taken after autoclave was not show any fungi.

Keywords: Autoclave , hatcherytfungi , disinfection, bacteria ,vaccination

Efficacy of fluralaner (Exzolt) for the treatmentof red mite and comparison with current methods in layer farms

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Objectives: Red mite is one of important parasite that cause commercial loses in layer flocks. In recent years, due to new animal protection laws and the use of open cages, these problems have become more serious in farms.
the present study evaluated the acaricidal action of anew formulation containing fluralaner (Exzolt) against red mite and compare it with curren methodsinlaying hens .

Materials & Methods: The fluralaner-treated group received Exzolt in drinking water at a dose of 0.05 mL/kg body weight (equivalent to 0.05 mg fluralaner/kg body weight), twice, 7 d apartin drinking water of 3 layer flocks of bovans breed at 61 weeks.It was effective in the treatment of the mite. The performance of exolt was compared with pervious protective compound against mite

Results &Conclusion: In this study, Exzolt showed acaricidal efficacy in the treatment and control of the mite and it effectively reduced mite-induced dermatitis.Egg breakage decreased from 1.3% to 0.9% after one month

Keywords: Laying hens.Exzolt.Red mite

The effect of probiotics and malt extract on blood parameters (total cholesterol, LDL, HDL and triglyceride) in broilers

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Objectives: The purpose of this experiment is to investigate the effect of probiotics and malt extract on blood factors (triglyceride, total cholesterol, LDL and HDL) in broiler chickens.

Materials & Methods: This experiment was conducted in the form of a random design in 250 chickens with 4 treatments and 5 repetitions and 10 Ross breed chickens in each repetition.Broilers wereclassified into 4 groups. The first group of broilers received no additives (control) and the second group received commercial probiotics (100 grams per ton). The third group was fed with commercial probiotic (50 g/ton) and malt extract (100 g/ton), and the fourth group received only malt extract (200 g/ton) for 45 days.

Results & Conclusion: The results of this experiment showed that chickens in the control group had significantly the highest serum levels of cholesterol and triglycerides. Addition of 200 grams of malt extract per ton of food ration caused a significant increase in the serum HDLlevel in broiler chickens compared to the control group. The three treatments containing additives had significantly lower LDL and VLDL levels than the control group. The lowest blood cholesterol level was observed in the group fed with a diet containing 200 grams of malt extract.

Since the greatest effect on cholesterol reduction was seen in treatment 4 (containing 200 grams of malt extract), it can be said that supplementing the diet of broiler chickens with malt extract and probiotic separately has a high effect on the significant reduction of blood serum lipids. Since the greatest effect on cholesterol reduction was seen in treatment 4 (containing 200 grams of malt extract), it can be said that supplementing the diet of broiler chickens with malt extract and probiotic separately has a high effect on the significant reduction of blood serum lipids in He had broilers. Among these, malt extract had the best effect in significantly reducing blood serum lipids and significantly increasing HDL.

Keywords:probiotics,malt extract, blood parameters, broilers

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Investigating the effects of using a mixture of mint and savory herbs on blood parameters and immunity of laying hens

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Objectives: The purpose of this study was to evaluate the effects of different mixtures of mint and savory herbs on biochemical parameters and blood immunity in laying hens.

Materials & Methods: Experiment in the form of a randomized design with 160 flocks of laying hens in 4 treatments including a control treatment in which no herbal medicine was used. Treatment 2 contains 1% mixture of medicinal plants (mint 50% and savory 50%), treatment 3 contains 2% of these herbs (mint 75% and savory 25%) and treatment 4 contains 2% (mint 25% and savory 75%). The experiment was conducted with 4 replications and 10 pieces of chicken in each replication for 12 weeks. Medicinal plants were prepared fresh.

Results & Conclusion: The results showed that the use of different mixtures of medicinal plants had significant effects on biochemical parameters and the percentage and ratio of immune cells in the blood of laying hens ($p<0.05$).The experimental groups showed a significant difference in serum triglyceride levels. The lowest amount of blood serum triglyceride was observed in treatment 2. However, no significant difference was observed between the experimental groups in the rest of the serum biochemical parameters. But numerically, the lowest levels of glucose and albumin were observed in treatment 2.The experimental groups had a significant difference in relation to the percentage of heterophile and the ratio of blood cells. So that the lowest percentage of heterophile (28.4) and the lowest ratio of heterophile to lymphocyte (0.38) were observed in the experimental group of treatment 2.It is concluded that the use of 2% of the mixture of two medicinal plants in treatment 2 improves the biochemical parameters and immunity level in laying hens.

Keywords:mint, savory, blood parameters, immunity, laying hens

Protective Effect of *Turmeric Powder* on Fabricius bursa Tissue of Iranian Turkeys Following Heat Stress

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Aim: The present study aims to evaluate the protective effects of turmeric powder on the damage caused by heat stress in the testicles of young turkeys.

Materials and Methods: Fifteen native bronze-race male turkeys with an age of 20-22 weeks were kept in experimental conditions for 20 days. The turkeys were fed based on the nutritional recommendation of NCR. The treatment group samples underwent heat stress of 32 to 35 C° for 5 hours daily for 2 weeks. The first group was the normal group kept under standard ambient temperature conditions. The second group was treated with 1% turmeric powder for two weeks under heat stress. The third group was the control group which was only under heat stress for 2 weeks. All blood samples were taken by hormone kits of Kavoshyar Company. The separated testicles were weighed by a digital scale. The tissue sections were stained with hematoxylin and eosin and examined under a light microscope. The data were expressed as Mean ± SE. ANOVA statistical analysis method in SPSS -13 Software was used to compare significant level differences between the groups. The $P<0.05$ value was considered to determine the significant level between the groups.

Results: Observing the group under heat stress revealed the emptying of lymph follicle cells and the dropping of epithelial tissue cells. Observing the group treated with turmeric powder under heat stress showed the presence of lymph follicles inside the Fabricius bursalining and semi-absolute epithelial tissue with the presence of goblet cells. Unlike the second group, no destructions of the epithelial tissue were seen. The results obtained from the immune titer of antibody against Newcastle virus (HI) on the first day showed no significant differences ($P>0.05$). However, a significant difference was found between the groups on the 14th and 28th days of the immune titer ($P<0.05$).

Discussion and Conclusion: Based on the obtained results, it can be stated that using turmeric powder has a significant effect in combating the toxic effects of heat stress. The effects of using this drug in preventing damage to the bursa of Fabricius lining tissue were evident in measuring the immune titer in the group treated with turmeric powder compared to the group under heat stress. Therefore, it is recommended to use turmeric powder in the diet of these animals when faced with heat stress damage.

Keywords: Fabricius bursa, Heat Stress, Iranian Turkeys, Turmeric Powder

Hydropericardium Hepatitis Syndrome (HHS: Angara disease) and Inclusion Body Hepatitis (IBH) in commercial pre-layer flock, Qom province, Iran: A Case report

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Abstract: The clinical diseases of Hydropericardium Hepatitis Syndrome (HHS: Angara disease) and Inclusion Body Hepatitis (IBH) were caused by fowl adenovirus. Although the broilers are more susceptible to the disease, but laying poultry has also been reported in Iran. This case is the first report of commercial layer flock in Qom province. The farmer's complaint was about increased casualties.The History and clinical signs and necropsy of the herd were investigated by a poultry disease specialist veterinarian. The origin of this pullet was out of the province and was non-vaccinated to the HHS and IBH. The farm capacity was 60,000 pieces. The morbidity was low almost 5% and mortality was 1.59% (957 pieces) within four weeks of illness. The onset of casualties was increasing from 10 pieces to 115 pieces and then the trend was decreasing. The clinical signs were only mild green diarrhea and flock appetite was down by 20%. The herd had not yet reached the production age but in general, the flock was lively. The gross lesions were characterized by pericardial effusion with a clear accumulation of straw-colored pericardial fluid and enlargement and discoloration of the liver with hemorrhagic or necrotic foci and presence of urate deposits in kidney tubules and ureters and necrotic foci in kidneys were observed in all 15 carcasses that were necropsied. Therefore heart, liver and kidney samples from fresh carcasses send to molecular and histopathological laboratory for HHS and IBH. Using specific primers for the conserved hexon gene of HHS and IBH, two specific band of ~600 bp were amplified for HHS and IBH by specific primer conventional PCR and Real time PCR. The results were positive for HHS and IBH based on conventional PCR and Real time PCR methods. Infiltrations of mononuclear cells in hepatic tissues, multifocal and centrilobular necrosis with diffuse degeneration and presence of intranuclear inclusion bodies (basophilic) in hepatocytes were observed in liverand so the histopathological results were also positive for Fowl adenoviral disease. Thus the farm was quarantined and during illness were supportively treatmented by vitamin E, selenium, mycotoxin binder, acetic acid and hepacarnitol. Finally, the disease was left behind after 4 weeks with relatively low casualties.

Key words: Hydropericardium Hepatitis Syndrome, Inclusion Body Hepatitis, Qom, Iran

Effect of Yarrow Extract on Blood Parameter and Intestinal Bacteria of Broilers

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Objective: The aim of this study was to investigate the effect of different concentrations of aqueous extract of yarrow (*Achilleawliihelmsii)* leaf and flowering heads on blood parameters and population of some ileal bacteria of broiler chickens.

Materials & methods: Using a completely randomized design a total of 260 Ross 308 day-old broiler chickens (male and female) were allocated to 5 experimental treatments (4 replicates, 13 birds each) and reared for 42 days. During the rearing period, each experimental group was fed with one of the following diets: a basal diet without additive (as the control control), basal diet added with antibiotic (50 g/ton, erythromycin), basal diet added with 25% yarrow extract, basal diet added with 50% yarrow extract and basal diet added with 100% yarrow extract. The chicks were fed with starter, grower and finisher diets from 1 to 10, 11 to 24 and 25 to 42 days of age, respectively. At the end of rearing period (42 d of age), 4 birds were chosen from each treatment, slaughtered and blood and ileal samples were taken to determine the concentration of blood metabolites (triglycerides, cholesterol, LDL and HDL) as well as population ofileal*Lactobacillus* and *E. coli* bacteria. In addition, carcass yield and relative weight (% of live body weight) of different carcass parts (wings, thighs, breast) were calculated.

Results and conclusion: The results indicated that dietary supplementation with antibiotic and different levels of yarrow extract had no significant effect on the concentration of blood metabolites (triglycerides, cholesterol, LDL and HDL) ($P>0.05$). Also, population of ileal*Lactobacillus* and *E. coli* was significantly not affected by experimental treatments ($P>0.05$). Carcass yield in chickens fed 25 and 50% extract significantly was higher than the control group, while relative weight of wings, thighs and breast was remained unaffected($P>0.05$). In conclusion, the findings indicated that under the condition of the current study,dietary inclusion of antibiotic and yarrow extract had no significant effect on ileal bacteria count and blood metabolites, whereas application of 25 and 50 % yarrow extract could improve carcass yield of broilers.

Keywords: *Achilleamillefolium*, blood parameters, broiler chicken, intestinal bacteria, yarrow

Evaluation of Growth Promoting Effect of Some Fruit Waste in Broiler Chickens

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Objective: This experiment was designed to investigate the possible growth-promoting activity of different fruit wastes (pomegranate peel powder, lemon pulp powder and apple pulp powder), as natural alternatives to chemical antibiotic, on the performance traits of broilers.

Materials & methods: A total number of 260 male and female 308 Ross broiler chicks were distributed in a completely randomized design among 5 experimental treatments with 4 replicates of 13 birds each. During the rearing period, the control group was received a basal diet without any additive, while other birds in groups 2 to 5 were fed same basal diet supplemented with antibiotic (50 g/t, Erythromycin), 2% pomegranate peel powder, 2% lemon pulp powder or 2% apple pulp powder. Isonitrogenous and isocaloric starter, grower and finisher diets were provided from 1 to 10, 11 to 24 and 25 to 42 d of age, respectively. Body weight and feed intake were measured at the end of the starter, grower and finisher phases of the experiment. Also, body weight gain (BWG) and feed conversion ratio (FCR) were calculated for each experimental period.

Results and conclusion: The results showed that performance parameters such as BWG and FCR were significantly influenced by experimental treatments ($p<0.05$). During the starter period, feeding birds with lemon pulp powder and pomegranate peel powder improved body weight gain compared to the control group ($p<0.05$). Birds of all additive groups gained more than the control group in grower period ($p<0.05$). Dietary application of lemon pulp powder, apple pulp powder and pomegranate peel powder had no significant effect on overall (d 1-42) body weight gain. Starter, grower, finisher and also overall feed intake were significantly not influenced by experimental treatments ($p>0.05$). Our findings indicated that during the starter period, FCR was better in birds that received pomegranate peel powder compared to the control group. All diets supplemented with different additives resulted in better grower FCR than the control group ($p<0.05$), while finisher FCR was remainedunaffected ($p>0.05$). Feeding birds with diets containing antibiotic, lemon pulp powder and apple pulp powder improved overall (d 1-42) FCR when compared to the control treatment ($p<0.05$).In conclusion, the current findings indicated that dietary inclusion of apple pulp powder and lemon pulp powder at the level of 2% has beneficial effect on FCR and thus can be included in broilers diet as anatural alternative to chemical antibiotic.

Keywords: apple, broiler chicken, lemon, performance, pomegranate

Prevalence of *Mycoplasma gali septicum* in respiratory complexes of broiler poultry in Masjed Soleiman city by ELISA method

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Objectives: Infection with *Mycoplasma gallisepticum* has various clinical manifestations, which probably have the highest incidence of chronic respiratory disease and loss of quality of meat carcasses, which leads to the seizure of carcasses in the slaughterhouse. This study was conducted with the aim of investigating the prevalence of Mycoplasma galli septicum in the respiratory complexes of broiler farms in Masjid Sulaiman using serum agglutination and ELISA methods.

Materials & Methods: A number of 20 flocks were randomly selected from chicken farms in different areas of Masjid Suleiman city, between the ages of 3 and 6 weeks, in the months of July, August and September 2022, and blood samples were taken from the veins under their wings. After centrifugation, the separated serum samples were analyzed using serum agglutination and ELISA methods. Also, samples were taken from dead poultry tissue infected with Mycoplasma gallisepticum. It was cultured using McConkey Agar medium (Merck, Germany) and examined after being placed in a greenhouse.

Results & Conclusion: The prevalence rate of *Mycoplasma gallisepticum* serum was 28% in rapid serum agglutination method and 16.9% in ELISA method. which can be due to the sensitivity and characteristics of RSA and ELISA serology tests, as well as the high number of false positives in the rapid serum agglutination method and a statistically significant difference was observed between the two methods ($p<0.01$). The highest rate of infection with *Mycoplasma gallisepticum* was 26.3% in Tel Bozan region, The high density of poultry farming, The results of the contamination rate of broiler chickens with *Mycoplasma gallisepticum* in flocks were 25% and the contamination rate of broiler chickens with *Escherichia coli* in flocks was 35%, and no statistically significant difference was observed between the two bacteria ($p>0.05$). the highest rate of *Escherichia coli* contamination was 35% in Tel Bozan region. It is necessary to comply with health principles, biological security, correct management measures, capacity and standard density of poultry farms in different regions of Masjid Sulaiman city.

Keywords: *Mycoplasma galli septicum*, rapid serum agglutination, ELISA, *Escherichia coli*, Masjid Suleiman

Pulmonary Aspergillosis in an ostrich flockofBirjand

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Objectives: Respiratory mycosis, such as Aspergillosis, is aproblem in young ostriches and generally occuresseconadry to stress, immunosuppression, prolonged antibacterial therapy, or overwhelming exposure to the organism. The purpose of this study is to report a case of Pulmonary Aspergillosis in an ostrich flock of Birjand.

Case study: In a flock in Birjand province, 16 one to four-month-old ostriches with severe cough, loss of appetite, weakness and losing weight were observed and finally died. Before dying, the manager of the farm use administration of fosfomycin calcium, but it did not have effective role in reducing symptoms.Post mortem examinationshowed white and gray nodules on the air sacs of the carcasses.No gross abnormal changes were observed in any other organs.In **Arad Veterinary Laboratory, t**he nodules were cultured in Sabourad dextrose agar (Merck) and incubated at 25 for 5 days and Aspergillus was isolated from all samples of the affected air sacs.

Results & conclusion: Nowadays ostrich is a farm animal in different countries. So its medical problems like aspergillosis can be a severe flock problem causing high morbidity and mortality in young chicks. The fact that Aspergillus were cultured from all the affected birds, strongly suggests that this was a brooder borne infection.Therefor disinfection of the hatchery post hatch with formalin and potassium permanganate and frequent change of litter with new dry hay prevented further cases.

Keywords: Pulmonary Aspergillosis, ostrich, nodule, air sac, Birjand

Determination of Colicin-producing genes in Escherichia coli isolated from Turkey in Bardsir city

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Objective: Colicins are proteins produced by and toxic for some pathogenic strains of *Escherichia coli*. Bacteriocins are protein compounds produced by a wide range of bacteria that result in the elimination or inhibition of competing strains. Among the different types of bacteriocin, colicinis of special importance. Almost one third of *Escherichia coli*strains have the ability to produce at least one type of colicin, and some pathogenic *Escherichia coli* bacteria strains are also capable of producing colicin. The production of colicin by coliforms that are normally present in the intestine prevents the growth of pathogenic agents and thus contributes to resistance of animals against pathogenic agents. Colibacillosis is one of the most important diseases in poultry which can be caused by pathogenic *E.coli* strains. In this study, the frequency of colicin producing *Escherichia coli* trains in turkeys in Bardsir city has been investigated. The results of this study can lead to coming up with more efficient treatment and control strategies for turkeys.

Materials & Methods:102 *E. coli* isolates from turkeys were obtained using sterile swabs and confirmed by biochemical methods including IMViC tests. DNA of the isolates were extracted by boiling method and PCR test was performed to detect and track Col E1 and Col Y.U genes.

Results & Conclusion: Amongst 102 E. coli isolates, 14 isolates (13.73%) had E1, and 3 isolates (2.94%) had Y.U. Considering the importance of synogenic general strains as beneficial microorganisms, it can be concluded that Col E1 is more ecologically important generalization caused by Escherichia coli in turkeys than Col Y.U. Presence of colicin in the gastrointestinal tract can be an important factor for inhibition of other pathogenic strains which requires more research.

Keywords:*Escherichia coli*, Colicin, Turkey, Bardsir

Investigating the prevalence of adenoviruses in different psittacinespecies and determining its subtype and strain

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Objectives: The aim of this study is to investigate the adenoviruses isolated from psittacine and the types of strains isolated from these species around the world.

Materials & methods: Adenoviruses are a diverse group of viruses that exist in a wide range of animal hosts. The psittacine adenovirus (PsAdV) has been reported as the second lethal pathogenic virus in psittacine species, with thePBFD (Psittacine Beak and Feather Disease)virus being the first. Adenoviridae family members are non-enveloped double-stranded DNA viruses with an average genome of 26-45 kbp. There are three genera in the Adenoviridae family that have been identified in bird species, including Aviadenovirus, Atadenovirus and Siadenovirus. Adenoviruses from different species of psittacine, including Budgerigars, Cockatiels, Umbrella cockatoos, Sun conures, Scarlet-chested parrots, Orange-bellied parrots, Red-crowned parakeets and Eastern Rosellas has been separated from different parts of the world. As a family, adenoviruses are commonly transmitted through the fecal-oral route. In chickens, vertical transmission and transmission through feather dander has also been reported. Affected birds have clinical symptoms including lethargy, acute depression, weight loss, crop stasis, leukocytosis, diarrhea, cloacal bleeding and even feather abnormalities,macroscopic symptoms includemultifocal necrosis of the liver and spleen andinterstitial nephritis andmicroscopic symptoms include liver andbiliary fibrosis and large basophilic intranuclear inclusions body inside liver cells, kidney tubule epithelium and collecting duct epithelial cells, spleen, proventriculus and intestinal mucosa, which in acute cases are often associated with the death of the patient. In North America, DNA in situ hybridization is the method of choice for PsAdV detection. To isolate the virus, immunohistochemical methods, serological assays, PCR and nested PCR have also been used. Adenoviruses isolated from psittacines belong to the genus siadenovirus. In the genus siadenoviruses, groups PsAdV-1, PsAdV-2, PsAdV-5, PsAdV-8, PsAdV-9 and PsAdV-10 have been isolated from psittacines. In most cases,isolated siadenoviruswas of PsAdV-2 type. Currently, there is no vaccine available for PsAdV. As a result, the spread of infection is limited by preventing the spread of virus particles and proper disinfection of fomites.

Results and discussion: Adenoviruses have been reported as the second lethal pathogenic virus in psittacine species. By molecular investigation of adenoviruses isolated from psittacines with symptoms such as liver and kidney problems and sudden death due to it, the genus siadenovirus has been isolated from psittacines and in this genus, the most isolated group is psittacine adenovirus type 2 (PsAdV-2).

Key words: adenovirus, siadenovirus, psittacine, PsAdV-2, PCR

Surgical removal of gizzard metallic foreign body in a chicken

(A case report)

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A chicken weighting 800 gramswas admitted to the clinic with melena. It had been treated with nistatin, enrofloxacin and anthelmintics for a week in another hospital but the melena wasn't resolved. In radiographs there was a large solitary metallic foreign body in gizzard and MBD (Metabolic Bone Disease) was also present. It was stabilized with administration of charcoal, sucralfate and subcutaneous injection of Edetate Calcium Disodium (CaEDTA).

Surgery was performed 48 hours after the initial treatment with CaEDTA. Anaesthesia induced using Ketamin/Diazepam (0.1 mg/kg-0.5 mg/kg). An incision was made in the abdomen from the left sterna notch posteriorly, midway between the xyphoid process and the os pubis. The gizzard was exposed and contents were completely removed.The gizzard was sutured with simple continuous sutures with 2-0 polyglactin 910 sutures. Treatment continued with 50 mg/kg CaEDTA (subcutaneous, every 48 hours) and enrofluxacin. The chicken fed on soy flour and wheat flour for a week. The fecal color returned to normal after surgery. Skin sutures removed 14 days after surgery. MBD was managed with diet modification and calcium and vitamin D supplements.

In cases of melena in birds, it is important to rule out metallic foreign bodies in initial examinations. Single large metallic foreign bodies especially in gizzard and crop, should be removed surgically but small and multiple metallic foreign bodies can be successfully treated with CaEDTA, charcoal and sucralfate.

Key words: Foreign body, Metallic foreign body, Chicken gizzard surgery, surgical removal of foreign body, Metal poisoning

Investigation of the resistance of Escherichia coli isolated from ornamental birds infected with colibacillosis in Tabriz city in 1401

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Background and purpose: General bacillosis is a type of bird disease. There are several serotypes of Escherichia coli in the environment of domestic animals and birds. E. coli is a gram-negative bacillus of the Enterobacteriaceae family and an opportunistic organism of which only a few serotypes are pathogenic in humans, birds and domestic animals. E. coli is part of the natural flora of the digestive system of birds.

Research method: In this study, firstly, during a period of approximately three months in 1401, cases of ornamental birds referred from Tabriz, which had symptoms of general bacillosis disease, were collected. Then, samples were taken from the general bacillus lesions. In order to identify the mentioned bacteria, culture in differential media and biochemical tests were used, after determining the serotype, antibiogram test in Mueller Hinton agar culture medium using imipenem, meropenem, cefepime, ceftazidime discs. Ceftizoxim, ciprofloxacin, amikacin, cefazolin, enrofloxacin, fosfomycin, danofloxacin, tetracycline, doxycycline, sultrim, erythromycin and amoxicillin were performed.

Findings: The results show that the positive samples for the presence of Escherichia coli in ornamental birds, all the suspected samples for coli bacillus were clinically positive. Also, during the antibiogram examination, the resistance of the studied samples to ceftazidime 60%, cefepime 50%, cefazolin 44%, amikacin 40%, doxycycline 31%, ciprofloxacin 30%, enrofloxacin 30%, erythromycin 27% respectively. ,imipenem 15%, ceftizoxime 10%, meropenem 7%, tetracycline 7%, danofloxacin 2%, fosfomycin 2%, sultrim 1%, amoxicillin 1% were reported. Therefore, the results of the antibiogram indicated the resistance of Escherichia coli isolated from ornamental birds to some antibiotics.

Conclusion: According to the drug resistance obtained in this research, it can be concluded that there is a risk of increasing the antibiotic resistance of Escherichia coli among the ornamental birds of Tabriz infected with Escherichia coli.

Key words: Escherichia coli, microbial isolation, antibiotic resistance, antibiogram, Tabriz

Production of a dietary functional super gel and evaluation of its effect on growth performance, carcass characteristics, and immunity response of turkey chicks

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Abstract

This study was conducted in order to produce functional super gel and assess its feeding on growth performance, carcass characteristics and humoral immunity of native turkey chicks. Super gel was produced by using gelatin powder, soybean peptide, corn, dextrose, fortified Spirulina microalgae, grape seed extract, thyme extract, garlic extract, vitamins, minerals, multi-enzyme and probiotic based on B.L and in regards to turkey chicks' requirements. In order to evaluate the effect of feeding this nutritious super gel on biological traits of turkey chicks, a total of 200 Bronze turkey chicks (mixed sex) was used. This study was done by completely randomized design with 5 treatments, 5 replicates, and 8 chicks per replicate for 5 weeks. The experimental treatments were as below: 1- early feeding with stater diet and water, 2- fasting for 48 hours, 3- super gel formula 1 feeding for 48 hours, 4- super gel formula 2 feeding for 48 hours, 5- super gel formula 3 feeding for 48 hours. The results showed that the chicks fasted for 48 hours had lower BWG compared with other groups ($P<0.05$). Chicks fed with formula 1 of the functional super gel had lower feed conversion ratio compared with control and fasted groups ($P<0.05$). Mortality of the fasted group was 5% that was higher compare with other groups ($P<0.1$). The cost of feed per 1 kg gain was lower in turkey chicks fed with super gel formula 1 compared with control and fasted groups ($P<0.01$). Production efficiency index was lower in chicks deprived from feed and water ($P<0.001$). Dietary treatments had no significant effect on carcass characteristics and humoral immunity response ($P>0.05$). The villus to crypt depth of jejunum was higher in turkey chicks fed with different formula of the functional super gel compared with control group ($P<0.01$). Absorption area of jejunum villi was greater in turkey chicks fed with formula 1,2 and 3 of the functional super gel compared with water and feed excluded group ($P<0.001$). Also, absorption area of jejunum in turkey chicks fed with formula 1 of the functional super gel was higher compared with the control group ($P<0.001$). In general, the results of the present study showed that feeding functional super gel immediately after hatch of turkey chicks had positive effect on the performance, feed cost of 1 kg gain, and jejunum morphology of the birds and its usage is recommended to turkey producers.

Keywords: immunity, turkey chicks, super gel, growth performance.

Comparative evaluation of performance and health indicators of SabzdashtIntegration System from 1395to 1401

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Objectives: One of the development programs in the country's poultry sector is expansion of Integration Systems and improvement of efficiency in the Industry. In this article, the focus has been put on investigating performance factors of broiler flocks of an integration system (Sabzdasht), like mortality, ADG, FCR, EEF, and Carcass yield, as well as vaccination & medication programs, Anticoccidial plans and etc.These performance factors have been statistically compared monthly, seasonally and annually Since 2015 until summer of 2022.

Materials & Methods: Data under investigation include weight, mortality, consumed feed, medication and vaccination programs. These data are collected daily from all of the farms. The slaughterhouse regarding data, astransportation weight loss of live birds, slaughter yield as well as farm yield was collected from the slaughterhouse. All of the data is classified monthly, seasonally and annually and was statistically compared in the SPSS software.

Results & Conclusion: Statistical comparison of mortality rates shows that the mortality rate in fallsare significantly the lowest (Spring :6.76%, Summer:6.36%, Fall:5.9%, Winter:6.61%)The lowest mortality rate is in fall of 1398.The weather condition in Gilan Province in falls is the main cause of lower mortality rates in this season. The lowest EEF is reported in summer and the lowest of all is reported in the summer of 1394. Genetic improvementsare responsible for the growing and improving of EEF through the years. As it is mentioned in the data the EEF in summer of 1394 is calculated 257 and in summer of 1401, it improves to 312. Improvement of management practices and improving feeding and vaccination programs can be another factor improving the EEF. The best EEF numbers are from fall and winter of 1398. Carcass yield in winters are the lowest. The ratio of medication expense to the total expenses is about 5.48% which is growing significantly from fall of 1399 which can be due to the variation of the exchange rate of Rial to USD. The lowest medication used is in summers. Serological investigation for detecting disease outbreaks reveals outbreaks of ND and AI. Despite administration of killed vaccines against both diseases, the seasonal outbreaks or coinfection with other diseases has been reported.Type of vaccines and their administration method proved to have important effects on disease outbreaks specially IB and AI.

Keywords: Mortality, Average Daily Gain,Feed Conversion Rate,European production Efficiency Factor,Yield, Vaccination, Medication.

The first Occurrence of Hepatitis-Hydropericardium Syndrome (HHS) and inclusion body hepatitis (IBH) in the affected broiler chicken flock in Birjand province, Iran

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Objectives: Hepatitis-hydropericardium syndrome (HHS) and inclusion body hepatitis (IBH) are tow economically important diseases in broiler chicken flocks, particularly of 3- to 6-week-old, caused by fowl adenoviruses and characterized by its sudden onset, with high mortality ranging from 20% to 70%.The purpose of this study is to report the first occurrence of Hepatitis-Hydropericardium Syndrome (HHS) and inclusion body hepatitis (IBH) in the affected broiler chicken flock in Birjand province, Iran.

Case study: In July 2022, a 24-day-old commercial broiler flock in Birjand province showed a 30% mortality rate. Birds were subjected to postmortem examination. Tissue samples of liver were fixed in 10% buffered formalin and send to the pathology laboratory for histopathology testing. A total of 12 pathological sections were prepared. Gross lesions of HHS were included hydropericardium with an unusual accumulation of jelly-like fluid in the pericardial sacand discolored and mottled liver and petechial or ecchymotic hemorrhages. In histopathological examination, the following were observed: liver hyperemia, scattered hemorrhages, degeneration, scattered necrosis of hepatocytes, mild and diffuse infiltration of edematous cells with a predominance of mononuclear cells in the liver parenchyma, the presence of basophilic inclusions in the nucleus of hepatocytes.

Results & conclusion: The acute high mortality, age of the broilers, gross lesions and histopathological findings were attributable to the adenovirus (HHS & IBH). In this syndrome, vertical and horizontal transmission plays an effective role in spread of the disease. In ourregion, the entire affectedflock was obliterated. The reason for disease control in the region was use of histopathological testing, quick diagnosis of disease, and close collaboration between governmental and private sectors.

Keywords:adenovirus, broiler, hepatitis, inclusion body, Birjand

Seroligic survey of Hemorrhagic Entritis virus infection in some turkey flocks

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Supervisor: Dr.seyed Ahmad Madani

Despite the growing population of commercial turkeys in Iran, there is scarce information about turkey diseases in the country. Haemorrhagic enteritis is an infectious viral disease of turkeys. It is a highly contagious adenovirus infection which can cause severe haemorrhagic enteritis and mortalities in the turkey industry. In the present study, 447 turkey serum samples were collected from 25 turkey flocks located in eight different provinces including: Tehran, Qom, Isfahan, Hamedan, Markazi, Semnan, Mazandaran, and Ghazvin. The serum specimens were evaluated for the presence of antibodies against Haemorrhagic Enteritis Virus (HEV) using commercial enzyme linked immunosorbent assay (ELISA). Eleven (44%) flocks and 213 (47%) serum samples from seven provinces were positive. All the specimens from the only sampled flock in Semnan were within the suspected range. It can be concluded that HEV is prevalent in Iran's turkey flocks and further investigations and measurements are required to control the infection in the country.

Keywords: Turkey, Haemorrhagic Enteritis Virus, ELISA, Serology.

Molecular identification and phylogenetic analysis of avian influenza virus H9N2 in backyard chickens in rural areas of Fars province, Iran

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Objectives: Avian influenza virus belongs to genus A of Orthomyxoviridae family andonly this genus is pathogenic in birds. Backyard chickens all over the world, especially in the MiddleEast, play an important role in feeding people. These birds can also play a significant role in theepidemiology of AI and the spread of the virus to commercial poultry flocks. Therefore, the aim ofthis study was to investigate H9N2 influenza virus in backyard chickens of rural areas of 30 countiesof Fars province, Iran using molecular methods.

Materials and Methods: In this study, from July 2019 to January 2020, tracheal and cloacal swabswere taken from backyard chickens of rural areas of Fars province, Iran for virusisolation in order to detect H9N2 infection and identification of possible isolates.Confirmation and subtyping of HA positive isolates were done by RT-PCR method. The PCR product was purified using PCR product purification kit, then the Purified DNA fragment was sequenced in both directions through Sanger method with ABI 3500 Genetic analyzer system.

Results & Conclusion: In RT-PCR testwith H9 specific primer, only one isolate was positive demonstrating the band of 488bp whichconfirmed by sequencing. According to comparative alignment and phylogenetic analysis this strainwas closely related to the strain D1 in the gene bank. This subtypecan potentially undergo the gene combinationfor infecting human and other mammals.For this reason, continuous monitoring andsubtyping of AIV viruses among differentavian flocks and evaluation of viral geneticchanges throughout the years is of highimportance.Phylogenetic analysis of hemagglutinin genesequence in the present study was partial cdscontaining 474 bp nucleotides, in other words,containing 158 amino acids that does notinclude cleavage site and receptor binding site.Because strains D1 and D7 have the mostsimilarity to our strain, they probably evolvedfrom the A / Chicken / Iran / ZMT-101/1998strain with JX465626 accession number. Ourstrain also has the most similarity (99.16%)among foreign strains to Saudi Arabia strainA/Chicken/Saudi Arabia/CP7/1998/ (H9N2).

Keywords: backyard chickens, tracheal and cloacal swabs,RT-PCR, Phylogenetic analysis.

Isolation and identification of *Clostridium baratii* inorganicbroiler flocks of Kerman province

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Objectives:*Clostridium baratii*is an anaerobic, Gram-positive rods, spore-forming bacteria.The purpose of this study is to isolate and identify*C.baratii*, which is one of the causes of clostridial enteric diseases in poultry, from organicbroiler farms in Kerman province.

Materials & Methods:Diagnosis of*C. baratii*was by examination of macroscopic and microscopic lesions and isolation of *C. baratii* from the intestine and liver of the chickens.In this study, 146 samples were taken from the intestines ofbroilers.They were cultured on blood agar medium containing 5% defibrinated sheep blood and placed in anaerobic jarsfor 48 hours at 37°C.After three rounds of purification, they were cultured in Reinforced *Clostridium*medium under anaerobic conditions and colonies examined in terms of appearance, gram staining and catalase test.After that, the biochemical tests including gelatinase, lecithinase, lipase, indole, milk decomposition, fermentation of sugars (glucose, lactose, sucrose, and maltose) and motility test was done on positive clostridial isolates and C. *baratii* strains were identified from the others based on microscopical and biochemical results.

Results&Conclusions: Out of all samples, 149 isolates were identified as *Clostridium*spp.and the rate of C. *baratii* positive isolates based on microscopical and biochemical tests were 15 (10.5%). Results of this study showed the presence of *C. baratti* contaminations inorganicbroiler farmsand these results clarify the need for more research in this field.

Keywords:*Clostridium baratii*,Organic broiler farms, Culture, Biochemical

Isolation and Characterizationof *Clostridium perfringens* in ostriches in south of Kerman

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Objectives: The purpose of this study is to isolateand characterize *Clostridium perfringens*fromostriches in south of Kerman province. Identification of isolates was based on the establishedmorphological criteria and theconventional biochemical tests.

Materials & Methods:In this study,125 stool samples were taken from 10 ostrich farms, located insouth of Kerman province. They were cultured on blood agar medium containing 5% defibrinated sheep blood and placed in the anaerobic jarsfor 48 hours at 37°C. Colonies which showed *Clostridium*characteristic dual hemolytic zones were selected and checked for purity on a Tryptose Sulfite Cycloserine agar (TSC agar)that produce black colonies on that.The isolate identity was established based on the colony morphology, hemolysis pattern, Gram staining morphology and the conventional biochemical characteristics including catalase, gelatinhydrolysis, indole, motility, glucose, lactose, maltose, sucrose, mannitol, oxidase and lecithinaseactivity forconfirmation the phenotypic characteristics of the isolates were consistent with that described as *C. perfringens.*

Results and Conclusions: The cultural and biochemical analysis showed that *C. perfringens* was present in 21.14% (37/175) faecal samples while the rate of the other *Clostridia*was 9.7% (17/175). So the data presented inthis study confirm that *C. perfringens* is the most prevalentamong *Clostridium* isolates fromostriches insouth of Kerman. In addition, the study emphasizing on molecular evaluation on this isolates on future researches.

Keywords:*Clostridiumperfringens*, Ostrich,Culture ,Biochemical, South of Kerman

Molecular Investigation of *fimC, iucD, tsh* and *papC* from *Escherichia coli* O78 Isolated from the Yolk Sac of 1 to 7-day old Broiler Chicks in Ilam Province

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Objectives:Yolk sac infection *Escherchia Coil* of broiler chickens is major cause during the first week post – hatching. It may cause 100% mortality but the mortality rate is usually between 5% and 10%. On the other hand, awide range of Extraintestinal pathogenic Escherichia coli (EXPE) occur, which is very important to identify the causative agents and ways to prevent it.

Materials & Methods: In this research 600 samples (from 120 farms) were randomly taken from called chicks (1 – 7) days during the one-year period.After DNA extraction, the PCR molecular method was used to evalutev the presence of *fimC, tsh, iucD* and *papC* virulence genes.

Results & Conclusion: The result showed that 30 sample (5%) from isolated bacteria were *E.coli*. The frequency of *fimC* 28 (93/33), *tsh* 23 (76/66), *iucD*19 (63/33) and *papC* 18 (60%) genes was in the isolates. All of the studied genes were present in poultry isolated, as well as from chickens aged one to two days, not isolated from *Escherichia coli*. According to the identification of *fimC, tsh, iucD ana papC* genes, it can conclude that these genes can be considered as effective factors in the extraintestinal presence of bacteria. Among them, *fimC* and *tsh* genes, due to having the highest prevalence, are likely to cause *Escherichia coli* pathogens in this region. Fecal contamination of eggs is considered to be the most important source of infection. So, fumigating or disinfection of eggs within 2 hours after they are laid could reduce contamination rate.

Keywords: Yolk sac infection, Broiler chickens, *Escherichia coli*

Molecular survey of Microsporidia, *Blastocystis*, *Cryptosporidium* and *Giardia* in pet avian species in Tehran, Iran

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Objectives: *Giardia*, *Cryptosporidium*, microsporidia and *Blastocystis* are gastrointestinal infectious agents in humans a wide variety of animals and birds. The close contact of humans and companion avian birds, and the presence of zoonotic species and genotypes of these microorganismsmade the avian hosts a risk factor for human infection.This study was conducted with the aim of searching and tracking the above parasites in the feces of pet birds using parasitological and molecular methods in Tehran.

Materials & Methods: In the current study, fecal samples of avian birds were collected and investigated withmodified Ziehl–Neelsen, modified trichrome and trichrome staining for the presence of microsporidia, *Cryptosporidium*, *Blastocystis*and *Giardia*. All the samples were examinedmolecularly with specific primers and PCR method as well. The PCR product obtained from the positive samples were sequenced and the sequence results were subjected to phylogeny analysis with the relevant software**.**

Results & Conclusion: In this study, 150 fecal samples from pet birds from 17 bird species belonging to four bird orders and eight avian families were examined. In the microscopic examination, the above-mentioned pathogens were not observed. *Cryptosporidium*, *Giardia* and *Blastocystis* infections were not reported in the molecular method. Microsporidia was observed in three samples by PCR method, and after sequencing and data analysis, the samples were diagnosed as *Encephaltozoonhellem*. AGreen cheek parrot (*Pyrrhuramolinae*), a gray parrot (*Psittacus erithacus*) and a lovebird (*Agapornis*) were infected. Pet birds may act as a source of microsporidian agents. The resistant spores, besides the subclinical infection in birds, put the owners, especially children and elderly with impaired immune systems, at increased risk of disease acquisition via spore inhalation or ingestion. Further studies includingwider sampling population and use of multi-loci molecular diagnostics may help to evaluate the role of pet birds in the epidemiology of zoonotic opportunistic pathogens.

Keywords: Avian, *Cryptosporidium*, *Giardia*, *Blastocystis*, *Microsporidia*, *Encephaltozoonhellem*, Zoonosis.

Investigation of *Bla*, *tem*, *blactxm1*, *blacmy1*, and *cfosA3* genes in *E. coli*Samples Isolated from Fecal Samplesof Poultry in Ilam Province

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Introduction:Colibasilosis is a common disease in broiler breeding units that has caused many losses due to bacterial resistance and excessive use of drugs over many years. Colibasilosis occurs in all species of domestic birds and at different ages, but the infection in birds is more common in adults than in adults and occurs more often between the ages of 4 and 9 weeks.

Methods: In this study, four birds were sampled from four different poultry farms in Ilam province. From each poultry farm (15 days, 25 days, 35 days and 45 days), samples were taken from the entrance, water, donut and from each of the three cultivars, a total of 192 cultivations were performed and 72 isolates of *E. coli* were obtained from fecal samples of poultry. The antibiotic susceptibility testing was determined according to the CLSI guidelines based on the gel release methodand the presence of *Bla*,*tem*, *blactxm1*, *blacmy1*, and *cfosA3* genes in *E. coli* samples isolated from poultry stool by PCR method and the antibiotic susceptibility pattern of these strains was determined.

ResultsandConclusion: The results of antibiotic susceptibility test showed that the least and highest resistance was respectively cefazolin (77.2%) and ampicillin (83.33%) respectively. Twenty-five strains (34.77%) had blatem gene, 16 (22.20%) strains had the *bla ctxm-1* gene, 13 (18.10%) had *bla* cmy-1 gene and 18 (25%) strains had *cfosA3* gene. The result of this research shows that the incidence of the frequency of these gene has been increased during the time.

Keywords: Clinical basis, *Escherichia coli*, PCR, Plasmid, Cefazolin

Synergistic effects of neuromedin S withdopamine and noradrenaline on feed intake in 5-old-day chickens

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Objectives: Various peptides are involved in feed intake regulation in bird and mammalian brains. Dopamine andnoradrenalineplay an important role in feed intake control. On the other hand, neuromedin S (**NMS**) decreases feed intake. This study aimed to investigate the synergistic effects of dopamine andnoradrenalinewith a sub-effective dose of NMS on feed intake in neonatal chickens.

Materials &Methods: A total of 36 neonatal Hyline W80 chicks were randomly divided into three experimental groups. Each experiment had a control group and three treatment groups (n=12 in each group). In all experiments, 3-hour feed-deprived birds received intracerebroventricularinjections of either control diluent or drug solution. Then the birds had *ad libitum* access to the feed and fresh water, and then cumulative feed intake (**gr**) was measured based on the percentage of the body. In the first experiment, the control solution, NMS (0/25 nmol), L-DOPA (dopamine precursor; 125 nmol), and NMS + L-DOPAwas injected. In the second experiment, the control solution, NMS (0/25 nmol), dopamine(10 nmol), and NMS + dopaminewas injected. In the third experiment, the control solution, NMS (0/25 nmol), noradrenaline(37/5 nmol), and, NMS + noradrenalinewas injected.

Results & Conclusion: The results showed that the injection of NMS with a dose of 0.25 (sub-effective dose) and L-dopa with a dose of 125 (sub-effective dose) had no effect on feed intake (P> 0.05).However, co-injection of NMS and L-dopa decreased feed intake (P< 0.05).Injection of NMS with a dose of 0.25 (sub-effective dose) and dopamine with a dose of 10 (sub-effective dose) did not influencefeed intake (P> 0.05).However, the co-injection of NMS and dopamine decreased feed intake (P< 0.05).Injection of NMS with a dose of 0.25 (sub-effective dose) and noradrenaline with a dose of 37.5 (sub-effective dose) had no effect on feed intake (P > 0.05).However, co-injection of NMS and noradrenaline decreased feed intake (P< 0.05).According to the results of the present study, there is probably a synergistic effect between NMS with dopamine andnoradrenaline on the feed intake control of neonatal chicks.

Keywords: Feed Intake, NMS, Dopamine, Noradrenaline, Chicken.

Peroxisome proliferator-activated receptor gamma (PPARγ) activation: A potential treatment for ascites syndrome in broiler chickens

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Objectives: Pulmonary arterial hypertension (PAH) syndrome in fast-growing broilers that is known as ascites syndrome can be assigned to imbalances between cardiac output and the capacity of the pulmonary vasculature. Peroxisome proliferator-activated receptor gamma (PPARγ), a member of the nuclearhormone receptor superfamily of ligand-activated transcription factors, plays an important role inregulating a variety of fundamental cellular processes including metabolism, proliferation, andinflammation. The present study aimed to investigate the effects of the activation of PPARγby ligandsinthe prevention of pulmonary arterial hypertension (PAH) syndrome in broiler chickens.

Materials and Methods:

A total of 300 one-day old (Ross 308) male chicks were randomly allocated to four treatment groups with five replicates of 15 birds each. The following treatments were used: 1) normal ambient temperature (negative control), with basal diet; 2) cold-induced ascites (positive control), with basal diet; 3) induced ascites, with basal diet + 10 mg/kg/day pioglitazone and 4) induced ascites, with basal diet + 1% of fish oil (FO). At 42 d of age, two birds were randomly taken from each replicate and killed. The weight of the heart ventricles was determined, and the right ventricle was dissected from the left ventricle and the septum, which were then weighed separately. The birds with the right ventricle as a percentage of the total ventricle (**RV:TV ratio**) greater than 0.25 as ascites heart index (**AHI**) and with the accumulation of abdominal fluid were considered ascites. We calculated the percent of mortality of treatments at the end of every week.

Results & Conclusion: Ascites heart index (**RV/TV**) was significantly ($P < 0.05$) reduced in chickens receiving FO (0.20) and pioglitazone(PIO) (0.21) compared to the positive control group (0.26). Our results showed that broilers in the control group under cold-induced ascites had the highest mortality, while fish oil and pioglitazone treatments significantly reduced the mortality ($P \leq 0.05$).

In conclusion, PPARγ agonist pioglitazone and fish oil as a source of omega-3 polyunsaturated fatty acid could be used as a new strategy to reduce the negative effects of pulmonary arterial hypertension and ascites in broiler chickens.

Keywords: Ascites,Broiler chickens, Fish oil, Pioglitazone,PPARγ

Effect of Yarrow Extract on Blood Parameter and Intestinal Bacteria of Broilers

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Objective: The aim of this study was to investigate the effect of different concentrations of aqueous extract of yarrow (*Achilleawliihelmsii)* leaf and flowering heads on blood parameters and population of some ileal bacteria of broiler chickens.

Materials & methods: Using a completely randomized design a total of 260 Ross 308 day-old broiler chickens (male and female) were allocated to 5 experimental treatments (4 replicates, 13 birds each) and reared for 42 days. During the rearing period, each experimental group was fed with one of the following diets: a basal diet without additive (as the control control), basal diet added with antibiotic (50 g/ton, erythromycin), basal diet added with 25% yarrow extract, basal diet added with 50% yarrow extract and basal diet added with 100% yarrow extract. The chicks were fed with starter, grower and finisher diets from 1 to 10, 11 to 24 and 25 to 42 days of age, respectively. At the end of rearing period (42 d of age), 4 birds were chosen from each treatment, slaughtered and blood and ileal samples were taken to determine the concentration of blood metabolites (triglycerides, cholesterol, LDL and HDL) as well as population ofileal*Lactobacillus* and *E. coli* bacteria. In addition, carcass yield and relative weight (% of live body weight) of different carcass parts (wings, thighs, breast) were calculated.

Results and conclusion: The results indicated that dietary supplementation with antibiotic and different levels of yarrow extract had no significant effect on the concentration of blood metabolites (triglycerides, cholesterol, LDL and HDL) (P>0.05). Also, population of ileal*Lactobacillus* and *E. coli* was significantly not affected by experimental treatments (P>0.05). Carcass yield in chickens fed 25 and 50% extract significantly was higher than the control group, while relative weight of wings, thighs and breast was remained unaffected(P>0.05). In conclusion, the findings indicated that under the condition of the current study,dietary inclusion of antibiotic and yarrow extract had no significant effect on ileal bacteria count and blood metabolites, whereas application of 25 and 50 % yarrow extract could improve carcass yield of broilers.

Keywords: *Achilleamillefolium*, blood parameters, broiler chicken, intestinal bacteria, yarrow

Evaluation of Growth Promoting Effect of Some Fruit Waste in Broiler Chickens

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Objective: This experiment was designed to investigate the possible growth-promoting activity of different fruit wastes (pomegranate peel powder, lemon pulp powder and apple pulp powder), as natural alternatives to chemical antibiotic, on the performance traits of broilers.

Materials & methods: A total number of 260 male and female 308 Ross broiler chicks were distributed in a completely randomized design among 5 experimental treatments with 4 replicates of 13 birds each. During the rearing period, the control group was received a basal diet without any additive, while other birds in groups 2 to 5 were fed same basal diet supplemented with antibiotic (50 g/t, Erythromycin), 2% pomegranate peel powder, 2% lemon pulp powder or 2% apple pulp powder. Isonitrogenous and isocaloric starter, grower and finisher diets were provided from 1 to 10, 11 to 24 and 25 to 42 d of age, respectively. Body weight and feed intake were measured at the end of the starter, grower and finisher phases of the experiment. Also, body weight gain (BWG) and feed conversion ratio (FCR) were calculated for each experimental period.

Results and conclusion: The results showed that performance parameters such as BWG and FCR were significantly influenced by experimental treatments ($p<0.05$). During the starter period, feeding birds with lemon pulp powder and pomegranate peel powder improved body weight gain compared to the control group ($p<0.05$). Birds of all additive groups gained more than the control group in grower period ($p<0.05$). Dietary application of lemon pulp powder, apple pulp powder and pomegranate peel powder had no significant effect on overall (d 1-42) body weight gain. Starter, grower, finisher and also overall feed intake were significantly not influenced by experimental treatments ($p>0.05$). Our findings indicated that during the starter period, FCR was better in birds that received pomegranate peel powder compared to the control group. All diets supplemented with different additives resulted in better grower FCR than the control group ($p<0.05$), while finisher FCR was remainedunaffected ($p>0.05$). Feeding birds with diets containing antibiotic, lemon pulp powder and apple pulp powder improved overall (d 1-42) FCR when compared to the control treatment ($p<0.05$).In conclusion, the current findings indicated that dietary inclusion of apple pulp powder and lemon pulp powder at the level of 2% has beneficial effect on FCR and thus can be included in broilers diet as anatural alternative to chemical antibiotic.

Keywords:apple, broiler chicken, lemon, performance, pomegranate

A case report of Mycoplasma synoviae infection in aGrandparent flock without clinical signs

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Objectives: Avian Mycoplasmosis is one of the most important diseases in the poultry industry. Mycoplasma synoviae (MS) is one of the causative agents of infectious disease in chicken and turkey flocks, which causes respiratory disease, movement disorders, growth reduction, egg production decline, and reduction in the number ofhatched chicks, which leads to significant economic losses to the poultry industryaround the world.

Material & Methods: In this study, Mycoplasmasynaviaeinfection was investigated in a 55-weeks-old Grandparent(GP) flock without clinical symptoms using serological methods. For this purpose, 180 blood samples were randomly collected from the wing veins of birds from six barns, 30 samples from each barn. Then, in order to detect mycoplasma synoviae infection, the serum samplestested by ELISA method using BioCheck and IDEXX kits.

Result & conclusion: In ELISA tests, 56 samples out of 180 samples (31%) were positive with the BioCheck kit and 46 samples out of 180 samples (25.5%) were positive with IDEXX kit. As it was expected, the sensitivity and the rate of positive samples of BioCheck kit was significantly higher than the IDEXX kit.This study showed that Mycoplasma Synoviae can be present in the flocks without clinical symptoms and the infection can be transmitted among birds in a short period of time; therefore, biosecuritymeasures, standard chicken density and conducting regular monitoring of GP flocksare some of the most important factors in preventing and controlling the infection.

Key Words: Mycoplasma synaviae, ELISA, Grandparentflock, clinical symptoms, Monitoring.

Evaluation of emulsified pentavalent vaccine contains three avian infectious bronchitis viruses including classical and two variants

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Objective(s): The aim of this study was serology response and clinical evaluation of layers pullet vaccinated with pentavalent Medivac ND-EDS-IB variants-3 vaccine including classical M-41 and two variants of QX-like group & 793-B, in comparison with trivalent imported ND-EDS-IB (classical M-41). Note that for both vaccines the strain of ND is La Sota (G2) and for EDS is Adenovirus 127 of the McFerran strain.

Material & Methods: Under one management, two poultry houses with a capacity of 6000 each were designated for the vaccination with trivalent and pentavalent vaccines, separately.The routine vaccination program followed by vaccination of two houses with live-attenuated IB H-120 on day 1, IB 4/91 variant&IzovacClone(ND) by eye drop route on day 21, and with live-attenuated IB H-120 classical by drinking route. Then vaccination with two examined vaccines was performed on day 100. The serum samples for antibody monitoring were taken at3- and 7 weeks post-vaccination, using an ID vet ELISA kit (IBVS), an indirect method that detects IB variants. Also, clinical monitoring of birds including the egg production &mortality rate, respiratory symptoms, diarrhea, and general conditions of the growing environment, before and after vaccination was considered.

Results & Conclusion: The ELISA test results demonstrated a strong positive and high antibody titer for the pentavalent vaccinethat is comparablewith the importedtrivalent vaccine. Also, no adverse reactions or clinical signs related to the pentavalent vaccine were observed implying a safe vaccine was employed.

Keywords: Infectious bronchitis virus variants, Emulsified pentavalent vaccine, Medivac,

Comparison of effects of using garlic, nettle (urticadioica) and antibiotics on immunity, performance and some blood parameters of broiler chickens.

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Objectives: Taking advantage of medicinal plants is developing in the poultry industry as an easy, economical and beneficial way in order to elevate the poultry's outcome. The authorities forbidden many growth promotors, such as overuse of antibiotics leads to danger of decrease bacterial resistance.

Materials & Methods: In this study, we investigated the effect of garlic, nettle (Urticadioica) on broilers compared to antibiotics. Arbor Acres chickens were divided into 4 groups with 3 repetitions. First group as control group received only basal diet, second group was treated by 0.5 g/kg flavophospholipol as antibiotic growth promoter, third group was treated by 1 g/kg garlic powder, the fourth group received 1 g/kg nettle (Urticadioica) powder. All the other conditions were the same for all the groups.

Results & Conclusion: After 50 days of treatment immunity system, performance and some blood parameters were analyzed. There were significant differences in in garlic, nettle (Urticadioica) and antibiotic groups with feed conversion ratio from performance, body weight gain, antibody titer, heterophils/lymphocytes ratio, triglyceride from blood parameters and albumin from immune system. Cholesterol level was lower in garlic and nettle (Urticadioica) groups. According to the results, garlic and nettle (Urticadioica) can be used as a good alternative for commercial antibiotics.

Keywords: garlic, nettle (Urticadioica), antibiotics, carcass, immunity, performance, blood parameters

Comparison of effects of using black pepper, yogurt and antibiotics on carcass, immunity, performance and some blood parameters of broiler chickens.

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Objectives: Taking advantage of medicinal plants is developing in the poultry industry as an easy, economical and beneficial way in order to elevate the poultry's outcome. The authorities forbidden many growth promotors, such as overuse of antibiotics leads to danger of decrease bacterial resistance.

Materials & Methods: In this study, we investigated the effect of black pepper and yogurt on broilers compared to antibiotics. Arbor Acres chickens were divided into 4 groups with 3 repetitions. First group as control group received only basal diet, second group was treated by 0.5 g/kg flavophospholipol as antibiotic growth promoter, third group was treated by 1 g/kg black pepper powder, the fourth group was fed by basal diet plus 5 g/kg yogurt. All the other conditions were the same for all the groups.

Results & Conclusion: After 50 days of treatment immunity system,performanceand some blood parameters were analyzed. There were significant differences in black pepper, yogurt and antibiotic groups with control groups in feed conversion ratio from performance, body weight gain, antibody titer, heterophils/lymphocytes ratio, triglyceride from blood parameters and albumin from immune system. Cholesterol level was lower in black pepper groups. Yogurt showed significantly improvements in some factors. According to the results, black pepper can be used as a good alternative for commercial antibiotics.

Keywords: black pepper, yogurt, antibiotics, carcass, immunity, performance, blood parameters

Foreign Body in Cockatiel crop, a case report and its surgical treatment

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Objectives: A cockatiel was referred to the clinic with clinical symptoms of anorexia, lethargy, depression, weight loss, partial lameness, dyspnea, breathing with open beak, vomiting. The suspected clinical signs were foreign body ingestion by the bird, a foreign body (hair puller) was palpated by palpating the crop.A radiograph was taken from the bird to accurately determine its location.

Materials & Methods: In the radiological evaluation of the bird, a foreign body was identified in the crop and surgical intervention was chosen to remove it. After preparing the involved area for surgery, first the bird was anesthetized by inhalation anesthesia and using isoflurane gas. Then, to remove the foreign body, the bird was placed in a dorsal recumbency. Then, the crop was approached through a 2 cm skin incision and the foreign body was removed from crop. Then, the crop was sutured with absorbable sutures with a purse string suture pattern and the skin was closed with non-absorbable sutures with a simple interrupted suture pattern.

Results: With the investigation and follow-up of the bird, full recovery was achieved.

Conclusion: Foreign bodies are common in the gastrointestinal tract of dogs and cats. The presence of foreign bodies in the gastrointestinal system of some species of birds causes the obstruction of the crop, pre-ventriculus, ventriculus and intestines. The most common location of foreign bodies in birds is in the crop and pre- ventriculus, although linear foreign bodies can enter the intestines. Ingestion of foreign body in birds may be the result of their curious nature or forced pumping of food for them. The presence of foreign bodies in the gastrointestinal system of birds is usually diagnosed by history, radiological findings, laboratory tests and clinical symptoms. Foreign objects can include artificial or natural fibers, wood, stones, feathers, metal and plastic. Environmental stress (for example, significant changes in habitat, carelessness of the bird's owner, and dramatic changes in housing) can cause foreign body ingestion. Neurological symptoms may be observed due to ingestion of heavy metals such as lead. Foreign bodies can cause partial obstruction of the respiratory system and partial or complete obstruction of the gastrointestinal system. Using forceps in anesthetized birds, flashing the crop, using forceps in conscious birds and ingluviotomy are four techniques that can be used to remove foreign bodies from the gastrointestinal tract of birds. Choosing the appropriate treatment approach depends on the type of foreign body and its location.

Key words: foreign body, surgical treatment, crop, gastrointestinal system, cockatiel

Report of successful treatment of tibiotarsus fracture in a budgerigar

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Objectives:A budgerigar with a history of injury to the right pelvic limb was referred to the surgery and imaging department of the clinic. The clinical symptoms of this bird included swelling at the injury site, severe lameness, not bear weight and pain during palpation in the affected pelvic limb.For accurate diagnosis, a radiograph was taken of the involved pelvic of the bird.

Materials & Methods: In the radiological evaluation of the injured pelvic limb, a fracture of the right tibiotarsus bone body was diagnosed and orthopedic surgical intervention was chosen to stabilize the fracture fragments. After preparing the involved area for surgery, first the bird was anesthetized by inhalation anesthesia and using isoflurane gas. Then, intramedullary (IM) pin method and Altmann's external splint were used to stabilize the tibiotarsus bone fracture. After surgery the bird limited in the cage was considered for 4 weeks.

Results: With the investigation and follow-up of the bird, full recovery was achieved. The tibiotarsus bone was completely union.

Conclusion: Bird bones are thin and fragile due to their high calcium content. The femur and humerus bones in birds have air, which reduces body weight and of course helps to fly. It also helps to breathe and moisten the air entering the body.The principles of fracture management in birds are similar to mammals and include anatomical alignment and reduction with minimal disruption of callus formation, soft tissue dissection and firm fixation of fracture fragments. Intramedullary pinning can be used as a method to stabilize bone fractures in birds. The most common types of pins used in small animals are Steinman pins. A round pin that is available in a diameter of 1.5 to 6.5 mm and in different lengths from 9 to 12 inches. There is also a type of small pin called Kirschner wire (K wires) which has a diameter of 0.9 to 1.5 mm, which is more suitable for fixing broken bone in birds. Because K-wires are quite flexible, they are only used as intramedullary pins in small bones. Intramedullary pinning of the tibiotarsal bone alone without external splint support is not completely satisfactory; The reason for this is the conical shape of the muscles surrounding the tibiotarsal bone (The use of an external splint alone is not suitable for this area). However, a combination of intramodular pinning and the use of an external splint is more rational and appropriate.

Key words: Intramodular pinning, Fracture fixation, budgerigar, Surgery, Hind limb

Relieving of Hypoxia-Induced Pulmonary Hypertension Using a Novel Therapeutic Premix (Hypoxi Relief®) in Arainand Ross-308 Broiler Chickens

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Objective: The main strategy to get rid of pulmonary artery hypertension in broiler chickens is to genetically improve cardiovascular and respiration capacity. But where the oxygenation capacity of hemoglobin is reduced, pharmacological strategies and the use of metabolites effective in reducing hypoxia without slowing the bird's growth rate will compensate. The aim of this study was to evaluate the effectiveness of Hypoxi Relief® premix (containing nitric oxide precursors and endothelium protective substances) on Arian domestic commercial broilers strain (which is susceptible to hypoxia) and modern broiler resistance to pulmonary hypertension (Ross 308).

Materials & Methods: Three hundred forty-eight, one-day-old Arian commercial strain (114 male and 114 female) chicks and Ross 308 (60 male and 60 female) in a four-floor battery cage in an area with analtitude of 1,340 m above sea level were reared for 42 days. At 28 days of age, broilers were grouped in to four treatments. Controls (Arian and Ross) were fed with basal diet and two other treatment groups (Arian+HR and Ross+HR) were supplemented with HR premix (1 kg/1000 kg feed). Body weight, feed intake per cage were measured at week-6. Feed conversion ratioand mean weekly weight gain and daily weight gain were calculated. At 42 days of age, blood samples were collected from the wing veins of three birds in each cage and collected in micro hematocrit tubes were centrifuged at 13000 rpm for 5 minutes. Then the percentage of hematocrit was measured using a micro-hematocrit reader (Behdad, Labtron CO). Plasma nitric oxide (NO) concentration was measured by reducing of nitrite to nitrate by vanadium chloride, followed by quantification of nitrite by Griess reaction using a commercial nitric oxide kit (ZellBio®, made in Germany) according to the manufacturer's instructions. After preparing the samples in a 96-well plate, the color intensity of the samples was read at a wavelength of 540 nm using an ELISA device. Calibration curve was drawn by plotting absorbance values against nitrite and nitrateconcentrations (µmol) as nitric oxide metabolites.

Results & Conclusion: Average daily gain of Arian+HR significantly increased compared to Arain Control group. Feed conversion ratio (week 6) of Ross+HR significantly improved compared to Arain Control. Blood hematocrit (index of blood viscosity) significantly reduced in Ross+HR**.**Plasma NO of Ross+HR significantly increased compared to Arain Control.Obtained results showed significant improvement in physiological and growth performance of 42 days old broiler chickens, received Hypoxi relief in the feed.

Keywords: Hypoxia, Ascites, Nitric Oxide, Arian, Hematocrit

Immunization of broiler chickens with the recombinant NetB toxoid from *Clostridium perfringens*

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Objectives: Necrotic enteritis is a serious bacterial disease of poultry caused by *Clostridium perfringens*. NetB toxin from *C. perfringens*type Gis the responsible cause of necrotic enteritis. Following the withdrawal of growth-promoting antibiotics from chicken's diet, it was considered critical to control necrotic enteritis using alternative approaches such as vaccination. Up to now, no effective vaccine is available to control necrotic enteritis in birds. In the present study, we immunized the broiler chickens subcutaneously with therecombinant NetB toxoid of*C. perfringens* to evaluate the efficacy of the vaccine against the necrotic enteritis challenge.

Materials & Methods: The *netb* gene from *C. perfringens*(accession No. in GenBank: KY559052.1)was modified and cloned into pET-22b expression vector, and the resultant plasmid was transformed into the competent *Escherichia coli*cells. The NetB toxoid expression in the recombinant *E. coli* was induced using the isopropyl-β-D-1-thiogalactopyranoside (IPTG), and the expression was confirmed by an indirect ELISA assay and western blotting. The NetBtoxoid was isolated from *E.* coli, purified and then used as the subunit vaccine. One-day-old broiler chickens were immunized subcutaneously with the recombinant NetB toxoid on days 3, 13, and 21, and then challenged with the virulent *C. perfringens* on day 30 for four consecutive days. Sera were collected from all birds after each immunization, and the anti-NetB antibody responses were determined using an ELISA assay. The body weights of birds were individually measured at 5 day intervals from day 24 to 34. The day after the challenge experiment, birds were euthanized and necropsied for further examination of the small intestine.

Results & Conclusion: The birds immunized with the recombinant NetB toxoid were significantly protected against the experimentally- induced necrotic enteritis, and also inducedstrong serum anti-NetB antibody responses to NetB protein. Furthermore, the immunized birds showed higher body weight gains during the challenge experiment compared with control birds.This study showed that the recombinant NetB toxoidfrom *C. perfringens* could be a protective vaccine candidate to protect broiler chickens against necrotic enteritis.

Keywords: *Clostridium perfringens*;*Escherichia coli*;Necrotic enteritis;Recombinant NetBtoxoid;Subunit vaccine

Conservation medicine of wild birds: A One Health approach

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Objectives: Many bird populations are exploited for human purposes. While the motivations and methods are varied, they share one consequence which is removal of birds from wild populations. In the recent decades, a number of high-profile outbreaks of new viruses and other pathogens was seen, many of them were emerging from wildlife. Outbreaks of SARS, Avian Influenza and others highlight emerging zoonotic diseases as one of the key threats to global health. Similar emerging diseases have been reported in wildlife populations, resulting in mass mortalities, population declines, and even extinctions. Migratory bird species harbor zoonotic pathogens of importance to humans. Migrations enhance the spread of pathogens and cross-species transmission. New research has also shown that migration allows hosts to escape from infected habitats, reduces disease levels when infected animals do not migrate successfully, and may lead to the evolution of less-virulent pathogens. Since 2003, millions of birds have died from avian influenza. WHO has reported that, since 2003, avian influenza has infected less than 1000 people worldwide, killing about half of them. Within weeks, economic anxiety, rather than pandemic death, rose to the top of the headlines. The main objective of this review is, therefore, to provide information that will assist wildlife and public health managers in developing mitigation strategies or approaches for dealing with outbreaks in wild birds.

Materials & Methods: This research is a review study in which articles published in authentic databases such as Scopus, ScienceDirect, Google Scholar and PubMed and also library search were used. The terms “Conservation Medicine”, “One Health”, “Wild bird” and “Zoonotic Disease” were used to search in English sources.

Results & Conclusion: Integrating human, domestic animal, and wildlife data could better assess the risk and devise methods of control. Mapping and surveillance of wild birds have improved the overall understanding of the role of migratory birds and the mode of transmission and emergence of new infections. This has enabled several countries to better target their disease control programs and move towards eradication. Strategic research in collaboration with the wildlife sector is needed to better understand the factors that contribute to inter-species pathogen transmission among all species. Resultant outbreak response plans and actions may represent meaningful steps of wildlife managers toward the use of collaborative One Health approaches when it comes to the detection, investigation, and mitigation of emerging viruses at the human-wildlife interface.

Keywords: Wildlife, Wild birds, One Health, Migration, Emerging zoonoses

Molecular detection of *Mycoplasma Gallisepticum*from a Chukar Partridge flockwith high mortality

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Objectives: Chronic respiratory disease, a common condition in poultry flocks, is primarily caused by *Mycoplasma gallisepticum*. It seems that the prevalence of mycoplasmosis has been increased in game bird populations which coincided with the semi-industrial production of these birds. We continuously encountered with MG infections in partridges and quail flocks during the recent years. Some of these field observationsnoted to take place in the early days of rearing period. One of these MG outbreaks in chukar partridgeswere described in this study.

Materials and methods:A 16 days-old chukarpartridge flockwith the history of respiratory clinical signs and rising mortality referred to Avian Diseases Research Center of Shiraz University.Flock size was 5500 birdswhich reared in alitter system.Primary clinical examinations showed respiratory signs includingconjunctivitis and infectious sinusitis of infraorbital sinuses. Also dehydration and low weight gain was prominent in referred birds.Postmortem examinations were carried out on the carcasses and due to necropsy findings, MG infection was suspected. For the confirmation of presumptive diagnosis, DNA extraction was performed from mucopurulent fluids ofinfectious sinuses and tracheal exudates and using specific primers, PCR were performed for identification of MG.

Results and discussion: There were low mortality up to the age of 12 days. Mortality increased exponentially between 13th - 18th days of rearing with daily peak of 1200 birds in the day 18. Total mortality of this flock reached to 65% at the age of one month.In necropsy examination, accumulation of caseous exudates in infra orbital sinus and trachea were constant features of necropsied birds.In addition, a large number of necropsied birds showed airsacculitisand hyperemia of the lungs accompanied with swollen and pale kidneys and urolithiasis. Molecular characterization of MGusing simple PCR reactions confirmed the presenceof MG. Prophylactic antibiotic therapy with lincospectin and tylosinand incomplete treatment withflorfenicol and enrofloxacin were done before visiting. At least, erythromycin was used from the day17 for 5 days. In addition, it was recommended to improve management factors specially drinking equipment to decrease kidney disorders.

Conclusion: Due to partridge sensitivity to natural MGinfections and in the absence of MG monitoring programs in game bird flocks, it is recommended to apply stricter principles of quarantine and biosecurity to prevent the transmission of this infectious agent to the other parts of poultry industry.

Key words:*Mycoplasma gallisepticum*,Chukar Partridge, PCR,

Evaluation of the effect of Alliacin on red mite (*Dermanyssus gallinae*) in laying hens

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Parasitic infections, whether internal or external, are one of the most damaging poultry diseases. Lice, fleas, ticks and mites are the most common external parasites in poultry industry. among them, *Dermanyssusgallinae*, which is better known as red mite due to its red color, is the most important ectoparasite of laying hens in Iran and many European countries.

Red mite control was usually based on organophosphates, carbamates, amidines, and pyrethroids. However, due to the increased resistance to these toxins, the number of toxins currently used is limited. The use of plant compounds is an alternative approach to controlling insects and mites, especially chickens red mite. In the present study, the effect of alliacin (a combination of alcoholic essential oils of garlic, onion and leek) and alcoholic essential oils of garlic, onion, leek and two-component compounds of garlic and onion essential oils, garlic and leek essential oils, onion and leek essential oils with concentration 1.5%, 3, 7.5, 15 and 30% and cypermethrin with concentrations of 1, 2 and 4 per thousand for 36 hours at different time intervals (2-4-6-8-10-12-24-26 hours) was examined on the chickens red mite.

The results showed that cypermethrin only at a concentration of 4 per thousand after 24 and 36 hours of exposure was able to kill 20.66 and 29.66% of mites, **sequential**. alliacin at a concentration of 30% was able to kill 86.66 and 96.66% of mites in 24 and 36 hours, **sequential**. Comparison of the results obtained from different groups showed that the best results were related to the two-component compounds of garlic and leek alcoholic essential oils and garlic and onion alcoholic essential oils at a concentration of 30%, in a period of 12 hours could be killed 95% and 86.66%, and eliminate 98.33 and 100% of red mites in 24 hours **sequential.**

Due to its poor efficacy and resistance to chemical toxins such as cypermethrin, alliacin and the two-component compounds of garlic, onion and leek essential oils can be used as alternatives, but according to the present study, only high concentrations of These substances had favorable effects on the elimination of poultry red mite, the use of these compounds in the industrial poultry farming is not cost-effective.

Prevalence of psittacine beak and feather disease (PBFD), in Chaharmahal and Bakhtiari Province using PCR

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Objectives: Psittacine beak and feather disease (PBFD) is the most common viral disease of wild and captive psittacine birds.As there is no treatment for affected birds, epidemiological studies and viral DNA diagnosis using PCR methods,are verycrucial. The purpose of this study was to determine the prevalence of PBFD in psittacine birds reffered to veterinary clinicks in Chaharmahal and Bakhtiari Province.

Material & Methods: DNA was extracted from feather samples, submittedto Royan PajoohKavosh Pouya Laboratory throughout Chaharmahal and Bakhtiari Province, from 113 psittacine birdsof 3 differnetgenra. These birds were tentatively diagnosed with clinical signs or a history of being in contact with PBFD-affected birds. Some samples were submitted to confirm absence of disease in quarantined birds.The presence of BFDV was analysed by performing polymerase chain reaction assays.

Result & conclusion: Twenty-eight (24.8%) samples were found to be positive for BFDV.Among positive samples, 13 were males and 15 were females. There was no significant predominance of one sex to be infected with PBFDV. High prevalence rate of this disease and having no treatment,indicate the importance of preventation strategies.

Keywords:PBFD, psittacine birds, PCR

Investigatin of Canarypox virus in bird flocks suffered frominfraorbital sinusitis and conjunctivitis

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Objectives: Canarypox virus (CNPV) is an Avipoxvirus and etiologic agent of canarypox, a disease of wild and captive canary birds that can cause significant losses. The aim of this study is to detect canary pox virus by polymerase chain reaction in canaries with sinusitis and conjunctivits clinical signs.

Material & Methods: DNA was extracted from orophryngeal swabs, submittedto Royan PajoohKavosh Pouya Laboratory throughout Chaharmahal and Bakhtiari Province, from 13canary flocks. These birds were tentatively diagnosed with clinical signs including conjuntivitisand sinusitis and respiratory distress.The presence of Canarypox virus was analysed by performing polymerase chain reaction assays.

Result & conclusion:five (38.5%) samples were found to be positive for canarypox virus.Among positive samples, 3 were males and 2 were females. There was no significant predominance of one sex to be infected with PBFDV. High prevalence rate of this disease and having no treatment,indicate the importance of vaccination and preventation strategies.

Keywords:CNPV, conjuntivitis, sinusitis, polymerase chain reaction

Comparative Effect of Dimethicone and Cypermethrin on Red mite (Dermanyssus gallinae) in Commercial laying hens

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Objective: Poultry meat and eggs are one of the most important sources of protein in the human diet, sochallenges that exist in poultry production and breeding are of great interest. Due to the fact that the length of breeding of laying hens is longer than the breeding of broiler chickens, the possibility of various diseases in this group of birds is also higher. Chicken red mite, (*Dermanisus gallinae*), is one of the main parasitic diseases of poultry farms, especially commercial laying hens all over the world. It has become one of the challenges rof veterinarians and poultry breeders.

Materials& Methods: In this study, the effect of Dimethicone with concentrations of 4%, 2%, 1%, 0.5%, and 0.25% on red mites in chickens, obtained from commercial laying hen farms, in the time intervals of 2, 4, 8,12, 24, 48, and 72 hours were investigated, and also the results were compared with Cypermethrin in concentrations of 1, 2 and 4 per thousand.

Results & Conclusion: The results in 24 hours period showed that Dimethicone in concentrations of 4, 2, ,1, and 0.5% and Cypermethrin in 0.004 were able toannihilate 100%, 97.77%, 18.88%, 16.66%, and 21.1% respectivelywhile no changes were observed in the other groups of dimethicone, cypermethrin, and distilled water. This study has shown that Dimethicone can cause the destruction of red mites in commercial laying hens andbe an effective and suitable alternative to the use ofchemical pesticides.

Keywords: Dimethicone, Cypermethrin, red mite (Dermanyssus gallinae), laying hens,poultry

A case report of hepatic cirrhosis in a cockatiel in Mashhad

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Objectives: Liver disease can occur in any avian species but is the most common in cockatiels, budgies, Amazon parrots, Lories, and mynah birds. The maincausesof liver disease include tumors, metabolic disorders, circulatory disturbances, nutritional deficiencies or excesses, and a wide variety of toxicities such as heavy metal toxicity, mycotoxins, plant toxins, and toxic chemicals. Cirrhosis is a late stage of scarring (fibrosis) of the liver and it can be caused by bacterial, fungal, viral, protozoan, and parasitic infections. The liver damage done by cirrhosis generally cannot be undone and often has no signs until liver damage is extensive. A healthy liver is critically important for the health of all avian species.

Material & Methods: A female cockatiel (*Nymphicus hollandicus*) without specific clinical signs, died. Therefore, it was essential to perform further investigations for diagnosis. History of the affected bird was taken. The carcass was subjected to necropsy. Gross lesions observed during the necropsy were limited to pulmonary and trachea hemorrhage, liver masses, and excess fat in the carcass. Tissue samples from the liver, spleen, lung, and brain were submitted to a pathology laboratory for pathological examinations.

Results & Conclusion: Findings were consistent with chronic liver disease characterized by distorted hepatic architecture and fibrosis. Although the cause of death was not determined in this case, in this study, we report the clinical pathologic, gross, and histopathologic findings in a cockatiel with hepatic cirrhosisin Mashhad, Iran.

Keywords: Cirrhosis, Chronic hepatitis, Cockatiel, Mashhad.

Effect of zinc oxide and lincomycin on necrotic enteritis in turkeys

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Objectives: The experiment was conducted to evaluate the efficacy of potentiated zinc oxide (PZO) as an alternative for Lincomycin antibiotic, to treat of subclinical necrotic enteritis (NE), in turkeys.

Materials & Methods: One hundred toms and 100 hens of B.U.T. Premium strain, were reared up from 7 to 9 weeks of age. At the same time environmental conditions for occurrence of experimental NE were provided. Zinc of their bodies was depleted since 10 to 12 weeks, by feeding zinc free mineral supplement. Then they showed signs of mild NE (including pale, weak, depressed, and drowsy turkeys with their heads down). At that time feeding therapeutic diets were performed since 13 to 15 weeks. The experiment was a completely randomized design and consisted of eight treatments, five replications and five birds per replicate. Treatments included: 1- Zinc-free ration as a basal diet; 2- Basal diet + lincomycin antibiotic; 3- Basal diet + 100ppm PZO; 4- Basal diet + 600ppm PZO. Each ration was considered separately for toms and hens.

Results & Conclusion: Results of orthogonal comparisons between treatments of PZO versus lincomycin antibiotic, showed no significant difference in terms of feed intake, daily weight gain, feed conversion ratio, fecal moisture, intestinal integrity index, carcass percentage, rank of intestinal NE lesions, osmotic pressure of intestinal epithelium and ratio of villi length to crypt depth in jejunum ($P>0.05$). Due to the fact that performance and intestinal health in turkeys receiving PZO were not significantly different with birds receiving antibiotics, and the odds ratio of intestinal lesions (rank 3rd in jejunum) for antibiotic treatments was 0.12 less than control treatments, and for PZO treatments was 0.33 less than control treatments, so it seems that PZO could be considered as an alternative to lincomycin antibiotic in this regard. However, at present this conclusion cannot be generalized to acute necrotic enteritis or other antibiotics effective in treat of necrotic enteritis and more research is needed in this area.

Keywords: Necrotic enteritis, antibiotic, potentiated zinc oxide, turkey

Effects of chitosan supplementation on the immune system and liver enzymes in Japanese quail

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Chitosan is a relatively new feed additive, which is of interest as a non-toxic polysaccharide with many biological functions. The aim of this research was to investigate the protective effects of chitosan on the immune system and liver enzymes in Japanese quails. The experimental period was 14-42 days. The experiment was conducted in the form of a completely random design using 100 quail chicks with 5 replications and 10 birds per replication. The experimental treatments included the control group and the control group supplemented with chitosan at the rate of 1 mg/kg of diet. The immune system of birds was evaluated using the sheep red blood cell (SRBC) suspension method. The results showed that chitosan supplementation caused a significant increase in the concentration of IgM and IgT in blood serum, compared to the control group ($P<0.05$). There was no significant difference in the concentration of IgG between the control and chitosan groups. There was no significant difference in the concentration of liver enzymes in the control group and the chitosan treatment group ($P>0.05$). Chitosan supplementation had no negative effect on the health of the liver and liver enzymes, alanine aminotransferase and aspartate aminotransferase. Therefore, chitosan can be used as a prebiotic substance to improve the immunity of Japanese quail chicks under conditions of oxidative stress, including contamination of diets with aflatoxin.

Keywords: chitosan,immune system,liver enzymes, quail.

Improving immune system ofjapanese quail by nano-chitosansupllementation

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This study was examined the effects of nanochitosan on the activity of liver enzymes and immune system in Japanese quail during the rearing period from 14 to 42 days. The experimental diets were includ the control group and the control group supplemented with nanochitosan in the amount of 1 gram per kilogram of diet. The experiment was conducted using 100 14-day-old Japanese quail chicks with 5 replicate and 10 birds in each replication. The immune system of birds was evaluated using the sheep red blood cell suspension (SRBC) method. The results showed that the concentration of liver enzymes was not affected by nanochitosan supplementation ($P>0.05$). Diet supplementationwith nanochitosanimproved the blood serum of IgM and IgT in the quail birds ($P<0.05$). Therefore, it can be concluded that nano-chitosan supplementation can be used to enhance the immune system in quail.

Keywords: antioxidant,enzyme,Japanese quail, nano-chitosan.

Histomoniasis in Peacock (Pavo cristatus) in Iran

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Histomoniasis is a disease caused by Histomonas meleagridis, a flagellated protozoan that can cause necrotizing hepatitis and severe typhoid in several bird species. This disease has a global distribution. In experimental infection, peacocks (Pavo spp.) Therefore, this report aims to describe the epidemiological and clinical pathology aspects of a case of histomoniasis in peacocks (Pavo cristatus) in the hot and humid region of Iran. An adult female peacock with no history of anorexia and anorexia, and depression died within two days. This animal was extensively farmed with basic hygiene measures and a history of living with 10 other peacocks. After a clinical examination in which severe anorexia and weight loss were confirmed, in the autopsy, severe diffuse bilateral necrotizing typhitis and multifocal necrotizing hepatitis were observed. The intestinal villi had been torned. black spots were seen on the liver. Severe dilatation of the intestines and hyperemia in the intestines were observed. Discussion: Clinical findings enabled the diagnosis and first registration of histomoniasis in peacocks in Iran. Initiated orally, the infection reaches the cecum through ingestion of H. meleagridis-infected nematode eggs that pass through the digestive tract and cause severe organ lesions, such as bilateral transmural typhoid. It has been observed in this case. From the cecum, the protozoan has access to the bloodstream and reaches the liver, where it causes necrotizing hepatitis, which is also present in peacocks. The challenge in diagnosing this disease is mainly due to non-specific clinical signs such as apathy and weight loss, the only breeder-reported symptoms observed in this peacock. Confirmation of the occurrence of histomoniasis in any locality to cause disease is important among the differential diagnoses for the species, as in this case. Since this is the first report of peacock histomoniasis in Iran, it shows the necessity of considering this disease among the possible diagnoses in non-specific symptoms and implementing control and prevention measures. In peacock breeding, to prevent bird losses and economic losses for breeders and promote animal welfare.

Keywords:Histomoniasis, Protozoa, first report, Pavo cristatus, Iran.

Effects of Nano-Selenium supplementation on broiler breeder male's fertility

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Objectives: It is well documented that aging has negative effects on fertility. With increasing age, antioxidant enzymes activity was reduced and because of rooster's sperm composition, the probability of sperm damage increases. The objective of the present study was to compare the effects of nano-selenium and sodium selenite on fertility factors in aged male broiler breeder chickens.

Materials & methods: Thirty five male broiler breeders (Cobb 500)® at 50 weeks of age were randomly divided into 5 equal groups. The control group was fed commercial diet, group T1 was fed commercial diet supplemented with sodium selenite (0.30 mg/Kg feed), group T2, T3 and T4 were fed commercial diet supplemented with nano-selenium (0.15, 0.30 and 0.60 mg/ Kg feed, respectively). Sperm characteristics (sperm count, motility, viability, the percentage of sperm with intact double-stranded DNA and maturity), testicular histomorphometric features (tubule differentiation index (TDI), spermiation index (SPI), Sertoli cell index (SCI), miotic index (MI), diameter of seminiferous tubules and interstitial space were assessed.

Results & conclusion: The results showed that sperm characteristics were gradually decreased with age in control group but in groups received selenium sodium and nano-selenium, compared to the control group, the results were improved and the best results were found in T3 group. As well as, comparison of tubule differentiation index, spermiation index, Sertoli cell index and mitotic index in different groups showed a relative improvement in the groups received sodium selenite and nano selenium compared to the control group and the group received nano selenium 0.3 mg / kg diet Food (T3 group) showed the best results. Investigating the diameter of seminiferous tubules and interstitial space, shown that the diameter of the seminiferous tubules in group T3 was higher than other groups but the diameter of the interstitial space was lower, but the difference was not significant.In conclusion, our findings revealed that dietary supplementations with nano-selenium boost studied fertility factors in aged male broiler breeders and the best results were obtained when the roosters received 0.30 mg/Kg nano-selenium. Supplementation of nano-selenium in aged male broiler breeders may be effective to maintain and/or increase the fertility.

Keywords: Nano-selenium, Broiler breeder male,Fertility,Sperm,Histology,Morphometry

The Effect of Heat Stress caused by Improper Ventilation on the Commercial Laying Flock: A case report

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Abstract:This paper refers to a commercial laying farm that was located in the pleasant climate area of Qom provincein Iran and suffered from heat stress in the summerwhile poultry farm management was not prepared for unprecedented heat stress.Poultry farmers faced an increase in losses in the flock with a capacity of 10,000 laying hens 10, 40, 100 pieces of casualties for three consecutive days. This sudden trend of increasing casualties worried the poultry farmer.On the second day, only the carcasses were referred to the poultry clinic. No gross pathological finding were seen in the carcasses.On the third day, when the losses had reached 100 pieces, the Commercial Laying farm was visited. Egg production, quality of egg production, amount of food consumption had not changedbut amount of water consumption had increased.The flock was cheerful but some were panting. The farm visit at 17:00 on the hottest summer days.The layers of all corridors and all floors were clinically examined.The temperature of the hall at that time was 29 to 31 degrees Celsiusin different parts.The air circulation of the hall was not uniform and optimal in all places, the air circulation was weak in an angle of the hall. Mostof the casualties occurred at nightbut the first worker that was new,did not know exactly where the casualties were caused. He said that there are casualties everywhere of the hallbut with a more detailed history taking from another worker, it was determined that there were casualties in the upper floors and the corridor with unfavorable air circulation.Farmer was guided to reduce the temperature to a maximum of 25 degrees Celsius and better air circulation by installing a fan in an angle where there was no air circulation and air outlet was needed.Vitamin C and aspirin were also prescribed to improve heat stress tolerance. The day after the implementation of the prescription, there were zero casualties.This paper are describes the initial days of heat stress inthe sudden changes in the climate of the poultry farm such asaccuracy in history taking, no decrease in egg production, no production of shellless eggs, no decrease in food consumption, the effect of temperature at different heights of producing cages in the hall and poor ventilation in inside the hall.

Key words: Heat stress, Commercial layers, Poor ventilation.

Investigating Pcitacianbeak and feather disease (PBFD) in clinical samples of Alborz province by RT-PCR

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Objectives: The purpose of this study is investigation PBFD in parrots that referred to Chenica and Karaj clinics.

Materials & Methods: Parrots are one of the most popular birds to keep. On the other hand, a wide range of diseases and pathogens also threaten their health. One of the most important factors is beak and feather viral disease (BFDV), which can be observed clinically or latently in birds. For this purpose, in this research feather samples were taken from 433 captive birds that were referred to Chenica and Karaj clinics and tested by Realtime PCR method with TaqMan probe in Mabna Laboratory. Out of 433 sampled parrots, 216 (41.7%) were infected with beak and feather disease virus and 217 samples (58.3%) were healthy.

Results & Conclusion: The results of this study showed the infection rate among the studied species, cockatiel have the highest rate of involvement with this virus (61.9%) and cockatoos (2.3%) were infected as the lowest rate of infection with beak disease. In the investigations conducted on the method of sampling in the diagnosis of beak and feather viral disease, the feathers can be used as a suitable source for the diagnosis of the disease only in birds with clinical symptoms.

Keywords: PBFD, Pcitacian, RT_PCR, Clinical samples, Karj

Development and laboratory scale production of inactivated Newcastle disease vaccine

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Objectives: As one of the most important factors threatening the poultry industry, viral infections are of vital importance because they are highly contagious. For example, Newcastle disease (ND) is a viral infection with a global distribution. Various strategies are used for preventing and control of poultry diseases, including vaccination. Vaccines are a crucial component of poultry disease control throughout the world. This study aimed to design and experimentally produce an inactivated ND vaccine.

Materials & Methods: In this research, we designed an inactive ND vaccine and produced it at the lab scale. We then evaluated its immunization potential in SPF chickens. To produce the vaccine, the Standard strain of ND V4 was replicated in embryonated eggs. After titration, the virus suspension was inactivated. After performing the standard control tests, different amounts of the virus were considered a dose and introduced as the vaccine. The developed vaccine and a similar imported vaccine were injected into different groups of SPF chickens, and the hemagglutination inhibition (HI) test was performed on serum samples.

Results & Conclusion: The virus was multiplied in embryonated eggs and the result of titration was calculated as 10^9 EID 50/mL for the Newcastle disease virus (NDV).Evaluation of inactivation showed no sign of the presence of viruses at the end of three passages of SPF eggs.The results of the HI test showed that the titer of the anti-NDVhad an increasing trend up to the end of the test and was calculated as 7.4 in the fourth week after ND vaccination. Given the prevalence of poultry diseases and the expansion of the poultry industry, it is necessary to establish disease diagnosis units and prepare poultry vaccines. In this study, the produced inactivated vaccine was injected into 5week-old chickens, and the results showed the proper uniformity of specific antibodies in the birds. The HI titer for the imported vaccine was obtained at 7.9. There was no significant difference in the titers of anti-NDV antigen between the developed and the imported vaccines.In this study we developed an inactive ND vaccine to achieve herd immunity. The titer of the specific antigen in SPF chickens showed the potential of this vaccine for stimulation and induction of immune responses and an appropriate formulation.Selection of an appropriate vaccine, precise execution of vaccination, and timely use of killed vaccines are some issues that should be considered in the poultry industry.

Keywords: Newcastle disease virus(NDV),Newcastle disease (ND),Vaccine,Inactivated,SPF chickens

Relieving of Hypoxia-Induced Pulmonary Hypertension Using a Novel Therapeutic Premix (Hypoxi Relief®) in ArainBroiler Chickens

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Objective: The main strategy to get rid of pulmonary artery hypertension in broiler chickens is to genetically improve cardiovascular and respiration capacity. But where the oxygenation capacity of hemoglobin is reduced, pharmacological strategies and the use of metabolites effective in reducing hypoxia without slowing the bird's growth rate will compensate. The aim of this study was to evaluate the effectiveness of Hypoxi Relief® premix (containing nitric oxide precursors and endothelium protective substances) on Arian domestic commercial broilers strain (which is susceptible to hypoxia) and modern broiler resistance to pulmonary hypertension (Ross 308).

Materials & Methods: Three hundred forty-eight, one-day-old Arian commercial strain (114 male and 114 female) chicks and Ross 308 (60 male and 60 female) in a four-floor battery cage in an area with analtitude of 1,340 m above sea level were reared for 42 days. At 28 days of age, broilers were grouped in to four treatments. Controls (Arian and Ross) were fed with basal diet and two other treatment groups (Arian+HR and Ross+HR) were supplemented with HR premix (1 kg/1000 kg feed). Body weight, feed intake per cage were measured at week-6. Feed conversion ratioand mean weekly weight gain and daily weight gain were calculated. At 42 days of age, blood samples were collected from the wing veins of three birds in each cage and collected in micro hematocrit tubes were centrifuged at 13000 rpm for 5 minutes. Then the percentage of hematocrit was measured using a micro-hematocrit reader (Behdad, Labtron CO). Plasma nitric oxide (NO) concentration was measured by reducing of nitrite to nitrate by vanadium chloride, followed by quantification of nitrite by Griess reaction using a commercial nitric oxide kit (ZellBio®, made in Germany) according to the manufacturer's instructions. After preparing the samples in a 96-well plate, the color intensity of the samples was read at a wavelength of 540 nm using an ELISA device. Calibration curve was drawn by plotting absorbance values against nitrite and nitrateconcentrations (µmol) as nitric oxide metabolites.

Results & Conclusion: Average daily gain of Arian+HR significantly increased compared to Arain Control group. Feed conversion ratio (week 6) of Ross+HR significantly improved compared to Arain Control. Blood hematocrit (index of blood viscosity) significantly reduced in Ross+HR.Plasma NO of Ross+HR significantly increased compared to Arain Control.Obtained results showed significant improvement in physiological and growth performance of 42 days old broiler chickens, received HypoxiRelief in the feed.

Keywords: Hypoxia, Ascites, Nitric Oxide, Arian, Hematocrit

The Effect of Different Levels of Dietary Metabolizable Energy and Copper-Methionine Supplement on Internal Organ Weights of Broilers

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Objectives: The aim of the present study was to evaluate the effect of different levels of dietary metabolizable energy and copper-methionine supplement on internal organ weights of broilers. The major portion of poultry feed is used for energy production to provide the maintenance and growth requirements. The increasing of dietary metabolizable energy decreases feed consumption and improves body weight gain and feed conversion ratio of broilers. The raising of dietary metabolizable energy is mainly done via addition of oils and fats. The dietary oil and fat sources may be oxidized and need to the presence of antioxidants for prevention of oxidation. Peroxidation of liver fats may disturb antioxidant defense mechanisms of hens, cause oxidative damage and make the liver prone to bleeding. Copper is a part of superoxide dismutase enzyme. Superoxide dismutase neutralizes free radicals. Therefore copper has antioxidant property and can protect internal organs such as heart, liver and pancreas from oxidative damage.

Materials & Methods: A total of 576 one-day old Ross 308 male broiler chicks were allotted in a 3×4 factorial arrangement with completely randomized design to 12 treatments and 4 replicates of 12 chicks in each. The factors of interest included different levels of dietary metabolizable energy (at Ross catalogue recommendation (3025 kcal/kg), 100 kcal lower than that of Ross catalogue recommendation (2925 kcal/kg) and 100 kcal higher than that of Ross catalogue recommendation (3125 kcal/kg)) and different levels of dietary copper-methionine supplement (0, 150, 300 and 450 mg/kg). The diets were formulated according to Ross 308 catalogue recommendations. The lighting program included 23 hours lightness and 1 hour darkness. Feed and water were provided *ad libitum* throughout the experimental period. At 49 day of age, one bird with body weight nearest to average body weight of the experimental unit was selected and slaughtered after weighing and internal organ weights including heart, liver, gallbladder and pancreas were measured. The data were analyzed using the GLM procedure of SAS. Comparison of means was conducted by Duncan's multiple range test.

Results & Conclusion: The results of this experiment showed that the effect of different levels of metabolizable energy and copper-methionine supplement and experimental treatments was not significant on none of the internal organ weights (P>0.05). Based on the results of the resent study, it seems that the increasing of metabolizable energy level and addition of copper-methionine supplement to the diet can not improve internal organ weights of broilers.

Keywords: Metabolizable energy, copper, methionine, internal organs, broilers

The detection of *mcr*-1 gene in *Escherichia coli* strains isolated from chicken meat

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Objectives:Colistin (polymyxin E) is a polymyxin antibiotic produced by the soil bacterium Bacillus polymyxa. It was approved in the late 1950s for the treatment of acute and chronic infections caused by certain sensitive strains of Gram-negative bacteria.Colistin is prescribed for the treatment of UTI and has been associated with many cases of resistance worldwide. The *mcr*-1can make bacteria resistant to colistin. The renewed attention has been paid to the *mcr*-1 gene because it has been detected not only in clinical isolates but also in animal, food, and environmental samples.

Materials & Methods: In this study 100 chicken meat samples were prepared and after bacteriological examination the *Escherichiacoli*(*E. coli*) strains were identified. All of strains were approved with biochemical tests (IMVIC test). The colonies were selected and cultured on Muller Hinton agar for antimicrobial susceptibility. The conventional antibiogram discs were utilized according to disc diffusion test protocol. Then, the DNA was extracted from colonies with boiling method. The extracted genome was used for amplification of *mcr*-1 gene with specific primers.

Results & Conclusion: The results revealed that 22% of chicken meats contaminated with *E. coli*strains. The most of *E. coli*strains were resistance to Enrofloxacin, and Oxytetracycline (36.36% vs 45.45%). The *E. coli* strains were revealed 18.18% resistance against colistin. The *mcr*-1 gene was detected in 75% of colistin resistance *E. coli* strains. The research manifestedchicken meat is a potential reservoir of *E. coli* strains harboring *mcr*-1resistancegene.

Keywords: Antimicrobial resistance, Chicken meat, Colistin, *Escherichia coli*, *mcr*-1 gene.

Investigation of Antibiotic Resistance Patterns of *Escherichia coli*Strains in Broiler Chicks with ColibacillosisSigns in Isfahan Province, Iran

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Objective: Antibiotic resistance of *E. coli* is currently a great health challenge in poultry industries. The aim of this study is to investigate the resistance pattern of *E. coli* strains isolated from broiler chick farms in Isfahan province, Iran.

Material and methods: Broiler chicks' carcasses with clinical signs of colibacillosiswere collected from 60 flocks. *E. coli* was isolated and antibiogramwas done by standard bacteriological method.

Results &Colclusion: From 60 isolated *E. coli* the antibiotic resistance patterns were as follows in percent:tylosin (93.3), tiamulin (91.6), doxycycline (60.6), danofloxacin(53.3), erythromycin (80), difloxacin (63.3), fosbac (16.6), cefixime(36.6), colistin(25), flumequine(50), chlortetracycline (53.3), florfenicol(38.3), lincospectin(25), enrofloxacin(36.6), sulfamethoxazole-trimethoprim (51.6) respectively. The results of this study show the higher rate of antibiotic resistance of *E. coli* detected from broilers in Isfahan and it is of greatimportance for public health in human nutrition and poultry medicine biosecurity.

Keywords: antibiotic, resistance, *E. coli*, broiler, Isfahan.

Detection and molecular characterization of field strains of Infectious Laryngotracheitis Virus in broiler flocks and backyard chickens in Iran

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Objectives: Infectious laryngotracheitis (ILT) is a highly contagious, infectious respiratory disease that is caused by Gallid Herpesvirus-1 (GaHV-1, namely ILTV) mainly affecting pullets and laying hens. The disease has not been reported in broilers and backyard chicken in Iran, previously.

Materials &Methods: The present study aimed to identify ILTV strains in outbreaks with severe respiratory clinical signs that occurred in Semnan province (Iran) in broiler farms and backyard chicken farms during June 2019 and March 2020. For this purpose, specimens were investigated from twenty-eight broiler farms with severe respiratory symptoms and a mortality rate of 5.5-29% and 2 backyard flocks.

Results & Conclusion: The presence of ILTV was assessed by histopathology, conventional PCR targeting of ICP4 gene fragment, and sequencing analysis.Comparison of detected genotypes with strains from Iran and neighboring countries demonstrated the high homology of detected isolated with field strains from Turkey.

Keywords: Backyard chicken ,Broiler, ICP4 gene sequencing, Infectious laryngotracheitis

Semilunar valves of theChukar Partridge heart: A developmental study

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Objectives: This research was conducted to study the developmentof the semilunar valves of the heartin thechukar partridge (Alectorischukar) embryo.

Materials & Methods: For this study60embryonated eggs were provided and placed in the incubator. From day 5th collection and tissue sampling of the embryo's heart started. The specimens were fixed in formalin buffer solution and put in the tissue processor apparatus. Then the samples were blocked and sectioned by microtome to 5 micron sections. Finally the slides were stained with Hematoxylin-Eosin (H&E) andAlcian Blue (AB). The formation and histogenesisof the semilunar valves during this period were studied by light microscope and photographs were taken by a digital camera mounted on the microscope.

Results & Conclusion: The thickenings and growth of the four endocardial cushions is the principle cause of the semilunar valves formation. The four cushionsare anterior, posterior, and two lateral thickenings. A septum begins to form between the future ascending aorta and pulmonary tract which results in splitting the two lateral thickenings, so that the ascending aorta and pulmonary trunk have three thickenings each. The three cusps of the semilunar valves of the pulmonary and aortic, originate from these three thickenings. From the first day of this study (5th day of incubation period), the endocardial cushions were seen as small thickenings with cardiac jelly. By the 8th day of incubation period, the single outflow tract was completely split into aortic and pulmonary trunk and the three cusps of semilunar valveswere clearly seen resembling the benz logo shape. At the day 10, the channels and connections between Aortic and Pulmonary artery were being removed by the apoptosis process in a way that they completely disappeared from 11th day of incubation period.

Keywords: Chukar partridge, semilunar valves, heart, Histogenesis, Development

The Ureterhistogenesisin the Chukar Partridge

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Objectives: This study was performed to clear the histogenesisand development of the ureterin thechukar partridge (Alectorischukar) embryo.

Materials & Methods: For this purpose 40embryonated eggs were used for incubation. The embryos were collected from day 5 to the end of incubation period.The specimens were fixed in formalin buffer solution and the commontissue processing was performed. Finally the slides were stained with Hematoxylin-Eosin (H&E), Alcian Blue (AB), Periodic Acid Schiff (PAS)and Masson trichrome (MT). The developmental and histogeneticchanges of the ureter during the incubation period were studied by light microscope and photographs were taken by a digital camera.

Results & Conclusion: The developmental and histological characteristic ofthe ureteric duct was studied from day 5 to 24 of the embryonic period in the chukar partridge. In the early stages, a small metanephric duct was seen near each metanephric kidney. The wall of this duct was consisted of pseudostratified columnar epithelium and mesenchymal connective tissue. At the day 13th of incubation, the epithelium was thickened and two layers were distinctive in the surrounding connective tissue as inner compact and outer less compact layers. By the day 16th, the lumen of the ureteric duct was observed in star shape. From this day until the end of the incubation period, development of the muscular layers, the inner longitudinal muscle layer and the outer circular muscle layer, was in progress. The results of the present study showed that the basic histogenesis features of the ureter of the chukar partridge were similar to the once of other domestic birds like chick, but the time of the appearance of the structures and the developmental stages of this organ were seen with delay and in older stages of incubation, comparing to the chicken ureter.

Keywords: Chukar partridge, ureter, metanephric duct, Histogenesis, Development

Isolation of *Candida glabrata* and other oppurtunistic fungi from pet bird droppings

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Objectives: The purpose of this study was to determinethe prevalence of pathogenic fungi in the environment of keeping these types of pets, knowing the prevalence of these types of fungi with the possibility of being dangerous for humans, looking for a way to reduce the risks of coexistence between humans and birds.

Materials & Methods: : 126 samples were collected from 3 groups of birds (psittacines, Passerines, and Columbiformes) referred to the specialized bird clinic of Tehran University's Faculty of Veterinary Medicine. Lactophenol-cotton-blue, saborodextrose agar and chrom agar were used to identify different types of yeasts and fungi.

Results & Conclusion:The most common sample is related to the cockatiel with 46%, love bird 16%, African grey parrot 10%, Rose-ringed parakeet 6%, alexandre parakeet5% and Commonmynah, Green-cheeked parakeet, Domestic canary, cockatoo and white king pigeon less than 5%. 66% of the samples were positive, of which 72% filamentous fungi and 38% yeast were identified. Among filaments, 65% of the cases were Aspergillus with abundance of *Aspergillus flavus* and the rest were *Mucor* and *Penicillium*, and 36% of mold cases were *Candida albicans* and 6% were *Cryptococcus neoformans* and 3% were *candida glabrata* and the remaining cases of other types of candidates, *Rhodotrula* and 21% were unidentifiable with the existing culture media.Considering the isolation of fungi and molds with the possibility of being pathogenic for humans, the importance of this research is more. In this study, 1 case of *Candida glabrata* was isolated. This yeast is known as a fungus resistant to azoles and its transmission from the environment and food to humans has been reported. as a result, investigating and finding health solutions for this issue will be of particular importance.

Keywords: *Candida glabrata*, oppurtunistic fungi, *Candida albicans*, psittacines

Syngamus Infection in Threechickens in Gilan, north of Iran

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Objectives: The gapeworms are considered potentially dangerous, especially for backyard, game-birds and free-living birds, while the control of the disease is complicated.In this case report, we found Syngamus and then we were able to save sick chickens from severesyngamusis.

Materials & Methods: Sick 1-Years-old chicken was presented to the unit of Avian Medicine, Faculty ofVeterinary Medicine, University of Tehran, Iran. The birds were reared at a specially constructed house which covered 10 m2 of the ground, including self-growing flora, in the region of Foman, in the countryside of Gilan. Thefarm consisted of 7 chickens. severe respiratory distress was observed from 3 of 7 chickens, During the clinical examination one of them had anemic combs and wattles and breathing with open beaks and had their necks stretched. faecal sampleswere collected from the chicken that had severe symptoms for parasitological examination. A sedimentation method was used and eggs of S. trachea were found.Syngamosis was determined to be the cause of the severe respiratory distress.

Results & Conclusion: We also found thatS. trachea is more pathogenic to local chickenscompared to other birds especially in the north of Iran.The mostpossible explanation for thiscase of syngamosis was the age of the final host, sinceyounger birds seem to be extremelysusceptible, while adult birds show higherresistance and may only be carriers.The susceptibility of the younger birdsis the reason why syngamosis is associated with thebreeding cycles in the spring to summer months forfree-ranging birds. This case of syngamosis was treated with levamisole given once, at the dose referred above, and repeated after 10 days.

Keywords: Syngamosis, Syngamus trachea, Chicken, Case report, Pathology

Salmonella: poultrylean meator meatwith skin?

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Objectives: Some microorganisms such as Salmonella, Listeriaand Campylobacter cause food borne diseases in human, which some control and food safety measures are not able to prevent. However, it is necessary todevise new systems for achieving this target. The purpose of this study was to determine Salmonella contamination through cross contamination of meat inslaughtering premises.

Materials & Methods: Forthisstudy, atotalof 50samples were taken from slaughter houses and transported to the laboratory of food hygiene where they were divided to 2groups; the first group consists of leanmeat, while the other group consists of meatwith skin. Each sample (25 g) was prepared according toStandard methods of Institute of standards and Industrial Research of Iran.The McNemartest for qualitative data was used to compare the two groups.

Results & Conclusion: Accordingtotheresultsobtainedfromthe2groups; 17 samples from first groupand

10 samples from second group(meatwithskin)were positive.A comparison of these two group showed as ignificant difference ($p<0.05$).There sults show that the rate of cross contamination with salmonellosis inslaughter houses was high and it proves that they should be omitted by properly skinning and cookingthe contaminant. The sehigh levels of microbial contamination and occurrence of pathogenic bacteria reflect the poor hygienic quality of poultrymeat under these conditions.

Keywords: Salmonella, poultry meat,skin,infection.

The effect of *melatonin* on the heart of Broiler Chickens with Ascites Syndrome (Enzyme study)

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Objectives: Pulmonary hypertension syndrome (PHS) refers to the accumulationof non-inflammatory hepatic transudate in the peritoneal cavity of the broiler chicken. It is a global threat for the broiler industry which progresses through wide ranges of physiological and metabolic changes.Melatonin (ML) is one of the important hormones that prevent metabolic and physiological disorders in poultry but does not attract attention by poultry scientist. ML regulates the brain's biological clock, acts on respiration, circulation, excretion, reproduction and immunity system. It also provides elimination of free radicals in the body. ML stimulates growth hormone secretion and, thus, effects growth performance of poultry positively.

Materials & Methods:A total of 72 one-day-old Ross 308 broilers were purchased and divided into 2 groups of 36 birdsIncluding control and melatonin (20mg/kg) of diet,Chickens were raised from 1 to 42 days old under standard conditions on litter. The temperature on the first day was 33 degrees. In order to induce ascites, the temperature was gradually reduced. At the end of the period (42 days), the birds were slaughtered in order to obtain heart samples.Activity of Superoxide dismutaseenzyme (SOD) was measured by the method of Sun (Sun et al., 1988).

Results & Conclusion: The results indicated a significant difference between the control group (13.99±0.581) and the melatonin group (17.62±0.648) (P = <0.001). These results show that melatonin can have a positive effect on the antioxidant system and reduce ascites in broiler chickens.

Keywords: Melatonin, Ascites, Chickens, SOD enzyme

Prevalence of Cryptosporidium Infection among Backyard Poultry in Bushehr Province

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Objectives: Cryptosporidium is a protozoa andone of the most common enteric parasites. Ithas many host species such as mammals, birds, fish and reptiles.It is thought thatbirds are reservoir for humaninfections due to the possible transmission.

The occurrence of *Cryptosporidium* spp. among avian hosts hasn't been extensively investigated, therefore the aim of this study was to determine the prevalence of *Cryptosporidium* infection among backyard poultry in Bushehr province.

Materials & Methods:1200blood samples (from birds'wing) were collected from 30 villages in Bushehr provincefromJanuarytoJune2021.Centrifuging blood, serum was separated.Presence of *Cryptosporidium* antibodies were evaluated by ELISA kit (BioSource Co., Ltd., USA) accordingtothemanufacturer'sinstruction.

Results & Conclusion:56 samples (4.66%) were positive by ELISA which shows the existence of *Cryptosporidium* infection in backyard poultryin Bushehr Province. This finding can be concerned in performing proper surveillance program, prevention and control of cryptosporidium. Of course, more studies are required.

Key words: Cryptosporidium, Backyard Poultry, Bushehr Province

Seroprevalence of Newcastle Disease and Avian Influenza (H9N2) Viruses in the Unvaccinated Backyard Poultry in Bushehr province, South of Iran, 2021-2022

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Objective: Newcastle Diseaseand Avian Influenza (H9N2) are the most important and main contagious poultry diseases which can cause extensive economic losses to the poultry industry.Rural and backyard poultry breeding is the prevalent form of poultry production in the developing countries.

Determining specific antibodies to NDV and AIV (H9N2) in the serum of birds in backyard flock helps experts to monitor ND or AI in non-industrial poultry flocks and will be useful forto perform proper surveillance program and designing national and regional poultry health policies, so this study was done.

Materials &Methods:1800 blood samples were collected from unvaccinated backyard chickens in Bushehr province, during 2021-2022. Serum was separated andthe haemagglutination inhibition (HI) test was used for the detection of the presence of the antibodies against NDV and AIV (H9N2) according to The Office International Epizooties (OIE) Manual.

Results& Conclusion: The overall seroprevalence rate of NDV antibodies was 43.61% (785/1800) and average HI titer was 6.09. The highest prevalence (59.40%) and HI titer (6.23) for NDV occurred in Dashtestan. Also, the antibody (mean) seroprevalence and titer of AIV (H 9N2) were recorded 40.7% and 5.91, respectively.

According to these findings NDV and AIV (H9N2) are endemic and widely circulating in the Busheher provincial backyard chickens which can be a potential risk windows for introduction to industrial poultry farms resulting in economic impacts.

It is therefore so important that further detailed studies focus on NDV and AIV (H9N2) strains identification so that preventive and control programs particularly with emphasis to start vaccination (ring vaccination) in this area can be performed.

Keyword: Newcastle disease, H9N2, Iran, Backyard chicken

Antibiotic resistance of Escherichia coli isolated from broiler chicken flocks to tylosin, erythromycin and oxytetracycline in Kermanshah province

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Objectives: Escherichia coli is a member of the Enterobacteriaceae family, which causes various diseases in poultry. In recent years, due to the widespread use of antibiotics, bacterial infections resistant to antibiotics have increased worryingly, which is very important considering the nutritional and economic value of poultry meat.

Materials & Methods: During the period of 6 months, a total of 180 samples were collected from the meat poultry flocks of Kermanshah province. Microbial tests were performed to identify Escherichia coli, as well as antibiogram testing of the resulting isolates.

Results & Conclusion: The results showed that out of 180 samples, the contamination of monitored poultry flocks with Escherichia coli was more than 70%.The results of antibiotic resistance showed that antibiotic resistance to tiamulin, erythromycin and oxytetracycline were 76, 15 and 8.3% respectively.The results of antibiotic resistance showed that antibiotic resistance to tiamulin, erythromycin and oxytetracycline were 76, 15 and 8.3% respectively.

Excessive use of antibiotics in broiler chicken flocks has led to an increase in resistance to antibiotics. In order to prevent the emergence of antibiotic resistance, it is necessary to avoid its excessive and unnecessary use. Observance of hygiene principles in poultry flocks and use of appropriate management methods can be very helpful.

Keywords: Antibiotic resistance, Escherichia coli, broiler chicken flocks

The effect of storage time on the chemical and microbial quality of broiler feed

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Objectives: Broiler farms buying feed in one or two parts and storing it in a warehouse during the entire breeding period and using it on a daily basis. This is done in order to comply with biosecurity principles. Purchases can be made even days before hatching. In this study, the effects of storage time on feed's chemical and microbial quality were examined to suggest the best storage time of food for broiler breeders.

Materials & Methods: In order to conduct this research, the pellet feeds purchased from the warehouse were stored without opening and changing in five different parts of the warehouse. The storage period was 0, 10, and 20 days, and in each time period, three samples were taken from each part of the warehouse. The Near-infrared spectroscopy (NIR) device was used to check the chemical quality (moisture, protein, behavior, fiber, and ash). Samples (total microbial count, mold, and yeast) were cultured on the selected medium by the pour plate method and numbered after the greenhouse. The data were analyzed in the form of a completely random design in 3 treatments (time intervals) and 15 repetitions using SPSS software (Version 22).

Results & Conclusion: The results of this study indicate that there was no significant difference between experimental treatments regarding the quality of chemical results. There was a significant difference ($P<0.05$) between experimental treatments regarding microbial quality. There were a correlation between increasing storage time and increasing the microbial count. It can be concluded that storage time can significantly affect the microbial quality of feed. It is suggested that breeders buy feed in fresh and smaller quantities to keep storage time short.

Keywords: Broiler, Chemical, Feed, Microbial, Quality, Warehouse

The effect of drought on chemical quality and moisture content of the final product of the animal and poultry feed factory in Fars province

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Objectives: One of the effective quality parameters in the livestock and poultry feed production industry is the moisture control of products, which is directly related to the weather conditions. In the production process, the feed is cooled using the ambient airflow after being pelletized in a cooler. This process can affect the moisture and quality of products. During the last few years, some factors such as drought, the decrease in rainfall, shortening of the winter season period, and the decrease in air humidity can play pivotal role in the control of humidity. The purpose of this study is to investigate the effect of changes in weather conditions on the chemical quality and moisture content of the feed.

Materials & Methods: Samples were taken from the final product of a type of feed production (broiler chicken) after processing in the cooler system. Near-infrared spectroscopy (NIR) device was used to evaluate the chemical quality (moisture, protein, fat, fiber, and ash) of product. The data were analyzed in the form of a completely randomized design in 4 treatments (4 seasons of a year) and 40 replications using SPSS software (Version 22).

Results & Conclusion: The results of this study showed that there is no significant difference between experimental treatments in terms of chemical quality. There was a significant difference between the winter season and the rest of the seasons (spring, summer and autumn) in the moisture level of the product ($P<0.05$). The moisture content of the product in the winter season increased by only 0.8% due to weather conditions. Since this slight difference cannot have a special effect on the quality of feed. It can be concluded that in the conditions of drought in Iran, the production and storage of feed in the livestock and poultry feed factory can be associated with the least possible contamination.

Keywords: Drought, Factory, Feed, Humidity, Quality

Investigation of susceptibility of Escherichia coli to different antibiotics in industrial poultry of Chaharmahal and Bakhtiari province

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Objectives: The aimof this study was to investigate the antibiotic susceptibility of Escherichia coli in referred samples ofindustrial poultry in Chaharmahal and Bakhtiari province.

Materials & Methods: The present study includes cases from industrial poultry flocks referred to the veterinary clinic of veterinary faculty of Shahrekord University, during the years 2019 to 2022with clinical signs of septicemia. After performing the necropsy, for bacterial isolation and antibiogram testing, samples were obtained from pericardial effusion or from the blood, under aseptic and sterility circumstances,in culture media containing petri dishes. Escherichia coli colonies were isolated, verified and cultured on distinctive dishes, and antibiogram testing was carried out by disk diffusion method.

Results & Conclusion: The results were categorizedas sensitive and resistant, based on the given reference of the discs. The values related to intermediate susceptibility were not measured and not stated in these results. Average percentages are mentionedas percentages of sensitivity and resistance for each antibiotic, respectively: Doxycycline9.6 % sensitive and 77.25 % resistant, Difloxacin2.5 % and 95.8 %, Danofloxacin5.5 % and 85.5 %, Erythromycin0 % and 97 %, Enrofloxacin3 % and 93 %, Florfenicol18.5 % and 65.5 %, Flumequin5.5 % and 94 %, Fosfomycin (Fosbac)55 % and 45 %, Lincospectin30.2 % and 56.2 %, Sultrim (Sulfamethoxazole + Trimethoprim)18.4 % and 79.9 %and Oxytetracycline3.6 % and 93 %. The minimum and maximum percentages of antibiotic resistance were related to Fosfomycin and Erythromycin, respectively. Surprisingly, none of the samples were sensitive to Erythromycin antibiotic. The highest sensitivity percentages were related to theFosfomycin,Lincospectin,Sultrimand Florfenicolantibiotics.Finally, we can conclude that resistance to common antibiotics is high in Chaharmahal and Bakhtiariprovince and due to the high antibiotic resistance, treatment of the diseases like colisepticemia should be based on the preciseresults of antibiotic susceptibility testing of the samples with common methods like disk diffusion.

Keywords: Antibiotics, Antibiogram testing, Disc Diffusion, Escherichia coli, Industrial poultry

The effect of body weight changes on sperm quality of Arian broiler grandparent roosters

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Objectives: The current study aimed to assessthe effect of body weight changes on sperm quality of Arian broiler grandparent roosters.

Materials & Methods: In this experiment, 20 adult roosters of line A (50 weeks of age; with wing tagged)with similarbody weight (4750 ± 100 kg) were used for 8 weeks.The experiment was carried out on floor.During the first two weeks, the roosters were accustomed to new conditions and semen collection by abdominal massage method.At 52-58 weeks of age, the roosters wereindividually weighed and ejaculates obtained fromeach rooster were collected to elevated semen volume, sperm concentration, sperm plasma membrane functionality and sperm plasma membrane integrity.

Results & Conclusion: The results showed that the body weight changes of roosters had a positive correlation with semen volume, sperm motility, sperm concentration and sperm production. The semen volumes were positively correlated with sperm motility, sperm concentration, sperm production, sperm plasma membrane functionality and sperm plasma membrane integrity. In conclusion, the body weight changes can affect the reproductive performance of roosters, and the immediate weight loss of rooster will have irreparable negative effects on the reproductive performance.

Keywords:body weight, grandparent roosters, sperm motility, semen volume

Hemangiosarcomain the beak of arose-ringed parakeet (*Psittacula krameri*)- A case report

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A 5-year-old male rose-ringed parakeet (*Psittacula krameri*)with relatively poor body condition was presented with two round, growing, and bleeding masses on the right and left side of the face on the maxillary bone (12 x 5 mm and 6 x 4 mm, respectively). Systematic anesthetic withisoflurane was used to remove both masses before electrocautery surgery.Histologic evaluation of the tumoral mass revealed numerous irregular blood-filled vascular channelslined by plump endothelial cells and also a solid pattern with fewer vascular spaces. Neoplastic cells had spindle, round to oval nuclei with a scarce to moderate amount of eosinophilic cytoplasm and weresupported by a dense fibrous connective tissue stroma. Extensive areas of necrosis and hemorrhagewere observed. There were cholesterol clefts. The final diagnosis of the disease was hemangiosarcoma.

Keywords: Rose-ringed parakeet,*Psittacula krameri*, Maxillary bone, Histology, Hemangiosarcoma

Bone fracture fixation in a Mynah bird using pin insertion

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Objectives: In this case report, a description of the fixation procedure of a complete fracture in the hind limb of a mature mynah bird is discussed.

Materials & Methods:a mature male Mynah bird, weighing about 120 g, was presented to the Mehregan Pet Animal Clinic, Shahrekord, with the complaints of inability to move the left leg, partial non weight- bearing lameness, reduced grip and control of the affected limb and reduced appetite. The bird was lethargic. After history taking, apparently the fracture was occurred in the past 10 hours before referring to the clinic. After physical examination and radiographic evaluation, a fracture in tibiotarsus bone was observed. For definitive treatment, the internal fixation through intramedullary pin insertion was considered.the bird was prepared for fixation surgery through proper aseptic surgical preparation. Induction and maintenance of the anesthesia were performed using inhalation of Isoflurane gas. Two intramedullary pins were longitudinally inserted into tibiotarsal bone. After surgery and resolution of anesthesia, analgesic (meloxicam) and antibiotic (enrofloxacin) medications were administered for prevention of infection and pain management for 4 days.

Results & Conclusion:after 21days post - surgery, the bird completely recovered from the surgery and the ability to use the affected limb was restored and the pins were extracted from the fracture site. In this method, there was no need to use Altman splinting to provide sufficient fixation and insertion of intramedullary pins was adequately effective for fixation and complete healing of the bone.

Keywords: Fracture fixation, Mynah bird,Pin insertion, Tibiotarsal fracture

A study on ectoparasites of domesticated pigeon (Columba livia domestica) in Iran

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Ectoparasites are a group of arthropods sheltering on various birds and feeding on their blood, feathers, skin and scales and may cause some of problems such as decreasing feed intake, weight loss and growth retardation.Some of these kinds of arthropods like*Dermanyssusgallinae*can also feed on some species of mammals, includinghumans, causing dermatitis and skinlesions.This research was conducted to estimate the prevalence and ectoparasites diversity in pigeons of Parchin region in south part of Ardabil Province, Iran. Generally 105pigeons were selectedrandomly from some cubbyholesto examine for the presence of different ectoparasites.Ectoparasites were collected from different parts of the body. Theectoparasites samples were preserved in 70% alcohol and cleared in lactophenolforidentification.The results showed that all of pigeons were infested to ectoparasites. There was no significant difference between males and females (P>0.05). Two species of ectoparasites were identified:*Dermanyssusgallinae*(42.86%) and *Columbicolacolumbae* (57.14%).This research revealed thehigh prevalence of ectoparasites of pigeons in Parchin, Ardabil, Iran.Besides, *Columbicolacolumbae* in adults and *Dermanyssusgallinae* in pipers were the most prevalent ectoparasites of these pigeons.

Key words: Cubbyhole,Ectoparasite, Pigeon, Prevalence

A survey of ostrich hatcheries sanitation (Entrobacterial and Fungal contamination) in Tehran Province

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Embryonic death is known as one of the most critical factors in financial loss of Ostrich farms. Bacterial contamination of fertile eggs is the most common cause of this problem. The majority of bacteria that were cultured from mortalities in ostrich hatcheries included the ubiquitous bacteria. Afew of these bacteria can cause inflammation in the reproductive tract and enter into eggs consequently. The aim of this research which has been done for the

first time in the country was to study the status of bacterial contamination of ostrich hatcheries.

Atotal of 120 samples in a weekly manner were collected from three ostrich hatchery units during a 3 month period. After disinfection of eggs' shells in laboratory, the eggs were opened at their air chambers area near the flame. Then, the dead embryos were dissected and samples were collected from different organs.

Detection of isolates was done using standard bacteriological techniques and based on their biochemical specifications.

Bacterial contaminations were detected in 56 (%46.6) out of 120 samples. More than one type of bacteria was detected in 25 (44.6%) contaminated samples. The status of observed bacteria insamples was as follows: Pseudomonas spp. (23.3%), Escherichia coli (20%), Klebsiella spp. (7.5%), Bacillus spp. (5.8%), Citrobacter spp. (5%), Staphylococcus spp. (5%), Proteus spp. (3.3%), Aeromonas spp. (0.8%), Enterobacter spp. (0.8%). No bacterial contaminations were deceted in 53.3% of 120 samples.

In conclusion, it is recommended to reduce the contamination of ostrich fertile eggs sufficient attention should be paid to the sanitary conditions and managerial standards in breeder flocks during collection and preservation of fertile eggs and in hatchery facilities.

Keywords: Ostrich, Embryonic death, Bacterial contamination

The effects of different levels of dietary calcium and phosphorus on some blood parameters and Tibialbone characteristics in broiler chickens

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Objectives: This study was conducted in order to evaluate the effects of different levels of dietary calcium and phosphorus on some blood parameters and Tibialbone characteristics and strength of broiler chickens. **Materials & Methods:**This study was done by completely randomized design with 6 treatments, 6 replicates, and 15 chicks (Arian strain) per replicate for 6 weeks. The experimental treatments were as below: 1- higher levels of Ca and P (+ 0.06, +0.03 %, respectively), 2- Ca and P level according to strain guideline, 3- lower levels of Ca and P (-0.06, -0.03 %, respectively), 4- lower levels of Ca and P (-0.12, -0.06 %, respectively), 5-lower levels of Ca and P (-0.06, -0.03 %, respectively) with adding bacterial phytase 10000 and VitD5000 IU, 6- lower levels of Ca and P (-0.12, -0.06 %, respectively) with adding bacterial phytase 10000 and Vitamin D 5000 IU.On 42 d, two birds with similar weight to each experimental unit was selected to obtain blood samples, then they were slaughtered. Calcium, phosphorus, ALP level of the serum blood of the birds were measured by using commercial kits. The left and right tibia of each bird were removed and de-fleshed by hand, then air-dried for 24 h at room temperature. The tibiotarsus length, weight, robusticity index, diaphysis diameter, Ca, P and ash content was determined. All data were analyzed by GLM procedure of SAS software.**Results & Conclusion:**Feeding different treatments hadno significant effect on the Ca, P and ALP levels of the broiler chicken ($P>0.05$). Dietary treatments had no significant effect on tibiotarsus diaphysis diameter of the birds ($P>0.05$). Tibiotarsus bone of the chicken fed with treatment 4 had lower levels of ash, Ca, and robusticity index compared with control group ($P<0.05$). However, feeding birds with treatment 5 increased the weight, length and ash content of tibial bone compared with control group($P<0.05$).In general, feeding lower levels of Ca and P (-0.06, -0.03 %, respectively) with adding phytase enzyme and 5000 IU Vitamin D improved the characteristics of tibial boneand its usage is recommended to Arian broiler producers.

Keywords: Alkaline phosphatase, broilers, tibial characteristics.

Evaluation of humoral and cellular immune responses of chitosan-based Newcastle nanoparticles vaccination with homokinin-1 molecular adjuvant

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Background and Aim: The global spread of Newcastle disease virus (NDV) in poultry has highlighted the need for improved immunization programs against the disease. In this study, the effect of hemokinin-1 (HK-1) as a biological agjuvant on the induction of humoral and cellular immune responses against chitosan-based NDV nanoparticles was investigated.

Materials and Methods: In this experimental study, , sixty SPF chickens were equally divided into six control and treatment groups. Control groups included received physiological serum, NDV inactivated antigen, and oil-adjuvantedNDV inactivated antigen; and treatment groups received chitosan, chitosan-based NDV nanoparticles, and the nanoparticles with HK-1. Based on the groupings, the chickens received each sample via eye drop on one day of age. Serum samples were collected at defined intervals and the humoral immune response was assessed by hemaagglutination inhibition (HI) test. Stimulation of the cellular immune response in different groups was assessed using cutaneous basophil susceptibility response (CBH).

Results: Addition of HK-1 to NDV nanoparticles increased the mean HI antibody titer compared to the group receiving nanoparticles alone. The difference in immune response between these two groups was significant ($P < 0.001$). CBH test data showed a significant difference ($P < 0.001$) in inducing cellular immune response in the groups receiving oil-adjuvantedNDV inactivated vaccine, nanoparticles alone, and the combination of nanoparticles and HK-1 with control groups.

Conclusion: Based on the data, chitosan based-nanoparticles with HK-1 adjuvant can induce specific humoral and cellular immune responsesagainst NDV.

Keywords: Newcastle disease, nanoparticle, hemokinin-1, chitosan, immune response

Effect of Virkon S onsurvival rate of chicks in disinfectionof fertile eggs

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Objectives: It is tried in this investigation to evaluate the efficiency of a widely spectrum disinfectant (Virkon SR) with commercial conditions (using of formaldehyde gas) in disinfecting surface of eggs, and the biological characteristics of fertile eggs such as the rate of hatchability, survival of hatched chicks, microbial culture of the chicks and probably losses of chicks.

Materials & Methods: To determine the effect of Virkon S on survival rate and microbial population, 120 fertile eggs from broiler breeder farms collected and divided into 4 equal groups. In-group 1 and 2, all eggs sprayed with Virkon S in 1/100 and 1/200 dilutions, respectively. In-group 3, the eggs were disinfected with formaldehyde and in-group4, the eggs were sprayed with sterile water, as negative control. All eggs incubated for 21 days and assayed hatchability rate. After hatching, the chicks monitored for 7 days and the survival rate recorded. Furthermore, the contamination of non-hatched embryo examined for Escherichia coli.

The eggs that disinfected with 1/100 dilution of Virkon S had lower hatchability and growth indices but not in 1/200. It seems Virkon S can be a good alternative for disinfection of fertile eggs with proper concentration and condition.

Results & Conclusion: The results of this study showed that the eggs were disinfect with virkon S with concentration of 1/100 possess lower hatchability and growth indices. Therefore, it seems virkon S can be a good candidate for disinfection of fertile eggs in proper concentration and condition.

Keywords: Virkon S, formaldehyde, hatchability, disinfection, Escherichia coli

Inhibition of Parrot bornavirusby shRNAstargeting Polymerase gene

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Objectives: Psittaciformorthoborna viruses are currently considered to be a major threat to the psittacinebird population worldwide. Parrot bornavirus (PaBV) was identified recently in Iran and, since then, few studies have been conducted to understand the treatment ways of PaBV in captive psittacine birds. Therefore, in the present study the first steps for design treatments against PaBV were performed.

Material &Methods: ShRNAsequences were designed against Lgeneof Parrot bornavirus 1 using the www.invivogen.com/sirna-wizard website and the most effective molecules were selected using background information. For this purpose, standard search method selected and siRNA motifs with the desired size and thermodynamic properties were designed. Then, in order to design hairpin, the proposed vector and loop sequences (TCAAGAG) submitted, so the most effective shRNAs with desired restriction enzyme sites were designed.

Results&Conclusion: Three potentially effective shRNA molecules were designed. Their sequences and start target positions included PPD

shRNA1:
ACCTCGTGGTCGGAATAAATCGTACTTCAAGAGAGTACGATTTATTCCGACCACTT, PPD
shRNA2:
ACCTCGCAATCAGGTATGCCTTAACATCAAGAGTGTTAAGGCATACCTGATTGCTT and PPD

shRNA3:
ACCTCGATGCAACAGATCGATACGTATCAAGAGTACGTATCGATCTGTTGCATCTTwith respectively start positions of82, 364 and 1099 of avian borna virusvirusLgene.The results showed that there are potentially effective shRNA molecules against Parrot bornavirus 1 L genethat can suppress its translation and can be considered as an antiviral approach based on RNAi.

Keywords: Polymerase, gene therapy, Parrot bornavirus 1,shRNA.

Adenocarcinoma tumor diagnosis in a layer chicken of local breed in Chaharmahal and Bakhtiari province

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Objectives:in the current study, histopathological investigation of an internal tumor mass of unknown origin is presented in details.
Materials & Methods:a layer chicken of local breed (aka backyard chickens)out of nine unvaccinated chickens was referred to the veterinary clinic of veterinary faculty of Shahrekorduniversity with the clinical symptoms of reduced appetite, reduced food and water consumption, stopped egg laying in the past 15 days, severe weight loss, severe abdominal swelling and reduced motility. After necropsy, muscular regeneration, ascites, salpingitis and a mass was observed on the ovary. About 200 cc fluid was extracted from the abdominal cavity and the tumor weighed about 360 gr. The tissue sample was obtained from the mass and the surrounding membrane. The mass sample was placed in 10% formalin solution for 24 hours and then the formalin solution was changed for better infiltration of formalin into the sample tissue and fixation of the tissue. Then the sample tissue was referred to the veterinary laboratory of the clinic and the prepared histological slides were assessed by the veterinary pathology expert.
Results & Conclusion: Histologically, the isolated mass contains the nest of atypical cells with numerous nucleoli and bizarre cells originated from the epithelial gland cells that indicate the adenocarcinoma lesion in the sampled mass.

Keywords: Layer chicken, Adenocarcinoma,Histopathology, Salpingitis, Ascites

In ovo Injection of Synbioticalong with Infectious Bursal Disease Vaccine in Broiler Chickens

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Objectives: The present studyinvestigated the efficacy of a synbiotic along with an Infectious Bursal Disease (IBD) vaccine in Cobb 500 broiler chickens. A total of 1200 embryonated chicken eggs were randomly allocated in 10 groups with eight replicates.

Materials & Methods: The first group was served as control group,the second group was vaccinated against IBD during growing periodon day 14 (VG), the third group was vaccinated against IBD on day 18 of incubation (IV), the fourth group received in-diet synbiotic continuously and *in ovo* vaccine(GS+IV), the fifth group received a single dose of symbiotic on day 18 of incubation (IS), the sixth group received *in ovo* and in-diet synbiotic (IS+GS), the seventh group received *in ovo* synbiotic also vaccinated during growing period (IS+VG), the eighth group received *in ovo* and in-diet synbiotic and vaccinated during rearing period (IS+GS+VG),the synbiotic and the vaccine were administered *in ovo* (IS+IV) in the ninth group, and the tenth group received *in ovo* and in-diet synbiotic, plus *in ovo* vaccine (IS+GS+IV).

Results & Conclusion: The IS group, individually or in combination with GS, IV and VG have a positive effect on body weight. The IS+GS+VGgroupindicated higher weekly weight gain. Continuous synbiotic diet caused a higher feed conversion ratio in all weeks, expect the third week. In most of the weeks, the IS groups individually or along with GS, VG or IV treatment groups could improve feed intake. The antibody titer of IBD was higher for groups that received IV along with symbiotic compared to other groups. *Synbiotic* treatment significantly reduced intestinal microbial load compared to the groups fed by basal diet. It is concluded the application of synbiotic along to IBD vaccine can improve growth performance and have positive effects on IBD antibody titer and immune response.

Keywords: Broiler chickens, *in ovo* injection, Infectious bursal disease vaccine, Synbiotic

Encapsulation of inactivated Newcastle disease virus onto the chitosan nanoparticles for use in mucosal immunity

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Background and Aims: Newcastle disease virus (NDV) as the causative agent of a serious respiratory infection threatens the poultry industry worldwide. The risk of an outbreak of NDV could be restricted by mass vaccination. Here we brought up methodology to generate chitosan (CS)-based NDV nanoparticles as an antigen carrier for delivery into intranasal mucosa.

Materials and Methods: The NDV antigen was produced in the allantoic cavity of 9-11-day embryonated SPF chicken eggs. The virus was tittered and inactivated by ethylene imine.The CS nanoparticles were prepared by ionic gelation method. The physicochemical properties including size, distribution, charge, and morphology of the particles were evaluated. The CS-based NDV nanoparticles were prepared by encapsulation of the inactivated NDV antigen and validated based onthe factors affecting optimal encapsulation.The toxicity and safety of the nanoparticles were assayed using inoculation of HLM cells as well as by administration of SPF chickens.

Results: The CS nanoparticles were produced with an average size of 196 nm and good morphology.After encapsulation of NDV antigen, the mean diameter of the nanoparticles was 328 nm with an encapsulation efficiency of ~83% and loading capacity of ~54%. The electron microscopy study indicated that the particles have a spherical shape.The *in vitro*cytotoxicity and the *in vivo*safety of the CS-based NDV nanoparticles results indicates the particles were not toxic either in LMH cells or in chickens.

Conclusion: By considering factors that represent optimal nanoparticles, the safe inactivated NDV nanoparticles were successfully developed. This study lays the foundation for the further development of mucosal vaccines and drugs encapsulated in chitosan nanoparticles. By considering factors that represent optimal nanoparticles, the safe inactivated NDV nanoparticles were successfully developed. These results provide a foundation for the further development of mucosal vaccines based on inactivated antigens for use in chicken.

Keywords: Newcastle disease, Chitosan, Nanoparticles, Encapsulation

Effect of organic dicalcium phosphate on performance of broiler chickens

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Objectives: Due to the limitation of raw materials required for production of inorganic dicalcium phosphate (DCP) in Iran, the amount of production of this material has decreased and therefore its price has increased. To solve this problem, it is possible to use organic DCP, which is a byproduct of gelatin production. Of course, before it is possible to recommend organic DCP to poultry feed producers, it is necessary to measure this issue scientifically. Therefore, the aim of this research was to compare the effect of DCP with inorganic and organic source on performance of broiler chickens.

Materials & Methods: The experiment was conducted with 280 one-day-old male broiler chicks of Ross 308 in a completely randomized design with 7 treatments, 4 replicates and 10 observations per replicate for 35 days. Phosphorus from two sources of phosphorus supply (DCP with inorganic and organic sources), at three levels (0.15, 0.30 and 0.45), added to basal diet containing 0.15 phosphorus. Body weight and feed consumption by birds were measured at 7, 14, 21, 28 and 35 days, and feed conversion ratio was calculated. At the end of experiment, two birds per replicate were randomly selected for slaughter. Carcass weight, breast muscle and thighs were measured and relative weight of carcass components was calculated. The collected data were statistically analyzed by SAS software and GLM procedure. Duncan's test was used to compare the differences between means.

Results & Conclusion: Mortality of chickens consumed basal diet were more than diets containing 0.15, 0.30 and 0.45% available phosphorus ($P<0.05$). The lighter body weight and less feed consumption of chickens received basal diet compared to experimental treatments were visible since end of second week ($P<0.05$). Also, at the end of 35 days, chickens fed basal diet had lower carcass percentage and relative breast weight than experimental treatments ($P<0.05$). Considering that no significant difference was seen between performance of birds fed with DCP with organic and inorganic sources, therefore it seems that organic DCP can also be used for feeding broiler chickens. However, before recommending the use organic DCP to prepare poultry feed, it is necessary to measure the physical and chemical properties of this substance, as well as its relative bioavailability compared to the standard substance.

Keywords: Breast muscle, carcass, feed conversion ratio, mortality, thigh

Detection of QX bronchitis strain in different ages of broilers by RT-PCR

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Objectives:infectious bronchitis is an acute, highly contagious disease of broiler chickens and has major economic importance in commercial chicken flocks throughout the world. It is characterized by respiratory signs, although decreased egg production and poor egg quality are sometimes seen in breeders and layers. Some strains of the etiologic agent, infectious bronchitis virus (IBV), are nephrophathogenic, causing interstitial nephritis, particularly in chicks. In the current study, the QX variant of the infectious bronchitis virus was cultured in embryonated eggs and, the harvested virus was administrated in two different equally chicken groups by the ocular route.

Methods & Materials: In the first place, 20 embryonated eggs were selected for the propagation of the infectious bronchitis virus. After extracting the liquid from the eggs that contained the virus, the presence of the virus was confirmed by RT-PCR test, and also the titer was determined.

In this research, 40 broilers of breed 308 were prepared and divided into two groups, A and B. Group B was the control group. The chickens were under standard breeding conditions. The Bronchitis virus was inoculated on the first day of keeping the chickens through the eyes. At first, the virus was diluted 50:50 by PBS buffer. The Blood was taken from the chickens on days 1, 3, 7, 10, and 20. Afterward, the blood samples were sent to the laboratory for checking the virus load and titer using the Real-Time PCR test.

Results & Conclusion:Different molecular methods have been evaluated to identify the virus genome. Meanwhile, molecular methods based on real-time PCR are preferred over other molecular diagnostic methods due to their simplicity, sensitivity, and extremely high specificity. According to the results of various studies, it can be concluded that the QX bronchitis virus is one of the important strains in our country, and due to its irreversible effects on the reproductive system, more studies should be done. In a recent study, it has been shown that the real-time molecular method Real-Time PCR is a suitable method for quick and accurate detection of infectious bronchitis virus, the QX strain, in experimental samples contamination with this virus. The ability to detect the virus was checked on different days.

Keywords: PCR, Real-Time PCR, Infectious Bronchitis, QX strain,Broiler Chickens

Effect of organic dicalcium phosphate on bone characteristics of broiler chickens

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Objectives: Dicalcium phosphate (DCP) is considered the most important phosphate product in livestock and poultry nutrition and provides more than 85% of the mineral phosphorus required by poultry. But in last forty years, losses due to leg abnormalities that occur at the end of breeding period have been one of the major problems of country's poultry breeding industry. This abnormality causes the removal of a significant part at the end of breeding period. Therefore, the aim of present experiment was to find out whether use of organic DCP can improve properties of broiler chicken bones compared to inorganic DCP**.**

Materials & Methods: Experiment was conducted in a completely randomized design with 7 treatments, 4 replications and 10 male broiler chickens of Ross308 in each replication. Treatments included seven types of experimental feed for each of starter, grower and finisher. Phosphorus from two sources of phosphorus supply (DCP with inorganic source and DCP with organic source), at three levels (0.15, 0.30 and 0.45), added to the basal diet containing 0.15 phosphorus. At the end of 7, 14, 21 and 35 days of age, number chickens with rickets in each experimental unit was counted. At 35 days old, after blood sampling, tibia bones of right and left legs of two killed chickens from each experimental unit were separated. Then, parameters of length, diameter, strength, percentage of ash and phosphorus of tibia bones, as well as serum alkaline phosphatase were measured. Data were statistically analyzed using SAS software and GLM procedure. Duncan's test was used to compare the differences between means.

Results & Conclusion: Results of 35 days showed that in chickens receiving basal diet, serum alkaline phosphatase was lower, the length of tibia was shorter and strength of bone was weaker than other experimental groups ($P<0.05$). Chickens that received 0.30% phosphorus from organic DCP had shorter bone length than the same level of inorganic DCP ($P<0.05$). There was no significant difference between organic and inorganic sources of DCP in terms of bone diameter, strength, percentage of bone ash and phosphorus. The use of DCP with organic source does not have a negative effect on the parameters which were measured on tibia bone. But it is recommended to judge more accurately impact of organic DCP on chickens leg abnormalities, parameters of weight, volume, density, angle of bone deformation as well as bone morphology should also be examined.

Keywords: Alkaline phosphatase, bone strength, bone length, rickets

Histomorphometric study of pancreas tissue in broiler chicken

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Objectives:the aim of this study was to investigate the histomorphometric parameters of pancreas tissue in a healthy broiler chicken.
Materials & Methods:the base and apex regions of a healthy pancreas tissue, resected from a healthy broiler chicken while performing necropsy, were obtained for tissue sampling and histological slide preparation. Then using optical microscopy, photos from random fields of each slide were taken and theimages were assessed for the number of nuclei of the cells as an indicator of the density and population of the cells. In order to count the cell nuclei, the Area Fractionator method was used; in which a 48 point grid was placed on the images, aligned concentrically with the image and the all of the points including the nuclei were considered. Then the mean of each slide total count was calculated and compared using one way ANOVA statistical test with a following Tukey post hoc test.
Results & Conclusion:after performing statistical tests, no significant difference was observed among cell nuclei count between apex and base regions of the pancreas. We can conclude that the population of the cells in this sample of the broiler chicken we sampled are approximately identical and evenly distributed.

Keywords: Histology, Histomorphometry, Pancreas, Cell Count, Cell Nuclei

Prevalence of Avian Gastric Yeast(*Macrorhabdusornithogaster*) in Pet Birds

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Objectives: The avian gastric yeast (*Macrorhabdusornithogaster*) is a common and harmful microorganism that infects pet birds worldwide. *Macrorhabdusornithogaster*, previously named Megabacter, could infect a large group of companion birds, such as African gray parrots,budgerigars,cockatiels, green-cheeked parakeets andlovebirds. The aim of the present study was to evaluate the prevalence of Megabacterinfection in pet birds of Mashhad city, Iran.

Materials & Methods: Seventy cockatiels, 20 gray parrots, 30 lovebirds, 20 green cheeks, and 30 budgerigars were investigated in present study fromMarch to November 2022. The referred birds had symptoms, such as gasping, anorexia, regurgitation,lethargy, and weight loss. The sterile fecal samples were collected from all birds. The samples were randomly evaluated for gastric yeast (Megabacter) using the gram-staining method. A 14-day treatment of nystatin, apple vinegar, and metronidazole was applied for all cases, and then fecal samples were collected for gram-staining after three weeks.

Results &Conclusion: The results revealed that 72 percent of the symptomatic cases were infected by non-active or active yeasts. A 14-day treatment of nystatin, apple vinegar, and metronidazole could successfully save 96 percent of birds and reduced the detection of non-active or active yeasts in fecal samples. It looks, infection occurrence was related to food hygienewhich should be control very carefully by state regulatory systems.

Keywords: Gastric yeast, Companion bird, Apple vinegar, Parrot

Evaluation of resistance to Carbapenems and Carbapenemase enzyme production in *Escherichia coli* isolated from broiler chickens in Guilan

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Objectives: In each region, it is necessary to know the antibiotic resistance of common pathogenic bacteria. Poultry colibacillosis caused by infection with *Escherichia coli* is one of the most common bacterial diseases that appear in various forms. The aim of this study was to determine the pattern of antibiotic resistance in *E. coli* isolated from broiler chicks, determine the effect of carbapenem antibiotics on *E. coli* isolated from broiler chicks, and to investigate the potential of carbapenemas production in E. coli isolated from chickens in the province of Guilan.

Materials & Methods: In this study, 120 samples of different tissues (lung, liver, trachea and blood) from 12 farms were collected from broiler chickens suspected to be infected with Escherichia coli from chicken farms in Gilan province between August and September. Following culture on MacConkey agar and EMB, suspected colonies were identified by phenotypic testing. Susceptibility to carbapenems was tested in 32 confirmed isolates, by disk diffusion. Carbapenem-resistant isolates were subjected to PCR for detection of carbapenemase-encoding genes

Results & Conclusion: All isolates (100%) were resistant to imipenem. In the phenotypic test, all isolates (100%) were identified as cobapnemase, and 7 isolates (21. 875%) were identified in the PCR reaction with a length of approximately 382 bp, producing and possessing the VIM gene. Also, in 12 isolated isolates (37.5%), with an approximate length of 587 bp, a component was detected in terms of the presence of a positive IMP gene. The results of our study on *Escherichia coli* isolates show the presence of relative resistance to cephalosporin antibiotics, which can be considered as the result of ESBL producing plasmids. Based on the results, antibiogram is recommended before any treatment for poultry colibacillosis**.**

Keywords: *Escherichia coli*, Antibiotic resistance, Poultry, Carbapenemas, Guilan.

Evaluation of beta-lactam resistance and broad-spectrum beta-lactamase production in *Escherichia coli* isolated from broilers in Guilan

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Objectives: In each region, it is necessary to know the antibiotic resistance of common pathogenic bacteria. Poultry colibacillosis caused by infection with *E. coli* is one of the most common bacterial diseases that appear in various forms and can be economically damaged. It gives attention. The aim of this study was to determine the pattern of drug resistance in *E. coli* isolated from broiler chicks, determine the effect of beta-lactam antibiotics on *E. coli* isolated from broiler chicks, and to investigate the potential of Beta Lactamase production in *E. coli* isolated from chickens in the province of Guilan.

Materials & Methods: In this study, 120 samples of different tissues (lung, liver, trachea and blood) from 12 farms were collected from broiler chickens suspected to be infected with *Escherichia coli* from chicken farms in Gilan province between August and September. Following culture on MacConkey agar and EMB, suspected colonies were identified by phenotypic testing. Susceptibility to betalactamase was tested in 32 confirmed isolates by disk diffusion. betalactam-resistant isolates were subjected to PCR for detection of betalactamase-encoding genes.

Results & Conclusion: 31 isolates (96.87%) were Beta Lactamase production in the phenotypic test. 7 isolates (21. 9%) were identified in the PCR reaction with a length of approximately 847 bp, producing and possessing the TEM gene, in 11 isolated isolates (34/4%), with an approximate length of 214 bp, a component was detected in terms of the presence of a positive SHV gene and also 3 isolates (0.9%) were identified in PCR reaction producing and processing both the TEM and SHV genes. Based on the results, antibiogram is recommended before any treatment for poultry colibacillosis.

Keywords: *Escherichia coli*, Antibiotic resistance, Poultry, Betalactamas, Guilan.

Estimation biological availability of organic Dicalcium phosphate in poultry nutrition

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Objectives: The aim of this experiment was to estimate relative bioavailability of a type of organic DCP, which biological usability in poultry feeding has not been determined so far.

Materials & Methods: Inorder to estimate bioavailability of DCP in organic source (19.5% phosphorus) compared to standard source (phosphoric acid 85%, containing 26.87% phosphorus), 280 one-day-old male broiler chickens of Ross 308 were used in a completely randomized design with 7 treatments, 4 replications and 10 observations per replicate for 35 days. Phosphorus from two sources of phosphorus supply at three levels (0.15%, 30% and 45% of the diet) was added to basal diet containing 15% available phosphorus. To estimate relative bioavailability of available phosphorus in tested DCP source, the slope ratio method was used in SAS software. Based on slope ratio method, linear dependence of dependent variables (body weight, feed conversion ratio, serum alkaline phosphatase, breaking force and length and percentage of bone ash) were calculated from independent variable (phosphorus added levels).

Results & Conclusion: Details related to examination of three prerequisite hypotheses for estimation of relative bioavailability in tested substance included estimation of line slope, standard error of line slope, relative bioavailability, width from origin and coefficient of determination. Probability level was also calculated for linear subordination, non-linear subordination (quadratic), difference in width from origin of two lines, difference in width from origin of zero and estimated level, difference in slope of two lines and finally effect of available phosphorus level of source added to basic ration. All mentioned items were calculated for body weight, feed conversion ratio, serum alkaline phosphatase logarithm, tibia breaking force logarithm, tibia length logarithm, tibia diameter logarithm, tibia ash content and tibia ash phosphorus content. Comparison of DCP bioavailability with standard source, estimated by linear slope ratio method of logarithm of tibia length at age of 35 days, from level of available phosphorus supplied from DCP added to basal diet. It showed that regarding logarithm of tibia length, availability of phosphorus in this DCP was not significantly different from standard. According to this research, DCP with organic source has been tested and has a favorable bioavailability for use in feeding broiler chickens.

Keywords: Broiler, dicalcium phosphate, relative bioavailability

Fibrosarcoma tumor diagnosis in a Gray Cockatiel in Chaharmahal and Bakhtiari province

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Objectives: In the current study, histopathological investigation of a tumor mass of unknown origin is presented in details.

Materials & Methods:A mature 2 year old male normal gray cockatiel with the weight of 85 gr was referred to the veterinary clinic of veterinary faculty of Shahrekord university with no unusual clinical symptoms. the appetite and food and water consumptionwere normal. The bird was not lethargic and the behavior was normal. After physical examination, a mass of unknown origin was observed on the dorsal surface of the head, approximately near the ear under the superficial layer of the skin. No metastasis or attachment was observed to underlying layers and the margins of the mass were clear. The Fine Needle Aspiration technique was performed and nofluid was extracted from the mass. for removal of unknown mass, surgical excision was considered. For anesthesia, intramuscular injection of Ketamine (20 mg/kg) and Diazepam (1 mg/kg) was done. After proper surgical preparation and aseptic protocols, thesample was obtained from the mass. The site of resected tumor was sutured with mattress sutures using 3.0 Vicryl suture material. The mass tissue sample was placed in 10% formalin solution for 24 hours and then the formalin solution was changed for better fixation with higher infiltration of formalin into the sample tissue. Then the sample tissue was referred to the main laboratory of the veterinary clinic and the prepared histological slides were examined by the veterinary pathology expert.

Results & Conclusion: After histopathological evaluation, collagen fibers with a disorderly pattern of alignmentand the presence of the anaplastic fibroblasts were observed, indicating fibrosarcoma in the investigated mass.

Keywords: Fibrosarcoma, Gray Cockatiel, Histopathology

The effect of food coating based on Nano-chitosan containing different concentrations of *Bunium Persicum*essential oil on the shelf life of chickenmeat in refrigerated condition

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Objectives: Due to its physical and chemical characteristics, fresh chicken meat is susceptible to spoilage even at Refrigerated temperatures. Edible coatings are a thin layer consisting of carbohydrates, lipids or proteins. Nano-chitosan (NC) is a natural biopolymer that improves the physical, microbiological and chemical properties of the main skeleton of food films and coatings. This biopolymer is biodegradable and environmentally friendly. *Bonium persicum* essential oil (BPEO) as a plant derived compound has antimicrobial and antioxidant effects.The aim of this study was to evaluateNC Coating incorporated with Different Concentrations of BPEO on the shelf life of Chicken Meat during 12 daysof Storage in Refrigerated**.**

Materials & Methods: Coating forming solutions (CFS) were prepared using an aqueous solution. NC was dissolved in acetic acid and then its pH was adjusted with NaOH to produce a 2% solution.Then 3% of glycerol(as a plasticizer)and BPEO1%, 2%, and 3% (v/v) were added to the solutions and Homogenization of CFS was done by using a Homogenizer at 12000rpm for 2 min.After removing the chicken fillets aseptically (1 hour after slaughter), the samples were divided into 5 groups and cut into 70 g pieces with a sterile knife. Chicken meat fillets were immersed in a prepared solution for 1 minute. Afterwards , the samples -both coated and uncoated- were put in sterile polypropylene bags and stored at 4 ° C. Microbiological and chemical characteristics were evaluated in a period of 12 days storage (days 0, 2, 4, 7, 9, and 12).

Results & Conclusion: The results of this study showed that the chemical and microbial characteristics of coated chicken fillets improved compared to the control group (P< .05). Also, with the increase in the concentration of the EO, the shelf life of the samples increased, so that in the sample containing NC+ 3% BPEO, the aerobic mesophilic bacteria count on the last day of the storage was 6.91 log CFU/g, while this amount for Control, NC, NC+ 1%BPEO, NC+ 2%BPEO, was 7.77, 8.24, 8.92, 9.65 respectively. Also, according to the amount of total volatile nitrogen in the groups containing EO, the spoilage of meat fillets was delayed by 2-5 days compared to the control group.According to the results of this study, it was proved that by coating chicken meat with NC and different concentrations of BPEO, its shelf life in refrigerator conditions increased.

Keywords: Chicken meat,Food coating, Nano-chitosan,Essential oil, *Bonium persicum*

The effect of parsley on histological and stereological structure of bursa of Fabricius in broilers

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Objectives: In recent years, it has been found that medicinal plants could be the best natural resources for antioxidants to prevent cellular oxidative damage. Medicinal herbs are rich in active antioxidant and immune-modulatory components, which can justify their application in the prevention and treatment of different diseases in broilers. This study was designed to examine the effect of parsley, *Petroselinumcrispum*, on the development and structure of the bursa of Fabricius in broilers.

Materials & Methods: This study was conducted on 30 one-day-old top chickens of the Cobb breed, which were randomly divided into two groups (each group with three replications), including control and treatment. While the control group was fed a standard diet until the end of the experimental period, the treatment group was fed daily with fresh chopped parsley mixed with diet (10 g per 1 kg diet) from the37th day. On the 50th day, the chickens were slaughtered, and their bursa of Fabricius was removed and fixed in 10% neutral buffered formalin. Tissue samples were processed by routine and standard paraffin embeddingand serially sectioned by a rotary microtome. The sections were selected through systematic random sampling and stained by H&E. Stereological studies were performed using an unbiased stereological technique and the optical fractionator method in a stereo-investigator system. Finally, the t-test was used to compare two groups.

Results & Conclusion: The stereological studies showed that although the thickness of the tunica muscularis and the height of the plicaedid not change significantly between the two groups, the wide of plicae, size and number of the follicles in each plica and volume density of the follicle and medulla significantly increased in the treatment group compared with the control group (P<0.01).Considering that the bursa of Fabricius is the primary site for the development of lymphocytes, which are responsible for humoral immune responses in chicken, it can be concluded that parsley can strengthen the humoral defense system in broilers by improving the histological structure of the bursa of Fabricius.

Keywords: Bursa of Fabricius, Parsley, Histology, Stereology, Broilers

Investigating the chemical, sensory and microbial properties of ostrich meat packed in a film containing pomegranate peel powder extract in refrigerated condition

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Objectives: The purpose of this study is to investigate the extract of pomegranate peel powder in a double-layer film to increase the shelf life of ostrich meat at refrigerator temperature (4 ºC).

Materials & Methods: Ostrich meat was placed in two-layer films with 1, 3, and 5%ratios of pomegranate peel powder extract, then chemical and microbial properties along with sensory assessmenton ostrich meat during storage (1, 3, 5, 7, and 10) was evaluated.

Results & Conclusion: The results showed that the microbial evaluation (Aerobic plate count and *Pseudomonas* spp. count), chemical properties including: pH, lipid oxidation, and sensory properties in samples containing 5% pomegranate peel powder extract in refrigerated condition, improved compared to other samplesafter 10 days of storage.But it had an unfavorable color. Therefore, 3% of samples containing pomegranate peel powder extract were preferred. In general, the film containing pomegranate peel powder extract is recommended as an active packaging for poultry meat storage.

Keywords: Ostrich meat, Pomegranate peel powder, Film, Active packaging

Pomegranate juice alter microscopical structure of cloacal bursa in broilers

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Objectives: Today, natural products are considered a main and important source of new bioactive agents in the poultry industry to control and treatmany diseases in broilers.Pomegranate juice is well known for its numerous medicinal applications. The cloacal bursa is the main primary lymphoid organ that regulates humoral antibody production, and its structural development can be affected by various factors such as disease and nutrition. Therefore, this study was conducted to evaluate the effect of pomegranate juice on the development and microscopicalstructure of the bursa of Fabricius in broilers.

Materials & Methods: This study was conducted on 30 one-day-old top chickens of the Cobb breed, which were randomly divided into two groups (each group with three replications), including control and treatment. While both groups were fed a standard diet until the end of the experimental period, from the 37th day until the end of the experiment, the treatment group was fed sour pomegranate juice mixed with water in a ratio of 1 to 3. On the 50th day, the chickens were slaughtered, and their bursa of Fabricius was removed and fixed in 10% neutral buffered formalin. Tissue samples were processed by routine and standard paraffin embedding and serially sectioned by a rotary microtome. The sections were selected through systematic random sampling and stained by H&E. Stereological studies were performed using an unbiased stereological technique and the optical fractionator method in a stereo-investigator system. Finally, the t-test was used to compare two groups.

Results & Conclusion: The stereological studies indicated that although the thickness of the tunica muscularis, the height and widthof the plicae, and the number of follicles in each plicadid not change significantly between the two groups, the size of the follicles,the volume density of the follicles, and the volume density of the cortex and medullasignificantly increased in the treatment group compared with the control group (P<0.001). The bursa of Fabricius is an immunological organ that plays a primordial and key role in poultry immunity, and different environmental factors such as diet can influencethe histological and physiological development of the bursa of Fabricius. According to the findings of this study, pomegranate juice can stimulate and improve the structural development and possibly the function of the cloacal bursa in broilers.

Keywords: Cloacalbursa, Bursa of Fabricius, Pomegranate juice, Histology, Stereology, Broilers

Inhibition of Parrot bornavirusby shRNAstargeting Polymerase gene

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Objectives: Psittaciform or thobornaviruses are currently considered to be a major threat to the psittacinebird population worldwide. Parrot bornavirus (PaBV) was identified recently in Iran and, since then, few studies have been conducted to understand the treatment ways of PaBV in captive psittacine birds. Therefore, in the present study the first steps for design treatments against PaBV were performed.

Material &Methods: ShRNAsequences were designed against Lgeneof Parrot bornavirus 1 using the www.invivogen.com/sirna-wizard website and the most effective molecules were selected using background information. For this purpose, standard search method selected and siRNA motifs with the desired size and thermodynamic properties were designed. Then, in order to design hairpin, the proposed vector and loop sequences (TCAAGAG) submitted, so the most effective shRNAs with desired restriction enzyme sites were designed.

Results&Conclusion: Three potentially effective shRNA molecules were designed. Their sequences and start target positions included

PPDshRNA1:
ACCTCGTGGTCGGAATAAATCGTACTTCAAGAGAGTACGATTTATTCCGACCACTT,PPD

shRNA2:
ACCTCGCAATCAGGTATGCCTTAACATCAAGAGTGTTAAGGCATACCTGATTGCTT
andPPD

shRNA3:
ACCTCGATGCAACAGATCGATACGTATCAAGAGTACGTATCGATCTGTTGCATCTT with respectively start positions of82, 364 and 1099 of avian borna virusvirusLgene.The results showed that there are potentially effective shRNA molecules against Parrot bornavirus 1 L genethat can suppress its translation and can be considered as an antiviral approach based on RNAi.

Keywords: Polymerase, gene therapy,Parrot bornavirus 1,shRNA.

Suppression of Parrot bornavirus using shRNAs targeting glycoprotein gene

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Objectives: The proventricular dilatation disease (PDD) is an emerging worldwide psittacine disease andit has become a major concern in the conservation of endangered species**.** Clinical signs and lesions are related to progressive gastrointestinal tract and/or neurological dysfunction, including progressive weight loss, regurgitation, undigested food in feces; crop, proventricular and intestinal stasis, proventriculardilatation, ataxia and proprioceptive deficits. Due the importance of parrots for their owners, attempts for their treatments- as we done in this work- have been developed in recent years.

Material &Methods: ShRNA sequences were designed against G gene of Parrot bornavirus 1 using the www.invivogen.com/sirna-wizard website and the most effective molecules were selected using background information. For this purpose, standard search method selected and siRNA motifs with the desired size and thermodynamic properties were designed. Then, in order to design hairpin, the proposed vector and loop sequences (TCAAGAG) submitted, so the most effective shRNAs with desired restriction enzyme sites were designed.

Results&Conclusion: Three potentially effective shRNA molecules were designed. Their sequences and start target positions included PPD

shRNA1:
CAAAAAGCCCTTAAATGCAACACTGAACTCTTGATTCAGTGTTGCATTTAAGGGCG , PPD

shRNA2:
CAAAAAGGGATTTATCGGAGACAACATCTCTTGAATGTTGTCTCCGATAAATCCCGand PPD

shRNA3:
CAAAAAGTGGTACGGAAGAATGTATCTCTCTTGAAGATACATTCTTCCGTACCACG with respectively start positions of 79, 737 and 1089 of avian borna virus virus G gene. The results showed that there are potentially effective shRNA molecules against Parrot bornavirus 1 Ggene that can suppress its translation and can be considered as an antiviral approach based on RNAi.

Keywords: shRNA, Parrot bornavirus 1, glycoprotein, gene therapy.

A case report on the effect of macrolides, tetracyclines and tiamulin antibiotics on the serum titer of Mycoplasma gallisepticum in a broiler breeder flock

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Objective: Mycoplasma gallisepticum is considered the biggest threat among poultry diseases, and the absence of this mycoplasma in day-old chickens is considered as the first important factor in the prevention and control of broiler diseases. The diseases mainly occurs in chickens and turkeys, but in Birds have also been reported as a disease and it causes chronic respiratory disease (CRD) and acute inflammation of the sinuses.

Materials & Methods:A total of 360 blood samples were taken from Broiler breeder Chickens of the Ross 308 breed at the ages of 25-28 and 31 weeks, respectively, at each time point using a 2 ml syringe, and RSAT and ELISA tests were performed on the samples. At the age of 25 weeks, the samples were negative in the RSAT test, but in the ELISA test with the BioCheck kit in MG, the frequency was 18, 4, 4, 6 respectively.The samples showed the titers of the groups as 1, 2, 3, 4. To control the contamination during three stages for 45 days with specific time intervals, Tilmycosin 25%, Tiamulin 12.5%, Doxycycline 10% by drinking water method and Tylosin phosphate 25%, Chlortetracycline 10% with the recommended dose in food was considered.

Result and conclusion: The results of this study show that the serum ELISA titer of broliarbreeder flocks infected with Mycoplasma gallisepticumshows a decrease after the start of the treatment. The most reduction was observed after the complete completion of the treatment protocols. Significantly reduced, but no one is able to remove it.Mycoplasma gallisepticumcan be present in the flocks with C.R.D symptoms and the infection can be transmitted among birds in a short period of timeand decrease in egg production andIncreased mortality is likely; Therefore, observing the biosecurity, standard capacity and density, and conducting regular monthly monitoring of broiler breeding flocks every 45 day is one of the most important factors in preventing and controlling the spread of disease.

Keywords: Mycoplasma gallisepticum, ELISA, broiler breeder, antibiotics

Comparing the traditional genotype 1 with the imported genotype 7 inactivated Newcastle disease vaccines in the challenge efficacy test with Iranian circulating virulent virus

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Introduction: Newcastle disease (ND), as a global threat to the world poultry industry, is a viral high contagious and rapid spread disease among chickens and other bird species. To control this disease, the vaccination using live and inactivated oily vaccines, is the most routine tool, with three main goals: 1) reducing or eliminating the occurrence of clinical disease; 2) reducing the rate of virulent virus shedding; and 3) increasing the minimum infectious dose of the challenge virus.

Aims: In recent years, some researchers have introduced the homogeneity between the ND vaccines used and the circulating viruent ND viruses (vNDV) as a very important factor in the control of ND. On this basis, the common heterologous vaccines are considered ineffective. Many studies have been done in this field and different results have been obtained. Since these researches were not based on the genetic differences between the vaccinal and the circulating viruses in Iran, therefore, in this study, for the first time, the effectiveness of two commercial inactivated ND vaccines belonging to genotype 1 and 7, which are widely used in the country, in terms of antibody response, protection and shedding rate in challenge with circulating genotype 7 vNDV are evaluated and compared.

Materials and methods Thirty 21-day-old SPF chickens were divided into 3 groups (10 chickens/group). Groups 1, 2 and 3 received a dose of routine inactivated vaccine made from genotype 1 virus, imported inactivated genotype 7 vaccine of and PBS (control) subcutaneously, respectively. After 21 days, all three groups were challenged with a characterized genotype 7 vNDV isolated from recent ND outbreak. The general conditions of the birds were reviewed daily. In order to shedding evaluation, on days 3, 5, 7, and 10 after the challenge, swabs were taken from the oropharynx and cloaca of all birds in each group. The presence of the virus in the samples was confirmed by virus isolation in 9-10 days SPF embryonated eggs and real time RT-PCR test.

Results and Discussion

In this study, the antibody response, the level of protection, as well as the percentage and amount of acute virus shedding for each of the groups were investigated and compared. The results of this study can be a serious benchmark for the effectiveness of ND heterologous and homologous inactivated vaccines used in Iran.

Isolation of Escherichia coli from the Yolk Sac of Day Old Chicks with their Antibiogramin Mashhad, Iran

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Objectives: Yolk sac infection (YSI) and colibacillosis are the most common infectious diseases that lead to high rates of early chick mortalities (ECMs) in young chicks.In this study, by referring to the Mashhad Veterinary Laboratory, one hundred chicks from different poultry farms sent to the Veterinary Laboratory, were examined and sampling was performed. All specimens without a history of antibiotic use were gradually transferred to a laboratory to be cultured from their yolk sac.

Materials and Methods: For this purpose, use MacConkey culture medium and eosin methylene blue to grow microbes.The morphological status of the microbe was examined by slide preparation and Gram staining. Also, using biochemical culture medium, indole and methyl red index were used to identify Escherichia coli bacteria. Then, antibiogram of the isolated strains was performed to determine the susceptibility and resistance of the microbes. For this purpose, the disk diffusion method was used by Kirby Bauer method and compared with standard drug disks. Finally, based on the results, the extent of microbial contamination and their drug sensitivity were determined.

Results: The results showed that 40% of the samples contained Escherichia coli and the highest microbial susceptibility to Ceftiofur and gentamicin drugs was observed, so that their sensitivity was 57.5% and 60%, respectively. The three drugs colistine, phosphomycin and lincomycin were 30% sensitive. Oxytetracycline, Sultrim, Erythromycin, Fluorophenicol, Tiamulin and Tylosin showed more than 90% drug resistance.Also, other antibiotics had different degrees of drug resistance and in addition, multidrug resistance has been observed in abundance.

Conclusion: Since the indiscriminate use of antibiotics has caused high drug resistance in chickens , it is necessary to minimize the occurrence of microbial contamination by observing hygienic conditions and appropriate disinfection. Also, the prescription of drugs should only be done by a veterinarian and based on the antibiogram.

Keywords:*Escherichia coli, Yolk sac infection, Antibiogram, Drug resistance*

Comparative evalution of the humoral immune response to newcastle disease vaccine and performance of broilers administered *moringa oleifera* pod, probiotic, levamisole and vitamin e/selenium.

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Natural substances are possible solutions to public health concerns on the use of synthetic antibiotic and growth promoters. This study evaluated the effects of *Moringa oleifera* pods (MOP) in comparison to probiotic, levamisole and vitamin E and Selenium on the growth performance and humoral immune response of broiler chickens. A total of 100-day-old ABOR-ACRE broiler chicks with the average weight of 38 grams were purchased from a hatchery in Ibadan and used for this study. The chicks were randomly divided into 5 groups (A, B, C, D and E). Group A was fed basal diet supplemented with of MOP powder at inclusion rate of 50g/kg, group B fed basal diet supplemented with commercial probiotic (Bactofort®) at 0.5g/kg, group C with commercial Vitamin E/Selenium (Vitamin E/Se® 100/50) in drinking water at 1ml/2litres for 3 days, repeated after 14 days, group D were given Levamisole (wormcare®) in drinking water for 3 days and repeated after 14 days, and group E served as control. Chickens in all groups were served same quantities of feed and water *ad-libitum*. Birds were vaccinated against Newcastle disease (B1 and la Sota live vaccines-IZOVAC(R)) on days 7, 14 and 28. The birds were weighed weekly and feed intake evaluated. Blood samples were collected through the brachial veins and sera tested using haemmagglutination inhibition (HI) test to assess humoral immune response to ND vaccination at 2 and 4 weeks post ND vaccination. Data were analyzed using simple descriptive statistics and two-way ANOVA. Results showed significant difference ($p < 0.05$) in weight gain of birds fed MOP and probiotic; also significant difference was recorded ($p < 0.05$) in immune response to ND vaccination in broilers fed MOP and vitamin E/Selenium feed. Broiler diet containing MOP powder could improve both live body weight as well as antibody response to Newcastle disease vaccination.

Keywords: *Moringa oleifera*, Immune response, Growth performance.

Effect of Mannan prebiotic and autolyzed *Saccharomyces Cerevisiae Yeast* on immune system and blood parameters of laying Japanese quail

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Objectives: In recent years, the livestock and poultry industry has sought to limit the use of antibiotics and encourage the use of non-antibiotic growth-promoting alternatives such as prebiotics, probiotics, organic acids, and bacteriophages to improve animal performance and human health using safe and natural products .This experiment was conducted to investigate the effect of different levels of prebiotic (KimiaMOScontaining: Mannan-oligosaccharides and β-Glucan) and yeast (NutriYeastcontaining: autolysis of Saccharomyces cerevisiae) on the immune response and some blood parameters of laying Japanese quail.

Materials & Methods: Two hundred 90days old laying Japanese quail were used in the study. The hens were allocated to 4 treatments, each containing five replicates of ten birds.A 2×2 factorial design was used to analyze data as a response to 2 levels of KimiaMOS (0.0 and 0.1 g/kg) and supplement NutriYeast (0.0 and 0.15 mg/kg) in the diet.At the end of the experimental period, 5 quails were randomly selected from each treatment and blood samples were taken to measure some blood parameters such as cholesterol, LDL, HDL and triglycerides as well as to evaluate immune response.Antibody titers were assayed by agglutination and were reported as log2 of the reciprocal of the last dilution at which complete agglutination was observed.

Results & Conclusion: Dietary supplement withprebiotic manan and autolysis of *Saccharomyces cerevisiae* reduced serum cholesterol in quails ($P < 0.05$).Serum cholesterol and total immunoglobulin levels were affected by the interaction effects of KimiaMOS and NutriYeast ($P<0.05$).The level of total immunoglobulin was affected by KimiaMOS supplementation ($P<0.05$).The inclusion of 0.1% of NutriYeastin the diet of laying quails did not show a significant effect on the level of immunoglobulin G and M ($P<0.05$). The simultaneous use of 0.1% mannan-containing yeast cell wallKimiaMOS and 0.15% autolysis yeast in the diet of laying Japanese quailshowed positive effects on serum lipids and bird's immune system.

Keywords: KimiaMOS, NutriYeast,immune response Japanese quail

Effects of Roasting Process on Some Antibiotic Residues and Quality Parameters in Chicken Meat

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Objectives:Poultry meat is rich in protein and is one of the fastest sources of meat production in the world. A variety of antibiotics are used in poultry farming for treatment and as growth stimulants.The presence of antibiotic residues in meat above the maximum residue limit(MRL) can cause health problems for consumers.So, it is important to use different processes to reduce or eliminate antibiotic residues, which can have different effects on the quality characteristics of meat.Thus, the present study aimed to evaluate the effect of the roasting process on the residual amount of commonly used antibiotics, along with its effects on cooking loss and color changes in chicken meat.

Materials & Methods: The chicken meat samples were prepared with the residues of three widely used antibiotics,includingenrofloxacin, oxytetracycline, and sulfadiazine, 4 times MRL. All samples were separately treated by roasting at 200 °C for 30 minutes.Then, the residual amount of each antibiotic was examined by high performance liquid chromatography (HPLC), and color changes and cooking loss of the samples were also assessed.

Results & Conclusion: The results showed that the effect of roasting treatment on the amount of antibiotic residues, cooking loss, and color indices were significant ($P<0.05$). The roasting processwas able to reduce at least 50% of the residual rate of each of the studied antibiotics.However, the highest reduction of antibiotic residues was observed in oxytetracycline residue by58.8%. Also, this heat treatment caused a significant cooking loss in the range of 55-58% in roasted chicken samples ($P<0.05$).Moreover, roasting treatment decreased L* indexand increased a* index, but b* index did not change significantly($P>0.05$). In general, it can be concluded that the applicationof roastingas a heat treatment can effectively reducethe antibioticresidues inchicken meat, but it will not be able to completely eliminate the antibiotic residues. Therefore, to minimize the effects of this thermal process on meat quality characteristicsand for further reduction of antibiotic residues, it is recommended to investigatenovel non-thermal processes and search for better methods.

Keywords: Antibiotic residue,Chicken meat, Colorimetry, Cooking loss,Roasting

Effect of Milk Thistle (Silybummarianum L.)SeedandExtract on Biochemical Parameters of Broiler Chicks Fed Aflatoxin B1 contaminated diet

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Objectives: This study was conducted to determine the efficacy of milk thistle seed (MTSs) and extract in reducing the negative effects of aflatoxin B1 (AFB1)on broiler chickens blood parameters.

Materials & Methods:240 one-day old chicks (Ross 308) for 35 days in a completely randomized design with six treatments, four replicates and ten birds per repetition were used. The experimental treatments included: 1) controldiet (negative control), 2) AFB1 contaminated diet (positive control) (500 ppb), 3) AFB1 + 0.5 %MTS, 4) AFB1+1.0 %MTS, 5) AFB1 + 600mg/kg MTE, 6) AFB1 + 1000mg/kg MTE.

Results & Conclusion: Statistical analysis of diets indicated no significant changes in uric acid, cholesterol, triglycerides, low density lipoprotein (LDL), high density lipoprotein (HDL), phosphorus andalanine aminotransferase (ALT)acompared to the treatments (P>0.01). Also, addition of 500 ppb of dietary AFB1 into the diet was associated with significant decreases in serum glucose, calcium and high density lipoprotein (HDL)and increased the activities of aspartate aminotransferase (AST) and alanine aminotransferase (ALT)compared to the control group (P<0.01). the addition of 1.0 % MTS and 1000mg/kg MTEto the contaminated diets decreased alanine aminotransferase enzyme compared to the contaminated control ($P \leq 0.05$).The results of this study showed that 1.0%MT plant powder was more effective in reducing the negative effects of feeding AF on broiler chickens blood parameters.

Keywords: Aflatoxin, Broiler, Blood parameters, Milk ThistleSeed

Evaluation of Efficacy and Safety of Canary Pox Vaccine of Ariana ImmenPattanAlborz Company

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Interduction:Canary pox is one of the most acute diseases of this bird with 100 %infection rate

And 80 to 1 % mortality. It has two main forms: cutaneous and mucosal. The disease is specific to canaries and there have been reports of disease in Melopsittacusundulatus, house sparrows and small green parrots.

Aim: fowl pox has been known for many years. At first, this disease was considered a separate plague from other diseases. In this study, an attempt has been made to introduce a safe and high-performance vaccine to reduce the concerns of canary owners. And also encourage the use of the above vaccine. Also reduce the spread and high mortality of the disease.

Methods:The virus was isolated by Aryana ImmenPattanAlborz Company and then the necessary tests and gravel of the virus were performed. Also, a safety test was designed and performed to check for immunity and safety.

Canaries are divided into three groups: The first group consists of twenty canaries in which only one dose of vaccine is injected into a bird's wing. The second group received twenty canaries, one dose per bird's wing and one dose in the form of eye drops. In the third group, or control group, ten birds were inoculated with only physiological serum on their wings.

Results:All birds showed swelling and inflammation except control group. All canaries showed a local reaction at the site of virus inoculation in the form of swelling and inflammation. They were monitored for up to sixty days. And they all survived.

Discussion and conclusion:The test results show the ability of the virus to multiply and function in the body and show no losses due to the non-pathogenic nature of the virus. Therefore, with the above tests, it can be clearly stated that the above vaccine is safe and can be used as a vaccine. Used safely and without stress in canary breeding farms.

Key words: canary pox, Immune, efficacy, Take

A survey of ostrich hatcheries sanitation (Entrobacterial and Fungal contamination) in Tehran Province

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Embryonic death is known as one of the most critical factors in financial loss of Ostrich farms. Bacterial contamination of fertile eggs is the most common cause of this problem. The majority of bacteria that were cultured from mortalities in ostrich hatcheries included the ubiquitous bacteria. Afew of these bacteria can cause inflammation in the reproductive tract and enter into eggs consequently. The aim of this research which has been done for the

first time in the country was to study the status of bacterial contamination of ostrich hatcheries.

Atotal of 120 samples in a weekly manner were collected from three ostrich hatchery units during a 3 month period. After disinfection of eggs' shells in laboratory, the eggs were opened at their air chambers area near the flame. Then, the dead embryos were dissected and samples were collected from different organs.

Detection of isolates was done using standard bacteriological techniques and based on their biochemical specifications.

Bacterial contaminations were detected in 56 (%46.6) out of 120 samples. More than one type of bacteria was detected in 25 (44.6%) contaminated samples. The status of observed bacteria insamples was as follows: Pseudomonas spp. (23.3%), Escherichia coli (20%), Klebsiella spp. (7.5%), Bacillus spp. (5.8%), Citrobacter spp. (5%), Staphylococcus spp. (5%), Proteus spp. (3.3%), Aeromonas spp. (0.8%), Enterobacter spp. (0.8%). No bacterial contaminations were deceted in 53.3% of 120 samples.

In conclusion, it is recommended to reduce the contamination of ostrich fertile eggs sufficient attention should be paid to the sanitary conditions and managerial standards in breeder flocks during collection and preservation of fertile eggs and in hatchery facilities.

Keywords: Ostrich, Embryonic death, Bacterial contamination

Evaluation of humoral and cellular immune responses of chitosan-based Newcastle nanoparticles vaccination with homokinin-1 molecular adjuvant

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Background and Aim: The global spread of Newcastle disease virus (NDV) in poultry has highlighted the need for improved immunization programs against the disease. In this study, the effect of hemokinin-1 (HK-1) as a biological agjuvant on the induction of humoral and cellular immune responses against chitosan-based NDV nanoparticles was investigated.

Materials and Methods: In this experimental study, , sixty SPF chickens were equally divided into six control and treatment groups. Control groups included received physiological serum, NDV inactivated antigen, and oil-adjuvantedNDV inactivated antigen; and treatment groups received chitosan, chitosan-based NDV nanoparticles, and the nanoparticles with HK-1. Based on the groupings, the chickens received each sample via eye drop on one day of age. Serum samples were collected at defined intervals and the humoral immune response was assessed by hemaagglutination inhibition (HI) test. Stimulation of the cellular immune response in different groups was assessed using cutaneous basophil susceptibility response (CBH).

Results: Addition of HK-1 to NDV nanoparticles increased the mean HI antibody titer compared to the group receiving nanoparticles alone. The difference in immune response between these two groups was significant (P <0.001). CBH test data showed a significant difference (P <0.001) in inducing cellular immune response in the groups receiving oil-adjuvantedNDV inactivated vaccine, nanoparticles alone, and the combination of nanoparticles and HK-1 with control groups.

Conclusion: Based on the data, chitosan based-nanoparticles with HK-1 adjuvant can induce specific humoral and cellular immune responsesagainst NDV.

Keywords: Newcastle disease, nanoparticle, hemokinin-1, chitosan, immune response

First report of *Erysipelothrix* species in pet birds in Iran

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Purpose: The aim of this study was to report the first isolation of *Erysipelothrix*sp. (ES) associated with clinical signs of diseases in companion birds of Iran.

Methods: We evaluated 89 pet birds (Pigeon, love bird, finch, Mina, cockatiels) from three provinces (west Azarbayjan, Yazd, Khozestan) for PCR to identify the microorganisms in different organs (Kidney, heart, brain, liver, trachea, lung).

Results: We have identified 2 (2.24%) as ES-positive pet birds. These isolates were from brain and trachea of two pigeons from Tabriz. Pigeons had gross lesions of swelling in liver and hemorrhage in brain with greenish diarrhea. There are not any positive samples in Yazd and Khozestan provinces. Other species of pet birds are negative, too.

Conclusion: This is the first study in Iran that addressed companion birds as carrier of erysipelas.

Antimalarial Drug Discovery of Natural Compound, Perovskone, with Semisynthetic Modifications

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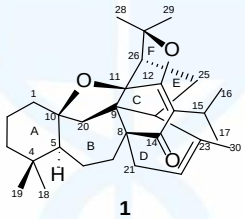
Objectives: Natural compounds, mostly from plants, have provided the best anti-malarials known to date. Here, in this project we explored the anti-malarial potential of semi-synthetic analogues of the lead Perovskone**1**. Since more than forty percent of world's populations are exposed to malaria, introducing such compounds, isolated as a main constitute from widely distributed Iranian medicinal plant *S. hydrangea*, may represent a new generation of anti-malarials compounds.

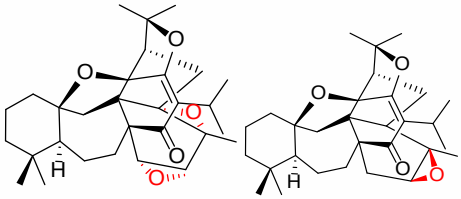


1

Materials & Methods: We isolated perovskone (**1**) as a major constituent of an n-hexane extract of *S. hydrangea*. 6 g pure of compound **1** was isolated from 15 kg dry plant. The antiprotozoal evaluation revealed that perovskone (**1**) is potent in vitro inhibitor of *P. falciparum*. In pursuing our aim to functionalize Perovskone**1** to increase its solubility and improve its biological activity, we decided to synthesize new derivatives of that. We synthesized 10 derivatives of compound **1**whichused different oxidazing agents and method to synthesis various derivatives such as epoxy, hydroxy, non-conjugated and conjugated dienes, etc.that can detectthe effect of different groups in different positions of the structure 1.

Results & Conclusion:Compounds 1-10 were tested for their *in vitro* antiprotozoal activity against *Trypanosomabruceirhodesiense*, *T. cruzi*, *Leishmaniadonovani*, and *P. falciparum*.

P. falciparum was generally found to be the most sensitive against all compounds. Compound **2** (IC_{50}=0.050µg / mL) exhibited two-fold higher activity than Perovskone**1** and compound **4** showed the best affinity (IC_{50} =0.014µg / mL) with fifteen-fold higher activity than **1** with the selectivity index (SI) of >100. These results suggest that the presence of additional cyclic ethers plays an important role in increasing the activity of the compound, especially the existence of the epoxy group at the D ring.



2 **4**

Keywords: Natural product, Perovskone, New derivatives, semi-synthesis, Antimalarial activity

A retrospective study of the pet bird cases referred to the veterinary teaching hospital of Shiraz University (2019 and 2021)

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Objectives: In recent years, keeping ornamental andpet birds has become more popular in Iranian people's culture. Due to the wide variety of petbird's species, the knowledge of their main diseasesand disorders has considerably contributed to the prevention and treatment strategies of these birds.

Materials and methods: In this study, 604 birds which were referredto the ornamental and pet bird clinic of Shiraz University were evaluated retrospectively. Bird species, involved organs and season were the main criteria for this study.

Results and discussion: In the years of 2018 and 2021, 26 birdspecies have been managed in this center which the most referred cases wasPsittaciformes (46.7%), Galliformes (23.8%), Passeriformes (17.1%), Columbiformes (8.6%), Accipitriformes (2.2%), and Strigiformes (1.7%). FromPsittaciformes, Cockatiel (48.5%) and African gray parrot (29.7%), andfrom Passeriformes, Mynahbird (56.3%) and Canary (22.3%) wereincluded the highest percentage of referred Psittaciformes andPasseriformes. In Psittaciformes, most of the referred cases had visited for digestive (20.6%), musculoskeletal (16.8%), respiratory (14.2%) and integumentarydisorders (9.6%). In addition, 21.6%of these birds referred to health checkup services and beak, nail and feather trimming. In Galliformes, respiratory (26.4%) and musculoskeletal disorders (22.9%) were most prevalent problems. In Passeriformes, musculoskeletal (36.8%), digestive (13.6%), nervous (11.3%), and respiratory disorders (6.8%) were the most refers cases and 7.8% of these birds were also referred for health checkup. In Columbiformes, digestive (30.8%), respiratory (26.9%), musculoskeletal (21.1%), and nervous (5.8%) disorders accounted for the most involved cases in this order. Musculoskeletal problems in Accipitriformes (70%) and Strigiformes (63.6%) were the most important reason for referral. In overall, most of the visited birdswith musculoskeletal and nervous disorders referred in winter. In contrast, digestive, respiratory and integumentary disorders were respectively prevalent in autumn, summer, and spring.

Conclusion: In this study, the yearof2020 were not investigated because of significantlyreduction of visits to the clinicintimes of the COVID pandemic. The number of referred cases to the veterinary teaching hospital of Shiraz University has increased (74.5 %) in the year 2019 compared to the year 2021which can reflect more people's attention toornamental and pet birds after the problem of COVID.

Keywords: retrospective study,veterinary teaching hospital,ornamental and pet birds, systemic disorders, season

Molecular characterization and antimicrobial resistance pattern of enterotoxigenic and enteroaggregative*Escherichia coli* isolated from broiler chickens in Ilam, Iran

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Objectives:*Escherichia coli*(*E. coli*) is one of the most important causes of bacterial infections in broiler flocks and is also one of the most important causes of diarrhea and infant mortality in all animals. In this respect, enterotoxin-producing isolates of this bacterium are particularly important among diarrheagenic*E. coli*. This study was carried out with the aim of genetic analysis of different enterotoxins and determination of antibiotic resistance pattern, as well as evaluation of virulence factors in *E. coli* isolates from broiler chickens samples in Ilam province.

Materials & Methods: In this study, a total of 275 nasal and cloacal samples from 20 different poultry farms in Ilam province, in Southwest of Iran were taken. The isolates were identified by specific differential media and standard biochemical tests. Using disk diffusion method, the sensitivity of the isolates to different antibiotics was determined, phenotypically. Tetracycline and erythromycin resistant strains were further confirmed by PCR amplification of *tetS* and *ermB* genes, respectively. The presence of heat-stable enterotoxin (ST)a- and STb, EAST-1and LT-encoding genes among *E. coli*strains was performed by PCR assays.

Results & Conclusions: The PCR results showed that out of 69 isolates of*E. coli*, 19 isolates (27.53%) harbored *astA*gene(encoding EAST-1), four isolates (5.8%) possessed the *LT* gene, and two isolates (2.9%) harbored both genes. None of the isolates were positive for*STa*or*STb* genes. Based on the results of disk diffusion test,the highest level of resistance was to tetracycline (n= 60,~87.0%) and erythromycin (n=57, 82.6%), respectively. All the tetracycline-resistant *E. coli* isolates but one (59/60, 98.3%) carried *tetS* gene and all the erythromycin-resistant isolateswere positive for *ermB* gene.Our study showed that colonization of broiler chickens with toxin-producing *E. coli* resistant to tetracycline and erythromycin is remarkably prevalent in Ilam province and can be a potential threat to human health and public health through chickens' meat consumption.

Keywords:*Escherichia coli*, Enterotoxigenic, Enteroaggregative, Antimicrobial resistance, broiler chickens

Sequencing and Phylogenetic Analysis of Hemagglutinin (HA) Gene of H9N2 Avian Influenza Virus in Iran

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Since its first detection in 1999, avian influenza virus (AIV) subtype H9N2 has been enzootic in Iran.Considering the high genetic variability of this virus and the effect of these changes on the effectiveness of used vaccines, this study was conducted for sequencing of the hemagglutinin (HA) gene and its phylogenetic relationship with H9N2 viruses in Iran and other parts of the world.

Methods:A suspected influenza sample was collected from a laying poultry in Zanjanprovince in 2018.After serological confirmation of influenza virus,HA gene of H9N2 virus was amplified by RT-PCR method. The PCR product was purified and the complete sequence of HA gene was determined by Sanger method. 65 HA gene nucleotide sequences from Iran and other countries were obtained from GenBankand their identity value was determined byBioEdit software. Phylogenetic tree withaligned sequences was drawn using the Maximum Likelihood method with MEGA-X software.

Results: The HA gene sequence from the Iranian isolate (A/chicken/Iran/chicken 21/2018(H9N2)) was registered in the GenBank.The HA gene sequence of this isolate has the lowest identity (81%) with the Iranian isolate from 2007 (A/mallard/Iran/T370/2007/H9N2) and the Iranian isolatesfrom 2017 and 2018, (A/Chicken/Yazd/RIV-6/2018/H9N2) and (A/Chicken/Mazandaran/RIV-5/2017/H9N2), had the highest degree of identity (99%) and (99.1%), respectively.

According to the phylogenetic analysis, the isolate obtained in this study had the greatest genetic similarity with other Iranian isolates in 2017 and 2018.It was also more closely related to isolates from Pakistan, India, and Iraq and less related to isolates from Tajikistan, Palestine, Egypt, and Russia.

Discussion and Conclusion:Avian influenza disease caused by H9N2 viruses is one of the important diseases of industrial poultry farms in Iran and many other countries.The phylogenetic analysis showed gradual and major changes in the HA gene sequence, so in order to review and organize the vaccination programs and choose the best type of vaccine to use in the country, survey and identify the genetic changesof this virus annually and compare it with other vaccine strains circulating in country, seems necessary.**Keywords:** Avian influenza , H9N2 , Iran , Phylogenetic analysis, Hemagglutinin(HA) gene

Cases of swollen head syndrome by pneumovirus and secondary infection by E.coli and gangrenous dermatitis in turkey

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Objectives: Swollen head syndrome (SHS) is a chronic disease affecting chickens and turkeys of all ages. Avian pneumovirus is a non-hemagglutinating, nonsegmented, enveloped single stranded RNA virus of the family Paramyxoviridae family. It is spread by airborne and mechanical routes (feed, water, and equipment). Immunosuppression plays a role, and E. coli is a common secondary invader.

Materials method:A turkey with nasal discharge, foamy conjunctivitis, swelling of infra-orbital sinuses and necrosis of skin above the head was referred to the pathology department of faculty veterinary medicine of Urmiauniversity.Postmortem examination was performed in turkey showing signs of SHS. The trachea and head from turkey was collected for laboratory investigation. An enzyme-linked immunosorbent assay (ELISA) was used for the detection of viral antigen in the trachea, and bacteriologic and histopathological examinations were performed from the wound of the head.

Results & conclusion:According to the ELISA results, the most frequently detected antigen in the trachea waspneumovirusand examinations from the wound of the head resulted in the isolation of Escherichia coli. Histopathological examinations from skin of the head showed necrosis and infiltrationof inflammatory cells especially neutrophils and macrophages.

Keywords: swollen head syndrome, pneumovirus, E. coli, gangrenous dermatitis, turkey

Incidence of microbial contamination in poultry products of Kerman Province

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Introduction: Foodborne bacterial infections associated with consumption of poultry remain of great importance worldwide due to economic and public health effects. Pathogenic and indicator bacteria have been shown to survive in frozen foods for extended periods.

Methods: A total of 20 random samples of frozen marketed broiler chicken carcasses were collected in Kerman province, southern Iran. The samples were then subjected to microbiological examination for incidence of aerobic and enterobacteria.

Results: Results are shown in the table below:

	A (CFU/gr)	E
1	103×5/1	Negative
2	102×1	Negative
3	102×5/3	Negative
4	103×5/5	Negative
5	102×4	Negative
6	103×5/1	Negative
7	102×6	Negative
8	102×5/7	Negative
9	103×5/3	Negative
10	102×5/5	Negative
11	102×5/1	Negative

12	102×5/2	Negative
13	103×4	Negative
14	102×2/1	Negative
15	102×6	Negative
16	102×5/2	Negative
17	102×3/5	Negative
18	102×4	Negative
19	102×5/1	Negative
20	102×2	Negative

From the above, four representative isolates were subjected to further identification. Of these, 3 isolates were gram-positive spore-forming bacilli with slight morphological variations, and 1 isolate was found to be a gram-positive, catalase-positive, coagulase-positive coccus.

Discussion: The results are useful for assessment of microbiological contamination risk in poultry meat in Iran and provide valuable information for future national food control policies.

Keywords: Microbial Contamination, Poultry, Kerman Province

Occurance of halophilic bacteria in poultry products

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Introduction: Halophilic bacteria have attracted a great deal of attention in the modern era. It is because they contain enzymes that can be used in food processing, environmental bioremediation and biosynthetic processes under harsh ionic strengths.

Methods: Three gram-positive spore-forming bacilli and a gram-positive coccus isolated from market broiler sources, were examined for their salt tolerance in a routine quest for halophilic bacteria. BHI medium was supplemented with salt concentrations of 2%, 6.5%, 10%, 25%. The cultures were started with the least salt concentration (2%), positive isolates were then subjected to higher concentrations, stepwise.

Results: The gram-positive spore-forming bacilli grew only in BHI medium with 2% salt concentration and the gram-positive coccus tolerated BHI medium with 2% and 6.5% salt concentrations. Samples were preserved for further analyses.

Discussion: The above results indicate no halophilic bacilli and a moderate halophilic coccus. Future studies are necessary for identification of the isolated microorganisms and assessing their potential application in the treatment of saline and hypersaline wastewaters. Many of these processes have yet to be fully exploited, nevertheless the future use of halophiles in biotechnology provides a positive outlook.

Keywords: Halophilic, Bacteria, Poultry products

Psychrophilic bacteria isolated from poultry sources

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Introduction: Bacteria tolerating or favoring low temperatures can provide enzymes that work efficiently in reduced temperatures. Such bacteria are called psychrophiles and their enzymes psychrozymes. In the food industry, psychrophilic enzymes have potential uses in flavor enhancement of frozen meat, casein degradation in dairy products, improving stability and solubility of health foods and many other food-processing applications.

Methods: A gram-positive coccus and three gram-positive spore-forming bacilli isolated from market broiler sources, were tested for their ability to grow at low temperatures in a routine search for psychrophilic bacteria. BHI broth containing 1% lactose was prepared. Then a loopful of each pure isolate was placed in the culture medium and placed at 4 degrees and intermittently hand-shaken for 14 days. Finally, 100 µL of broth samples were cultured on BHI Agar containing 1% lactose.

Results: Two spore-forming gram-positive bacilli and the gram-positive coccus showed positive growth at 4°C. On the other hand, one of the gram-positive sporulating bacilli did not grow at this temperature.

Discussion: The tree psychrophilic isolates were obtained hereby raise a great hope to provide a good source for psychrozymes. Enzyme isolation and further catalytic assessments and application evaluations are sought for future steps.

Keywords: Psychrophilic, Bacteria, Poultry

Welfare in captive wild birds

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Objectives: There are probably more than 10,000 zoos worldwide, with thousands of animals held captive. There is an increasing concern about keeping wild animals captive. Animal welfare is a priority across accredited zoological institutions; however, historically, research has been prioritized for mammals. Bird-focused studies accounted for less than 10% of welfare research in zoos over the last decade. Since birds are kept in zoos significantly more than mammals, this lack of research has been addressed. The concept of the Five Freedoms was originally set out as a tool for assessing the welfare of farmed animals, but it can be applied to captive birds kept for any reason. In order to apply the principles objectively in aviaries, however, they have to be seen in the context of how birds live, how they adapt to change and the effect of stressors and other stimuli on birds. Some specific hypotheses may arise from speculating about natural behavioral needs (such as “does restricting flight affect bird welfare?”). Morphological adaptations have allowed birds to utilize flying as part of their primary locomotion. However, birds in captivity are often deprived of this natural behavior due to limited space. Within zoos, welfare practices increasingly focus on fulfilling individual animal interests. However, they fail to recognize the intrinsic value of individual animals beyond being members of species.

Materials & Methods: This research is a review study in which articles published in authentic databases such as Scopus, ScienceDirect, Google Scholar and PubMed and also library search were used. The terms “Welfare”, “Captive Bird”, “Wild bird” and “Zoo Animal” were used to search in English sources.

Results & Conclusion: There are countless links between animal welfare, human well-being, conservation, biodiversity and the environment. In the development of legislation on animal welfare, many national governments and international organizations rely on multi-disciplinary animal welfare science in addition to broad animal welfare principles. On the other hand, behavioral monitoring using technology (such as leg bands) can provide information on space use, nocturnal activity, morphology, fear and pain, feed intake, locomotive patterns to detect health issues, early warning signs of harmful behaviors, and improve husbandry and reproductive output. The five freedoms encompass the basic needs of animals and, if they are applied, they should ensure an adequate level of welfare. Future welfare research in zoos should prioritize studies that consider a diversity of bird species and work to identify animal-based measures with empirical evidence.

Keywords: Welfare, Captive, Wild birds, Zoo animals, Natural behavior, Five Freedoms

The welfare in broilers

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Objectives: Over several decades, animal welfare has grown into its own free-standing field of scientific study. Animal welfare pertains to the individual and how it perceives its life in terms of avoiding negative physical and mental experiences, as well as having access to what they want and need. It is not limited to good health and physical condition, but also includes good mental well-being and the ability to perform behaviors that are characteristic of the animal in question. The general concept of poultry welfare embraces a continuum between negative welfare and positive welfare. For broilers, welfare includes pecking, scratching, wing-flapping, perching, and running.

Materials & Methods: This research is a review study using relevant articles and sources in Scopus, PubMed, Science Direct and Google Scholar databases and also library search were used. The terms “Animal welfare”, “Poultry industry”, “Broiler chickens” and “Poultry welfare” were used to search in databases.

Results & Conclusion: Chickens particularly bred for meat production are called broiler chickens (also named broilers). Genetic selection and improved nutrition have been used to increase the weight of breast muscle and faster growth rates. This has had implications for the quality of life, health, walking ability of broilers and metabolic problems such as ascites. One of the welfare issues specific to fast growth rate is contact dermatitis. The inflammation caused by prolonged contact among the birds’skin and wet and dirty litter. There are welfare issues specific to high stocking densities such as reduced ability to exhibit natural behaviors, restricted movement and poor environment. Pollution, wet litter and higher temperatures are all a problem due to the increased biomass. Limiting stocking densities without adequate control over the environment will therefore not automatically lead to the expected improvements in welfare. The health and welfare of broilers is compromised at stocking densities above the range 34 - 38 kg per square meter. Also Welfare issues specific to environmental conditions are poor air quality, ventilation, heat stress and reduced litter quality. The welfare of birds may be compromised by chronic exposure to aerial pollutants such as ammonia, dust and pathogens, as these can be damaging to the eyes and respiratory system. These pollutants originate from the feed, the litter and the chickens themselves. High levels of humidity can lead to more birds dying over the growth period. Adequate ventilation provides the most effective method of controlling humidity within house.

Keywords: Welfare, Poultry industry, Broiler chickens, Meat production

Response of broiler chicks to decreasing dietary nutrients concentration and increasingsteps of feedingphase program

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Objectives: It is well-documented thatthe nutritional requirements of modern broiler chicksto different nutrients,changeby increasing birds age over the growth period. Feeding phase program is a nutritional strategy in order to provide sufficient nutrients with respect to birds age that can lead to enhanceflock performance. The aim of current study was to evaluate the influence of various concentrations of dietary energy, protein and other nutrients, and also the number of multiphase-feeding periods on growth performance of commercial broilersfrom one to forty days of age (DOA).

Materials &Methods: In a completely randomized design (CRD), 300 one-day-old male broiler chicks (Ross-308, Aviagen®) were allocated to 20 experimental units, including 4 treatments and 5 replicatesof 15 birds each, using a 2×2factorial experiment. The dietary factors were consisted 2 levels of nutrients concentration in diet [recommendedlevel by Aviagen (control group) and a 5%-diluted diet], and also 2 types of phase-feeding program[3-step (control group, recommended byAviagen; 1–10, 11–24, and 25–40 DOA) and 5-step (1–8, 9–16,17–24, 25–32, and 33–40 DOA)].The *ad libitum*experimental diets were formulated with similar nutrients. Birds average daily feed intake (ADFI), average daily weight gain (ADWG), feed conversion ratio (FCR), and mortality were measured during the trial.A two-factor ANOVA was applied for datastatistical analysis using the GLM procedure ofSAS software,and LSD test was performed for means separation at $P \leq 0.05$ significance level.

Results & Conclusion: There were no significant interaction between experimental factorson birds'growth traits. Broilers body weight, ADWG, and mortality did not affect by nutrients concentration and phase-feeding program. The birds fed diets by the recommended level of nutrients showed an improvement in FCR compared to those reared by diluted diet (+6.96%, $P < 0.05$). Phase-feeding program had no significant effect($P > 0.05$) on measured parameters; however, using the 5-step of feeding program resulted to numerical improvement of birds FCRby 1.82%,throughout the trial. From the information of this study, it can be concluded that a5% dilution of dietary nutrientsdecreased the growth performance of broiler chickens. Moreover, 5-step feeding program in comparison with common commercial 3-step feedingperiodcannotimprove the growth performance of broiler.

Keywords: Broiler, Nutrient concentration, Phase-feeding, Performance, Feed conversion

Phylogenetic groups and virulence genes in *Escherichia coli* isolates from retail turkey meat

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Objective: The aim of the study was to determine the virulence genes of *Escherichia coli* (*E. coli*) isolates from retail poultry meat to evaluate the possible link to foodborne urinary tract infections in human.

Materials & methods: Thirty *E.coli* isolates from retail turkey meat were analyzed for some virulence genes. Phylogenetic group were determined by triplex PCR by detection of genes including chuA, yjaA and TSPE4.C2. A multiplex PCR panel targeting five genes that most significantly associated with avian-pathogenic *E. coli* (APEC) (iutA, hlyF, iss, iroN, and ompT) was used to screen isolates. Likewise, Four virulence factor-encoding genes, yfcV, vat, fyuA, and chuA, which highly associated with uropathogenic *E. coli* (UPEC) strains were examined.

Results and conclusion: The results of study showed about 76.7, 20 and 3.3 percent of isolates fall into phylogenetic group B2, A and D, respectively. Twenty-five percent of isolates were positive for four virulence genes UPEC and 30 percent of isolates were positive for five APEC genes. Extraintestinal pathogenic *E.coli* (ExPEC), defined by isolation from infections outside the intestinal tract, includes (UPEC), (APEC). Within the ExPEC classification, uropathogenic *E.coli* strains are able to cause urinary tract infections (UTIs). Based on previous studies, specific subset of *E.coli* capable of withstanding decontamination steps during meat processing may continue to remain on poultry meat as retail poultry *E.coli*. APEC bacteria typically present in the intestine of poultry and passed through feces resulting in a boarder dissemination via contamination of the environment, including water and poultry litter.

The current research suggested APEC bacteria has ability to induce UTIs and poultry meat can transfer pathogenic bacteria to human food chain. Additional research is necessary to confirm a link between APEC and human UTIs.

Key words: UPEC, APEC, Poultry, Meat, *E.coli*

Unexpected increasing quinolone resistant *E. coli* isolatesinpoultry carcasses referred to veterinary laboratories in Semnan, Iran

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Objective: Resistance to quinolones is particularly troubling because they are broad-spectrum antibiotics used to treat serious bacterial infections.Quinolone and FQ resistant *E. coli* isolates from broilers, broiler meat and humans are closely related and show clonal links, indicating that poultry and their food products can be a source of resistant *E. coli* in humans.Due to the lack of comprehensive information on the sensitivity or resistance to common quinolone antibiotics used in poultry industry in Semnan, the purpose of this study wasto determine and compare thequinolones resistance of *Escherichia coli* isolated from poultry carcasses in Semnan, in two time periods of 2017 and 2022.

Materials and Method: Totally resistance of 170*E. coli* isolated from poultry colibacillosis in Semnan (100 isolates were collected in 2017 and 70 isolates were obtained in 2022) to nalidixic acid (30µg), ciprofloxacin (5µg), enrofloxacinand, ofloxacin (5µg) were investigated using the disk diffusion method in Mueller-Hinton agar following Clinical Laboratory Standards (CLSI) guidelines.

Results & Conclusion The results of this study showed that the resistance to quinolones is high and this rate has increased in recent years.So that the resistance to enrofloxacin increased from 48% to 71% and the resistance to ofloxacin, ciprofloxacin and nalidixic acid increased from 20%, 30% and 46% to 72%, 74% and 74%, respectively.The results conclude by stressing that the rising incidence of quinolone resistant *E. coli* isolates from chicken sources may increase the potential risk of antibiotic resistant *E. coli* acquisition by humans.Therefore, in order to achieve a suitable strategy for the treatment of bacterial diseases, it is necessary to continuously monitor the profile of antibiotic resistance in each region.

Key words: *Escherichia coli*, colibacillosis, quinolone resistance

Investigating the prevalence of Newcastle Disease and Avian Influenza in Semnan broiler flocks

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Objectives: Respiratory diseases in poultry due to Newcastle Disease (ND) and Avian Influenza (AI) cause constant mortality in broilers. In recent years, despite national and domestic prevention and control measures against AI and ND, coupled with widespread usage of diverse vaccines, outbreaks of these viral diseases still cause respiratory syndromes in broiler flocks and constantly created challenges in poultry farming; moreover, brings many health and economical damages annually. By considering that Semnan province is one of the poultry industrial hubs in Iran, our research has been done aimed at investigation of these two diseases.

Materials & Methods: In this research, 14 broiler breeding farms located in Semnan, Sorkheh and Mahdishahrfrom February 2021 to October2022 were randomly investigated in terms of the involvement in ND and AI. This research is based on the ND and AI antibody titers detected by hemagglutination inhibition (HI) examination, for which we have approached related governmental and private veterinary sections.

Results & Conclusion: All the studied herds suffered from respiratory complex and the mortality rate was high.From 14 investigated units, 7 of them (50%) had involved in Newcastle and also 7 out of 14 flocks (50%) had gotten involved in AI virus. We also regarded that the prevalence of ND and AI mostly occurs in summer; for ND 57.14% and for AI 71.42%. In addition, the examination of the antibody titer against these two viruses showed that 21.42% of the herd were infected with both viruses. Given the fact that all reviewed farms had taken necessary vaccines according to routine schedule, the review of vaccination plans of affected flocks every year and paying attention to the reasons of occurrence of these two diseases seems to be needful and should be noticed by the relevant authorities.

Keywords: Newcastle disease, Avian influenza, Broiler Flocks, prevalence, Semnan

Evaluation of *bla-tem*, *bla-shv*and *oxa*resistance genes in esbl producing avian pathogenic *escherichia coli* strain

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Objectives:*Escherichia coli*bacteria is the most abundant organism in the digestive system of humans and animals. The most important microbial flora is in the end part of the intestines of birds. Most isolates are not pathogenic, but some serotypes cause disease. The most important disease caused by ***Escherichia coli***pathogenic strains of poultry is septicemia. The main form of the disease in poultry and often infects meat poultry. It causes losses and economic losses in the poultry industry. The creation of bacterial resistance and the indiscriminate use of drugs over many years have multiplied the problem of controlling and treating this disease. The aim of the current study were evalution avian pathogenic ***Escherichia coli***strains by multiplex PCR and determine their susceptibility profile.

Material and Methods: In this study, 50 isolates of pathogenic ***Escherichia coli*** from 2011 and 50 isolates of pathogenic ***Escherichia coli*** from 2020 were examined. After isolating the samples, they were examined for the presence of genes using multiplex PCR technique and the antibiotic susceptibility test was determined using the disk diffusion method agreeing with CLSI guideline.

Results: The antibiotic susceptibility test results showed that, the highest resistance rates were related to Sulfamethoxazole- Trimethoprime (90%) and Tetracycline (90%) and the lowest resistance rate was related to colistin (4%) and in the isolates related to the year 2020, the highest resistance rete was related to Chloramphenicol (86%) and the lowest resistance rate was related to Aztreonam (4%). In phenotypic determination ESBL test 100 isolates of (2011-2020) it was found which is 4% of the definite resistance, 7% relative resistance and 36% probable resistance to ESBL. The results of gene evaluation related to the year 2011 showed that in 50 isolated, *TEM* was found in (52%) and *OXA* in (2%) of the isolates and in 50 isolates related to the year 2020, *TEM* was found in (32%) and *OXA* in (2%) of the isolates *bla-SHV* gene (0%) was not found in any of the samples.

Key Word:*Escherichiacoli*, resistance, Extended-Spectrum Beta-Lactamase (ESBL), APEC, Multiplex PCR

Alternatives to killing day-old male layer chicks

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Objectives: Day-old male layer chicks are killed in the hatchery, which poses animal welfare and ethical problems.In this research, we decided to find alternatives to the old method of killing male layer chickens and compare them with each other and ultimately, introduce the best of them.

Materials & Methods: In this article, reliable databases such as Scopus and Google Scholar were used, for searching in foregoing databases, the statements ‘Male layer chick culling’, ‘Male layer chick maceration’ and ‘Male layer chick gassing’ were used and articles related to this issue were extracted and studied.

Results & Conclusion: Alternatives ‘Dual purpose chicken’ and ‘Fatterning of laying hen brothers’ do not have any economic justification and morphometric studies on the outer shape of the eggshell had no results, the best way to stop killing day-old male layer chicks is defined as ‘in ovo sex determination’ which subdivides to different methods such as ‘genetic engineering’, ‘molecular sexing assays’ and ‘imaging methods’. In ovo sex determination methods have the potential to end the culling of male layer chicks.

Keywords: Male layer chick maceration, Male layer chick culling, killing day-old male layer chicks, Male layer chick gassing, Dual purposechicken

Age related changes in follicle stimulating hormone, luteinizing hormone, estradiol and egg production of layer quails

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Objectives: Egg-production reflects the overall reproductive performance of laying breeder. The main endocrine factors that regulate egg-laying are follicle-stimulating hormone (FSH), luteinizing hormone (LH) and estradiol hormone. In the last decades, many studies have explored the effect of age on egg-laying performance in the breeders, but a few reports explained the correlation the endocrine disrupting with increasing aging in laying breeder quails.This study was conducted to compare the egg production performance and the circulating levels of estradiol, testosterone, progesterone, luteinizing hormone (LH) and follicle stimulating hormone (FSH) in three groups; 4-10 week-age, 9-17 week-age and 52-62 week-age of breeder quails.

Materials &Methods: Twenty-Eight laying breeder Japanese quails with 4, 9 and 52 weeks old (totally, 84 birds) were reared for 6, 8 and 10 weeks respectively. Egg production (daily-recorded) were evaluated per age. Collected blood samples (1.5 mL blood; seven samples for each age) through wing vein in tubes that impregnated with EDTA centrifuged at 3000 g for 10 min and plasma stored at 20 ^{0}C. LH, FSH, estradiol and testosterone concentrations in the plasma were measured by ELISA (optical density at 450 nm). Data were analyzed using analysis of variance (ANOVA) following the general linear model procedure of SAS. Treatment means were separated by Duncan's post-hoc test.

Results: The rate of egg production was reduced by increasing of age after 17 weeks age. Older hens which remained in lay produced fewer but higher eggs than the younger birds. The circulating levels of estradiol, testosterone, progesterone and FSH were found to be significantly elevated with age. Mean LH levels in the 62-week age group were significantly lower when compared to age groups 10-week and 17-week (P less than 0.05). Elevated follicle-stimulating hormone/luteinizing hormone ratio ≥4.5 is associated with low egg production in 62-week age group but FSH/LH ratio≃2.5 corresponds to the peak production in 17-week age.

Conclusion: This study demonstrates that the young birds or in peak of production that may have no hormonal imbalances yet but the aged birds had the high imbalances in hormonesduring the late laying period.As age increased, average estradiol levels exhibited a linear increase and the elevated follicle-stimulating hormone/luteinizing hormone ratio is associated with low performance in aged breeder quails. Keeping the FSH/LH ratio constant at around 2.5 can be considered as a functional index for persistency of egg production in layer breeders.

Keywords:FSH/LH ratio, persistency of egg production, ageing, egg production performance

Surveillance of common respiratory diseases in broiler flocks in Iran

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Objectives: The purpose of this study is to investigate surveillance of common respiratory diseases in broiler flocks in Iran.

Materials & Methods: In the Iranian provinces ofLorestan, Kordestan, Kerman, Yazd, Khorasan, and Ilam, 52 broiler flocks with an overall capacity of 1520000 were evaluated during a period of two years (2020–2022).During the study period, serological data including Elisa of infectious bronchitis (IB), Hemagglutination inhibition (HI) test for avian influenza (AI), and Newcastle disease (ND) at slaughter age were recorded.

Results & Conclusion: Our data revealed that flocks that got 6 doses of ND live vaccination had considerably higher HI titers than flocks that received 4 live ND vaccine (P<.05). In addition, the HI titer of AI was much greater in winter than in summer and spring (P<.05).In compared to other flocks, those that received AI inactivated vaccination had a higher average HI titer. Despite the fact that flocks that did not get AI inactivated vaccine were predicted to have very low HI titers, the average HI titer in these flocks was 3.11 ± 1.42. There was no statistically significant difference in IB Elisa titer between flocks that received 3 IB live vaccinations and flocks that received 2 live IB vaccines (P>.05). Finally, the present study showed the different consequences of various immunizations (vaccination) in the management of major respiratory infections of broilers.

Keywords: Respiratory diseases,Infectious bronchitis,Avian influenza, Newcastle disease,Broiler flocks

Investigating the synergistic effect of ginger powder and frankincense extract on performance and blood lipid factors in broiler chickens at the age of 42 days.

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Objective: This study was conducted to evaluate the synergistic effect of ginger powder and frankincense on performance and blood lipid factors in broiler chickens at the age of 42 days.

Materials and methods: Two hundred one-day-old comercial broilers were randomly assigned to ten exprimental diets were formulated to have four levels of ginger powder (0, 2%, 3% and 4%) gr/ kg withfour levels of frankincense extract (0,0.2%, 0.3% and 0.4%) gr/kg of diet. The one-day-old Ross 308 broiler chickens were randomly divided into 20 exprimental pens, 10 chickens in each pen and each dietwasoffered to five replicates.

Results: The results in this study showed that in compares with control group, the group with 4% gr/kg ginger and 0.4% gr/kg frankincence extract significantly ($p<0.05$) increased the final live wieght and improved wieght gain at 42day old chickens. Dietry treatment significantly ($p<0.05$) affected the carcass parts and organs development of broiler chickens. However ginger powder and frankincence extractinfluenced on serum cholestrol, triglycerid and abdominal fat of the chickens related to control. In conclusion ginger powder and frankincence extract could be used as antilipidic agents in broiler diets to have lower serum cholestrol, triglycerid and abdominal fat with no growth reduction.

Keywords:ginger powder, frankincence extract, serum lipid, final live wieght

Evaluation of a lytic bacteriophage to treatment of colibacillosis in broiler chickens in East Azerbaijan, Iran

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Emerging antibiotic-resistant bacteria has been explained as a critical concern in medicine and veterinary medicine recently. Also transferring the antibiotic resistance genes from animals to humans is confirmed previously. Therefore, finding new and effective alternatives to antibiotics is inevitable. Bacteriophages (phage therapy) was successfully used to remove and treatment of different infections in humans and animals.

In this study 50 antibiotic resistant isolates of *E.coli* from clinical cases of poultry colibacillosis were isolated and confirmed using 16srRNA gene detection in East Azerbaijan, Iran. A lytic bacteriophage was isolated against the most resistant pathogenic isolate as host using agar bilayer method. Host range of the bacteriophage was evaluated against all used isolates and then, its morphological and biological features was determined. In experimental assays, antibacterial activity of the bacteriophage was evaluated in different groups of broiler chickens comparing with ciprofloxacin.

According to the results, the phage was classified in *Podoviridae* family and it was named PEcMa6/19. The phage showed stability in temperature range of -80 to 60 ℃.It can survive in pH rate of 2-12 but it was sensitive to ethanol, DMSO, acetone and SDS. In experimental phase, in antibiotic treatment groups immediately, 24 h and 48 h after bacterial injection, rate of mortality among chickens were 20, 16.6 and 23.3 % while in phage treatment groups theses rates were determined 6.6, 13.3 and 13.3% respectively. Our results confirmed the high antibacterial potential of bacteriophage PEcMa6/19 to control of colibacillosis but for expanded application in poultry flocks molecular analysis of the bacteriophage is needed.

Key words

bacteriophage, broiler, bacterial disease, antibiotic resistance, colibacillosis

Comparison of immunogenicity of two commercial Gumboro vaccines in broiler flocks

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Infectious bursal disease(IBD),also known as Gumborodisease is one of the most common diseases among young chickens,characterizedby immunosuppression and mortality generally at 3 to 6 weeks of age. As a result of this disease, even poultry vaccination for other diseases can be ineffective. Vaccination of chickens, especially before the age of three months, is one of the necessities of combating against this disease. Breeder flocks may be immunised against IBD so that they would transfer protective antibodies to their progenies, such as broiler and pullet chicks.Also, vaccination reduces the threat of this disease in broilerflocks.The aim of this study was the comparative evaluation of the humoral immune response of live attenuated Gumboro IBD-AVIVAC and MSD-D78 vaccines that are available in the Iranian market.

Materials and methods: After determining the maternal titer and calculating the vaccination time, the vaccines were given in one stage at the age of 18 days and the second stage at the age of 24 days to two halls of a broiler farm that had a capacity of 9000 birds of the ROSS 308 breed. Then, blood sampling was done from 25 chickens in each hall, at the ages of 3-10-19-30-40 days of breeding and ELISA test was done with BioChek kit. Also, clinical manifestations, molecular tests and functional parameters (death trend, average weight, feed consumption, food conversion ratio of different groups) were recorded.

Results:The average antibody titers on 1, 30, and 40 days after vaccination with MSD-D78 vaccine were 888, 3277, and 4444, respectively, and after vaccination with IBD-AVIVAC vaccine, they were 897, 3544, and 4699, respectively. The average antibody titer in the ELISA test at different ages of the study was in the same and similar titer groups, and no difference was observed in their values. Also, the values of titers obtained from vaccination at the age of 30 and 40 days were within the expected range. Also, the results of the ELISA test at the age of 30 and 40 days had the Vaccination Index (VI) in the specified range of the vaccine and not the challenge with the pathogen, clearly in the range of 100-400. The results of molecular tests, clinical observations and optimal performance of herds also confirmed the absence of any exposure to Gumboro disease.

Conclusion:In the review of the results obtained in this study, it was found that providing the IBD-AVIVAC vaccine by oral method in broilers, like the MSD-D78 vaccine, has the ability to stimulate humoral immunity detectable in the ELISA test against Gumboro disease.

Keywords: Vaccine, Gumborodisease, Infectious bursal disease(IBD), broilers, ELISA test, Iran

Sequencing and Phylogenetic Analysis of Neuraminidase gene of H9N2 Avian Influenza Virus in Iran

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Avian influenza virus (AIV) subtype H9N2 **causes severe respiratory disease in poultry farms and occasional respiratory disease in human.**Since its first detection in 1999,H9N2 has been enzooticin Iran.Considering the high genetic variability of this virus and the effect of these changes on the effectiveness of used vaccines, this study was conducted for sequencing of the **neuraminidase** (NA) gene and its phylogenetic relationship with H9N2 viruses in Iran and other parts of the world.

Materials & Methods:A suspected influenza sample was collected from a laying poultry in Zanjanprovince in 2018.After serological confirmation of influenza virus, NA gene of H9N2 virus was amplified by RT-PCR method. The PCR product was purified and the complete sequence of NA gene was determined by Sanger method. 60 NA gene nucleotide sequences from Iran and other countries were obtained from GenBankand their identity value was determined byBioEdit software. Phylogenetic tree withaligned sequences was drawn using the Maximum Likelihood method with MEGA-X software.

Results: The NA gene sequence from the Iranian isolate (A/chicken/Iran/chicken 22/2018(H9N2)) was registered in the GenBank.The NA gene sequence of this isolate has the lowest identity (81%) with the Iranian isolate from 2007 (A/Chicken/Iran/SH2/2007/H9N2) and the Iranian isolatesfrom 2017 and 2018, (A/Chicken/Hamadan/RIV-1/2017/H9N2) and (A/Chicken/Kermanshah/RIV-10/2018/H9N2), had the highest degree of identity (98.2%) and (92.7%), respectively.According to the phylogenetic analysis, the isolate obtained in this study had the greatest genetic similarity with other Iranian isolates in 2017, 2016 and 2013.It was also more closely related to isolates from Pakistan and Iraq and less related to isolates from Tajikistan, Japan and China.

Discussion and Conclusion:Avian influenza disease caused by H9N2 viruses is one of the important diseases of industrial poultry farms in Iran and many other countries.The phylogenetic analysis showed gradual and major changes in the NA gene sequence, so in order to review and organize the vaccination programs and choose the best type of vaccine to use in the country, survey and identify the genetic changesof this virus annually and compare it with other vaccinal strains circulating in country, seems necessary.

Keywords: Avian Influenza, H9N2, Iran, Phylogenetic analysis,Neuraminidase **(NA) gene**

Comparison of immunogenicity of two commercial Infectious Bronchitis vaccines in broiler flocks

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Infectious bronchitis is a contagious viral respiratory disease in chickens, which is important because of the costs associated with drug treatment, losses and removal of carcasses. In the absence of proper immunization, this disease can cause up to 30% mortality in broiler flocks. It is very important to have proper immunization using common vaccines in the country. This study was carried out with the aim of comparative evaluation of the humoral immune response of live attenuated vaccines AVIVAC-IB VARIANT STRAIN A/91 and MSD-4/91 available in the Iranian market.

Materials and methods: Two halls were selected from a broiler farm, each of which had a capacity of 9000 birds of the ROSS 308 breed and had the same management and nutrition. Two stages of infectious bronchitis vaccine (serotype 793/B), at the ages of one day and fourteen days (respectively, two stages of vaccination with A/91 vaccine from AVIVAC company in Hall number 1 and two stages of vaccination with 4/91 vaccine from MSD company in Hall number 2, respectively, were presented with spray methods on the first day and eye drops on the fourteenth day. Then, blood sampling was done from 20 chickens in each hall, at the ages of 1-15-30-45 days of breeding and ELISA test was done with BioChek kit. Also, the average weight and food conversion ratio of different groups were measured and compared with each other by weighing weekly.

Results: The mean titers of antibodies on 1, 30, 15 and 45 days after vaccination with AVIVAC-IB V A/91 vaccine were 6960, 2205, 3996 and 4367, respectively, and after vaccination with MSD-4/91 vaccine, they were 7253, 2022, 3716, 4886 respectively. Was. The mean titers in the ELISA test at different ages of the study were in the same and similar titer groups and no difference was observed in their values. Also, the values of titers obtained from vaccination at the age of 30 and 45 days were within the expected range. The results of the ELISA test at the ages of 30 and 45 days had a Vaccination Index (VI) within the specified range of the vaccine and no involvement with the pathogen, clearly in the range of 100-400. Also, the results of weighing and weekly food conversion factor in the two studied groups were similar to each other and had no statistically significant difference.

Conclusion: The results obtained in this study showed that the presentation of the AVIVAC-A/91 infectious bronchitis vaccine in broilers, like the MSD-4/91 vaccine, has the ability to stimulate humoral immunity detectable in the ELISA test against the infectious bronchitis disease within the expected range of vaccination with the live vaccine.

Keywords: Vaccine, Infectious Bronchitis (IB), Broilers, ELISA test, Iran

Comparison of antibody levels of Influenza and Newcastle disease obtained by HI method from broiler, broiler breeder and commercial laying flocks in Iran from 1998 to 2020

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Objectives: HI (Hemagglutination Inhibition) test is widely used in poultry industry to measure antibody levels. Its purpose is to determine flocks challengeor vaccination success rate. Avian Influenza virus and Newcastle disease virus are two common pathogens experimented by this method. We always need to compare the average grade with a baseline to determine the status of the flock. The available studies on this test are scattered and varied, and the void of a study that is comprehensive enough to help us obtain a baseline is strongly felt. In this study, the titer of antibody was evaluated in three kinds of poultryflocks.

materials and methods: Blood or serum samples sent to Pasteur private laboratory from 1998 to 2020, which were from more than 1800 different farms. More than 22000 test results were evaluated in this study. Among the results, the cases that indicated challengeswere excluded, and finally our results reached to a number of 12,990 for Newcastle disease and 8,659 for Influenza. All data were statistically analyzed by Office Excel 365 and SPSS.

Results & Conclusion: The difference between the averages has no significant relationship with the month and season. The average antibody titer has been growing over the years. The difference between the three types of poultryflocks is that in Influenza disease after the third week, the average antibody titer of broiler breeders is always higher than other flocks, and in Newcastle disease, the average antibody titer of broiler breeder flock is higher than other flocks only in the third week. The average ± standard deviation of Newcastle and Influenza titers were estimated to be 6.48±1.42 and 5.92±1.17 and the coefficient of variation was 0.22 and 0.20. The annual increase in the average antibody level of both diseases can be due to increase in vaccination, increase in vaccines quality,improvement of health conditions, and reduction of immune suppressive factors. The higher average of antibody levels in broiler breeder flocks is due to better compliance with health and quarantine conditions.

Keywords: HI Newcastle, HI influenza, Broiler flock, Broiler breeder flock, Commercial laying flock.

The evaluation and importance of Newcastle disease's economic loss in commercial layer poultry

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Objectives: Newcastle disease virus (NDV) causes a highly contagious and devastating disease in poultryand makes up to 100 percent mortality in susceptible populations during devastating outbreaks. Newcastle disease causes heavy economic losses to the global poultry industry by decreasing the growth rate, decrease in egg production,and high morbidity and mortality.The households face substantial economic losses throughout the year due to Newcastle disease. It is ranked 1st among other poultry diseases in village chickens.The economic losses caused by this disease in the poultry industry have given a level of awareness about the importance of Newcastle disease and made it easier to justify the operations against this disease. So, estimating the economic losses caused by Newcastle disease is very important.

Materials & Methods: The data used in this study has been gathered from the last edition of Ministry of Jihad- Agriculture Statistics. The average of the second production cycle in commercial layer poultry is 8 kg per chicken. Also, about 40 percent of chickens would be affected by this disease in the second production cycle. Lastly, the Ministry of Jihad- Agriculture Statistics has announced that the number of commercial layer birds is about 36,434,900. Therefore, theeconomic loss caused by Newcastle diseasecan beestimated based on the following formula:
Economic loss = infected egg laying birds * average production (8kg) * Production reduction percentage (40 percent)

Results & Conclusion: Putting all these together, we can conclude that theminimal damage caused by this disease is about 116,591 Tons. Regarding these statistics, it is clear that Newcastle disease significantly impacts production and causes a lack of eggs. Therefore, we will have to compensate for this reduction by importing eggs from other countries. Hence, a tremendous amount of money will be needed to compensate for the shortage of eggs, which will result ina huge economic loss. At last, these will directly affect the poultry industry and its financial resources, which clarifies the importance of caring for Newcastle disease in poultry flocks to prevent enormous economic losses.

Keywords: Newcastle disease, Economic loss, commercial layer poultry, Iran

The challenge efficacy of commercial entrotropic live Newcastle disease vaccines against genotype VII- virulent virus in chickens

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Objectives: Newcastle disease (ND) is caused by virulent ND viruses (vNDVs), which has the potential to cause significant morbidity and mortality in the poultry industry worldwide.Isolates of NDVs is classified into different genotypes even though they are antigenically belonged to a single serotype. Genotype VII virulent NDVs, as predominant circulating viruses in poultry flocks of Iran. The aim of this study was to investigate the efficiency of3 commercialentrotropiclive vaccines on the protection and shedding rate in SPF chickens, after challenging with the genotype VIIvNDV.

Materials & Methods: Forty one-day-old specific pathogen free (SPF) chickens were randomly allocated in to four experimental groups (n=10 per group) and vaccinated with one of threeentrootropic ND vaccines including E1, E2, E3 or phosphate buffered saline (PBS), as control, at 8 days of age. The chickens were challenged intramuscularly at 20 day of age. Immediately before challenge (28 days of age) and at 7 and 14 post-challenge days,serasamples were collected to measure antibody against NDV using hemagglutination inhibition assay.To evaluate virus shedding, cloacal and oropharyngeal swabs were collected at the 3rd, 5th, 7th and 10th post-challenge days.

Results and conclusion: Results showed thata significant higher antibody titers and protection level in vaccinated groups compared to the control group.On the 7th day after the challenge, the antibody level was significant higher in E2, than compared to other groups ($P<0.05$). On the 14th day after the challenge (42 days old),the average antibody titer in E1 and E3 groups had a significant difference compared to 28 and 35 days old.All groups had the ability to reduce shading to different degrees, among which, E2 group was able to completely prevent shading.As a result, it can be acknowledged that the commercial entrotropic ND vaccines have the ability to control outbreaks caused by virulent genotype VII NDVs.

Keywords: Newcastle disease, Genotype VII, Shedding, Heterologous commercial vaccine

The challenge efficacy of commercial pneumotropic live Newcastle disease vaccines against genotype VII-virulent virus in chickens

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Objectives: Isolates of Newcastle diseasevirus (NDV) is classified into different genotypes even though they are antigenically belonged to a single serotype. Genotype VII virulent NDVs, as predominant circulating viruses in poultry flocks, are associated with high chickenmortality and economical losses in poultry sector. This study aimed to evaluateefficacy three commercial live genotype II- based Newcastle disease (ND) vaccine on mortality and viral shedding in SPF chickens challenged by genotype VII virulent NDV (vNDV).

Materials & Methods: Forty one-day-old specific pathogen free (SPF) chickens were randomly allocated in to four experimental groups (n=10 per group) and vaccinated with one of threepneumotropic ND vaccines including P1, P2, P3 or phosphate buffered saline (PBS), as control, at 8 days of age. The chickens were challenged intramuscularly at 20 day of age. Immediately before challenge (28 days of age) and at 7 and 14 post-challenge days,serasamples were collected to measure antibody against NDV using hemagglutination inhibition assay.To evaluate virus shedding, cloacal and oropharyngeal swabs were collected at the 3rd, 5th, 7th and 10th post-challenge days.

Results & Conclusion: Results showed thata significant higher antibody titers and protection level in vaccinated groups compared to the control group ($P<0.05$). Although the all of the administrated vaccines had no significant difference in antibody titers before challenge, the vaccines in P2 and P3 groups ($P>0.05$) were associated withhigher protection compared to P1. All the three heterologous vaccines had high ability to prevent shedding of virulent genotype VII NDV at post-challengedays. In conclusion, the administrated heterologous vaccines may help to control outbreaks caused by virulent genotype VII NDV.

Keywords: Newcastle disease virus, Genotype VII, Shedding, Heterologous vaccine

Vitamin E can down—regulated some of apoptotic genes involving in pulmonary hypertensive broiler chicken

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Abstract: This study was aimed to investigate the efficacy of vitamin E in the reducing of mRNA levels of caspases 1,2 and 3 involving in apoptosis pathway. Ninety fast-growing chickens (*Ross 308*) of 1 day old were randomly assigned to three equal groups including sham (basal diet), control (basal diet+1.5mg/kg of T3) and treatment (basal diet+400mg/kg of vitamin E+1.5 mg/kg of T3) groups each of 30 chickens per pen with 3 replicate pens per each group (n=10). To induce ascites 1.5mg/kg of T3 was added to basal diet from day7 of age to the end of experiment. At days 21 and 49 post-reared, 15 chicks from each group were randomly selected, scarified and RV/TV ratio as well as the expression level of caspases1,2,and 3 genes were constitutively expressed in the lung and right ventricle of any three groups of broiler chickens and compared. Vitamin E reduced the relative expression of caspase1,2, and 3 in the lung and heart tissues of broiler chickens with ascites as well as RV/TV ratio at days 21 and 49 of age.The deceased mRNA levels of all three caspases in the hearts and lungs of broilers with acites that received Vitamin E may be evidence of down-regulation of apoptosis pathway result from antioxidant activity or neutralizing of ROS which is involved in the pathophysiology of broiler chickens with ascites. Our data also showed that unlike caspase 3, the caspases 1 and 2 are up-regulated in right ventricle prior to lung tissues in the broiler with PHS.

Keywords: Antioxidant,Apoptosis, Caspases,Pulmonary Hypertension Syndrome

Garlic powder supplementary diet prevented Pulmonary Hypertension Syndrome by reducing apoptosis in broiler chickens

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Pulmonary hypertension syndrome (PHS) is a metabolic disorder with cardiopulmonary symptoms. Also garlic powder (GP) is a food item using for treatment of many diseases such as heart and lung diseases. Here, we investigated the effect of garlic powder supplementary diet on the apoptosis and right ventricle hypertrophy of PHS in broiler chickens.Broiler chickens were randomly divided into 3 groups (sham, PHS, and PHS+GS). The PHS was induced by 3,5,3´-L-triiodothyronine in broiler chickens, and GP was added to the ration after week 1 of rearing (PHS+GP). Then, lung and ventricle tissues were collected at day 21 and 49. PHS was calculated at 21 and 49 days based on the RV/TV ratio index. Gene expression of caspase1 and 2 were evaluated by semi quantitative RT-PCR in the lungs and right heart ventricles. The results showed that right ventricular hypertrophy increased at day 49 in the PHS group compared to sham, while garlic consumption decreased this ratio to the control level. Also, the expression of caspase1 and 2 in the lungs elevated at day 49 and GP diet prevented this increase. Moreover, in the right ventricle tissue PHS affected caspase1 on day 21 and 49, although the expression of caspase2 significantly increased just at day 49 in PHS group.This elevation was defeated in both time by garlic consumption.Therefore, it can be conclude that consuming garlic as a dietary supplement could prevent PHS by influencing apoptosis in the lung and heart of broilers.

Keywords:Pulmonary hypertension syndrome; broiler;Ross 308; caspase; Garlic powder

Comparison effect of lasalocid, diclazuril, probiotic and synbiotic on histomorphological changes of small intestine induced by *E. tenella*

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This study was aimed to investigate the comparison of effect of anticoccidal drugs including lasalocid and diclazuril with probiotic and symbiotic on growth performance and intestinal morphology in broiler chicken.One hundred eighty chickens (*Ross 308*, 1 day old) were randomly divided into 6 equal groups (n=30) including the negative control (received basal diet), the positive control (received basal diet+oral inoculation of 3×10^4sporulated oocytesof *E. tenella*, and four treatment groups. All four treatment groups were fed basal diet+oral inoculation 3×10^4sporulated oocytes *of E. tenella* from 14 day of age to end of study. The treatment groups received one of following protocols: 500g/1000 kg of diet/daily lasalocid, 1kg/1000 kg of diet/daily symbiotic, 1kg/1000 kg of diet/dailydiclazuril, and 1kg/1000 kg of diet/daily *SafMannan* probiotics. At days of 28 and 49 of age, 9 chickens were blindly chosen from each group were scarified by decapitation and their various segments of small intestine including ileum, jejunum, and duodenum were evaluated histomorphologically. We have found that the economic losses resulted from coccidalinfection in the poultry industry is caused by the decreased performance of broiler chicken induced by morphological changes in the any three segments of small intestine including duodenum, jejunum, and ileum, specially jejunum. The morphological changes in the jejunum and ileum are started sooner/severe and later/mild than those other segments, respectively. The anticoccidal drugs, symbiotic and probiotic can prevent partially morphological changes in any three segments of small intestine in broiler chicken with coccidiosis. Since, the jejunum morphological changes are started sooner than other parts and surface area of jejunal villi is important for nutrition absorbance as well as growth performance lasolacid was better than others treatment in this regard. Further researches are needed to evaluate the effect of combination treatments.

Key words: coccidiosis, small intestine morphology, probiotic, symbiotic, anticoccidial drugs

The effect of vitamin C on the reduction of caspase(2) gene expression in broilers with pulmonary hypertension syndrome

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Ascites syndrome is one of the most common metabolic complications in poultry. Pulmonary hypertension syndrome with high pulmonary arterial pressure, right ventricular hypertrophy and dilation is a problem of broilers. On the other hand it is proved that apoptosis in heart failure and pulmonary hypertension increases. In this study, the effect of vitamin C on apoptosis by measuring the expression of caspase (2) in the heart and lungs of broilers with pulmonary hypertension syndrome was evaluated. T3 as a thyroid hormone was added to the ration after week 1 of rearing. Pulmonary hypertension was induced at 49 days based on RV/TV ratio index. After PCR for caspase2 and b-actin (Housekeeping) genes the density of each band were measured and were recorded as the ratio caspase2/ β-actin and this ratio were compared at different ages in witness groups (the right ventricle and lung). The amount of mRNA of the gene caspase 2 at 21 and 49 days showed a significant reduction ($p<0.05$) in the treatment group. this significant difference represents the reduction of apoptosis in the group who by receiving the hormone T3 were infected to pulmonary hypertension, and yet have been treated with vitamin C. Also, according to the results, the RV/ TV ratio improved in the treatment group.

Keywords:pulmonary hypertension syndrome, apoptosis, caspase 2, vitamin C

The effect of vitamin E on morphological changes of intestinal villi in broilers with coccidiosis

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Avian coccidiosis is one the most common parasitic diseases in poultry with great economic significance. This parasite lives in the cells lining the wall of the Lieberkuhn glands in the small intestine. The aim of this study was to investigate the protective effect of vitamin E on the morphology of duodenum, jejunum and ileum villi in the small intestine of broilers with coccidiosis. So, 90 one-day-old broiler chickens were purchased and divided into 3 groups (30 pieces in three replicates): Healthy group: Receiving a basic diet throughout the experimental period, Patient control group: Receiving basal diet+0.25 ml of suspension containing 30,000 *Eimeria tenella* oocytes since fourteen days old (oral inoculation). Treatment group: Receiving a basal diet+0.25 ml of suspension containing 30,000 *Eimeria tenella* oocytes from fourteen days old (oral inoculation)+vitamin E at dose of 400 IU in the diet from the beginning of the period. On days 28 and 49, each group (3 chicks from each replicate) was randomly selected, weighted, killed by cervical method and the length of different parts of the small intestine (ileum, jejunum and ileum) were measured. The results showed that vitamin E significantly increased the height, width and area of the duodenum, jejunum and ileum villi as well as the depth of Lieberkohen glands compared to the patient control group in days of 28 and 49. So, vitamin E can affect the morphology of small intestinal villi and improved the size of intestinal villi in broiler chickens with coccidiosis and protect intestinal epithelial cells.

Keywords:Vitamin E, Coccidiosis, Small intestine, villi Morphology