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Designing of optimum selection index for Afshari sheep breeding under rural production system

Mokhtar Ali Abbasi and Sima Savar Sofla *

1. Associated Professor and Assistant Professor, Department of Animal Breeding and Genetic, Animal Science Research Institute, Karaj, Iran

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Abstract

This study was evaluated some strategies and determined the suitable selection index for Afshari sheep using simulated data. The relative importance of traits was determined based on the estimated economic values and consequently, the most benefit traits were applied to selection indexes construction. The interest indexes were different combination of traits including ewe body weight (EBW), annual wools weight (AWW) and total weaning weight for each exposed ewe (TWWEE). The index 1 was included all three mentioned traits. The indexes two, three and four were included (AWW, TWWEE), (EBW, TWWEE) and (TWWEE), respectively. The results indicated that the aggregate genotype, selection index and economic progress increased by increasing in the population size and decreasing in ram ratio, but made reduction in inbreeding average, in all indexes. In more cases, the aggregate genotype decreased by removing a trait in the index. The comparisons among indexes indicated that the most suitable selection index for this breed is index 1 which included EBW, AWW and TWWEE. This index had a maximum selection index average, aggregate genotype and economic progress.

Keywords: aggregate genotype, computer simulation, genetic progress, inbreeding, selection criterion.

Email: pmaz_abbasi@yahoo.com

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Structural analysis of the TLR4 gene in Iranian commercial Arian line and west Azerbaijan native chicks

Sana Farhadi, Ali Akbar Masoudi and Rasoul Vaez Torshizi*

Former M.Sc. Student, Assistant Professor and Associate Professor, Department of Animal Science, Faculty of Agriculture, Tarbiat Modares University, Tehran, Iran

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Abstract

The TLR4 gene structure as the main receptor for lipopolysaccharide recognition of Gram-negative bacteria was investigated in two strains of Iranian commercial Arian line and west Azerbaijan native chicks and its expression was studied in some major organs. Blood samples of the 120 birds were taken and total DNAs extracted. Then, the target gene was sequenced using four pairs of primers on four samples of each strain. The effects of amino acid changes on protein function were assessed by PANTHER software. To investigate the gene expression, total RNAs were extracted from liver, spleen, and lung tissues after slaughter of the birds. Gene expression was assessed by semi-quantitative RT-PCR. The amplified RNAs from tissues of liver, spleen and lungs. Then electrophoresis images were processed with the Image software and quantitative data analyzed by MINITAB. The results showed three new single polymorphisms (T1147C, C2246A and A1832G) in the sequence of TLR4 gene in the studied populations. The effects of variations on TLR4 protein structure indicated a deleterious effect of mutations on protein structure. The TLR4 gene expression in case of native and commercial strains did not show significant differences. Due to importance of the TLR4 in innate immunity and identification of some novel mutations affecting on protein structure, this gene could be a valuable candidate related to genetic resistance in poultry.

Keywords: chicken, gene expression, protein structure, SNP, TLR4.

Email: masoudia@modares.ac.ir

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Effect of physiological stress and dietary chromium nanoparticles supplementation on performance and meat quality traits of Japanese quail

*Atefeh Berenjian, Seyed Davood Sharifi *, Abdollah Mohammadi Sangcheshmeh and Shokoofeh Ghazanfari*

Graduated M.Sc., Associate Professor and Assistant Professors, Department of Animal and Poultry Science, College of Abouraihan, University of Tehran, Pakdasht, Iran

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Abstract

Effects of chromium nano particles (NanoCr) on performance and meat quality of Japanese quail under physiological stress was determined by using 360 birds in a completely randomized design with six treatments, four replicates and 15 birds per each, during 17- 35 d of age. The tratments were negative control (non-stressed), and five groups under physiological stress which fed on diets supplemented with different levels of NanoCr (0, 200, 400, 800 and 1200 $\mu g kg^{-1}$). Dexamethasone (0.6 $mg kg^{-1}$ BW) was added to diet for induction of physiological stress. Physiological stress reduced feed intake and growth, whereas increased feed conversion ratio (FCR) and thigh and breast muscles malondialdehyde (MDA) concentration ($P<0.05$). Stressed birds were fed on diets containing increased levels of NanoCr linearly improved weight gain ($P< 0.02$), and decreaced FCR ($P< 0.05$), MDA levels in breast ($P< 0.04$), and thigh muscles ($P< 0.006$). The results showed that supplementation of diet with NanoCr can alleviate the negative effects of physiological stress on performance and meat quality of quails.

Keywords: chromium nanoparticles, Japanese quail, malondialdehyde, meat quality**,** physiological stress.

Email: sdsharifi@ut.ac.ir

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Effects of different levels of soybean lecithin on performance and blood lipids of broiler chicks

*Hanieh Sadat Banikamal, Mahdi Zhandi *, Malak Shakeri and Hossein Moravej*

Former Master Students, Assistant and Associated Professors, Department of Animal Science, Faculty of Science and Agricultural Engineering, College of Agriculture and Natural Resources, University of Tehran, Karaj, Iran

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Abstract

This study was conducted to investigate the effects of different levels of soybean lecithin on performance and blood lipids of broiler chicks. A total of 180 one day old Ross 308 broiler chicks were used in a completely randomized design with nine treatments (diets with 0, 0.2, 0.4, 0.6, 0.8, 1, 1.2, 1.4 and 1.6 percent of soybean lecithin) and four replicates for 47 days-rearing period. In order to evaluate the biochemical factors of blood including cholesterol, triglyceride, high density lipoprotein and low density lipoprotein, blood sampling from chickens were taken in day 41. The traits of weight gain, feed intake and feed conversion ratio were evaluated at the end of each period. The results showed that different levels of soybean lecithin had no significant effect on weight gain, feed intake and feed conversion ratio traits during each period. Increasing in the level of lecithin, decreased the concentration of cholesterol, triglyceride and low density lipoprotein and increased the high density lipoprotein concentration in blood plasma ($P<0.05$). In conclusion, dietary inclusion lecithin up to 1.6 percent, have no any effect on broiler performance, but could reduce cholesterol, triglyceride, and low density lipoprotein and increase high density lipoprotein in blood's plasma.

Keywords: blood lipoprotein, cholesterol, feed conversion ratio, phosphatidylcholine, triglycerides.

Email: mzhandi@ut.ac.ir

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In vitro binding capacity of organic and inorganic sources for minerals

Ali Ghodrat[1], Akbar Yaghobfar[2], Yahya Ebrahimnezhad[1], Habib Aghdam Shahryar[1] and Abolfazl Ghorbani[1]*

1. Ph.D. Candidate, Associate Professor and Assistant Professors, Department of Animal Science, Shabestar Branch, Islamic Azad University, Shabestar, Iran
2. Professor, Department of Animal and Poultry Nutrition, Animal Science Research Institute, Karaj, Iran

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Abstract

This study was carried out to determination of *in vitro* binding capacity of organic (wheat and barley) and inorganic (perlite) sources for Mn, Zn, Cu, and Fe. For this reason wheat and barley were analyzed chemically for moisture, protein, ash, and ether extract, total carbohydrate, NDF, ADF, ADL, crude fiber, viscosity, cellulose, and total dietary fiber. The *in vitro* mineral binding capacity of wheat, barley, and perlite to Mn, Zn, Fe, and Cu under sequential simulated physiological conditions of the stomach, small intestine, and colon was investigated and compared. Acid washing was efficient in removing most endogenous minerals from samples with the exception of Fe. Barley showed the highest mineral binding capacity for Mn (5.16 percent), Zn (11.07 percent), and Cu (44.48 percent) in small intestine. Perlite had lower mineral binding capacity (Mn (0.76 percent), Zn (1.74 percent) and Cu (1.41 percent) than wheat and barley. Organic sources had an affinity for Fe > Cu > Zn > Mn. Dietary Fiber had a negative impact on mineral bioavailability.

Keywords: barley, dietary fiber, mineral binding, perlite, wheat.

Email: yaghobfar@yahoo.com

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Determination of the share of cost-effective price per kilogram of broilers by using a multi-criteria decision analysis in Tehran province

Sayed Abdoullah Hosseini[1] Morteza Kouchakzade Malari[2] and Hamid Reza Sydabadi[1]*

1. Assistant Professor and Research Worker, Department of Nutrition, Animal Science Research Institute, Karaj, Iran
2. M.Sc. Student, Department of Animal Science, Faculty of Agriculture, Azad university of Varamin, Varamin, Iran

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Abstract

This study was conducted to evaluate the share of cost factors affecting on final cost of broiler live weight per kilogram in Tehran province. Data were collected through questionnaires. Farms were divided to three cost ranges: less than 35,000, between 35,000 to 40,000, and over 40000 Rails based on production cost per kg of live weight. In this study, water and additives, staff, vaccines, transportation, laboratory, chicks, feed, insurance, letter, personal cost and fuel were investigated. Share of cost-effective price per kilogram of broilers by using a multi-criteria decision analysis were determined. Performance parameters, including body weight and feed conversion ratio were not different among three groups ($P>0.05$). Water and additives, staff, vaccines and fuel were the factors that influenced the difference among the three groups, so they made a significant difference in final live weight cost. Insurance and feed had the lowest effects on final price. The group with over 40000 Rails cost for kg of live weight production had less productivity of cost factors. In conclusion, in order to reduce production costs in poultry farms should consider the entire costs factor. For example, the food and insurance costs are the highest and lowest total cost of production that had a minor role in the creation of a difference between different groups of broiler cost in this study.

Keywords: broilers, cost of live weight chicken, multi-criteria decision analysis, share of cost factors.

Email: hosseini1355@gmail.com

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Effects of ensiling on nutrient value and some physical and chemical parameters in pistachio by-products

Pirouz Shakeri[1], Morteza Rezaie[2] and Seyed Ahmad Mirhadi[2]*

1. Assistant Professor, Department of Animal Science, Kerman Agricultural and Natural Resources Research Center, Kerman, Iran
2. Assistant Professor, Department of Animal Nutrition, Iran Research Institute of Animal Science, Karaj, Iran

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Abstract

The present study was conducted to investigate the effects of ensiling pistachio by-product (PBP) on nutrient value, some physical and chemical parameters. Fresh PBP was ensiled into a trench silo for three months and simultaneously amount of PBP was dried in front of the sun. Chemical composition, buffering capacity, water holding capacity, protein fractionation according to cornell net carbohydrate and protein system (CNCPS), concentration of aflatoxin poison and ruminal and post ruminal degradability was measured for both products. The result showed that pH reduced from 4.73 to 4.12 after ensiling. The ensiled PBP had low aNDFom and water soluble carbohydrates and high phenolic compounds content compared to the sun dried PBP ($P<0.05$). There was no difference in buffering capacity, water holding capacity, non- protein nitrogen, concentration of aflatoxin and degradability in total gastrointestinal tract between sun-dried and ensiled PBP. Aflatoxin concentration for both PBP was in the permitable range of using in animal nutrition. It was concluded that PBP had a good potential for ensiling and that process of ensiling had no detrimental effect on nutritive value of PBP and furthermore ensiled PBP had a desirable aerobic stability.

Keywords: aerobic stability, aflatoxin, buffering capacity, nutritive value, pistachio by-product, water holding capacity.

Email: Pirouz_shakeri@yahoo.co.uk

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Effects on production performance and fatty acids composition of longissimus muscle of feeding dried de-oiled *Satureja khuzistanica* in Farahani finishing lambs

Hossein Karimi, Arash Azarfar*, Heshmatollah Khosravinia and Ali Kiani

M.Sc. Student, Associate Professors and Assistant Professor, Department of Animal Science, Faculty of Agriculture, Lorestan University, Khorrambad, Iran

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Abstract

Our objective was to examine the effect of inclusion of dried de-oiled savory (*Satureja khuzistanica*; DDS) on production performance and fatty acids composition of longissimus muscle (LM) of finishing lambs. 30 Farhani lambs with average body weight of 33.6±1.4 kg were used. The lambs were randomly divided into five groups and individually fed with the experimental diets. In the experimental diets, alfalfa was replaced by dried de-oiled savory at the levels of zero (control diet), 25, 50, 75 and 100 percent. The lambs were fed whit finishing diets for 60 days following a 15-day adaptation period. During the finishing periods the lambs were weighed individually every 15 days and average daily gain, average feed consumption and feed conversion ratio were calculated. At the end of experiment, the lambs were slaughtered. Samples of LM along with subcutaneous fat were taken from the region of 12th and 13th ribs post-mortem and their fatty acids profile were determined by gas chromatography. The results of current study showed that the experimental diets had no effect on production parameters of lambs assessed. Saturated fatty acids content of LM was higher in the lambs fed with diets in which alfalfa was replaced by DDS at the level of 25 percent than those fed with diets in which alfalfa fully replaced by DDS ($P<0.05$). The lambs fed on diets in which alfalfa was replaced by DDS at the levels higher than 25 percent had numerically higher saturated fatty acids in their LM compared to control diet-fed lambs. The results showed that dietary inclusion of DDS at the level of 75 percent instead of alfalfa numerically increased poly-unsaturated fatty acids content of LM. Dietary replacement of alfalfa with DDS at the levels of 25 to 75 percent numerically lowered the proportion of omega-6 to omega-3 fatty acids of LM compared to the control diet. Results showed that Alfalfa can be replaced by dried de-oiled savory in finishing lambs diets and improve meat quality by reducing sits saturated fatty acids content.

Keywords: alfalfa, bio-hydrogenation, fatty acids, finishing lambs, *Satureja khuzistanica.*

Email: azarfar.a@lu.ac.ir

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Ruminal disappearance of protein and amino acids of untreated and treated canola meal with gamma ray and electron beam

Farzad Ghanbari[1], Taghi Ghoorchi[2], Parvin Shawrang[3], Hormoz Mansouri[4], Nour Mohammad Torbatinejad[2]*

1. Assistant Professor, Department of Animal Science, Faculty of Agriculture and Natural Resources, Gonbad Kavous University, Iran
2. Professor, Department of Animal and Poultry Nutrition, Faculty of Animal Science, Gorgan University of Agricultural Sciences and Natural Resources, Iran
3. Assistant Professor, Nuclear Agriculture Research School, Nuclear Science and Technology Research Institute, Karaj, Iran
4. Assistant Professor, Department of Nutrition and Phisiology of Animal and Poultry, Animal Science Research Institute, Karaj, Iran

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Abstract

This study was conducted to investigate the effects of doses of 25, 50 and 75 kGy of gamma ray (GR) and electron beam (EB) ionizing radiations on ruminal disappearance of amino acids (AAs) and protein subunits of canola meal (CM). The nylon bag technique was used for degradability trial. Three ruminally fistulated Taleshi bulls were used for this aim. The disappearance trends of protein subunits for protein meal samples were determined using sodium dodecyl sulfate-polyacrylamide gel electrophoresis (SDS-PAGE). Irradiation decreased ruminal degradability of AAs ($P<0.05$). In this case, except for serine, tyrosine and glutamate, the effect of GR in reducing AAs degradability was more than the EB. Electrophoresis analysis identified the presence of cruciferin with four subunits in CM. In unirradiated CM, all four protein subunits of cruciferin were degraded after 8 h of rumen incubation. Doses of 25, 50 and 75 kGy of EB and GR preserved the protein subunits of cruciferin up to 16, 24 and 48 h, respectively. It can be concluded that processing with ionizing radiation of EB and GR decreases ruminal degradation of CM protein subunits of cruciferin and AAs. The effect of GR in reducing ruminal degradation of CM proteins is more than EB.

Keywords: canola meal, cruciferin, degradability, electrophoresis, ionizing radiations.

Email: farzadghanbari@yahoo.com

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The effect of melatonin and bromocryptine administration on body weight and shedding fibre of Raeini goats

Ardeshir Mohit[1], Mahnaz Salehi[2], and Zeynab Khob Bakhat[1]*

1. Assistant Professor and Ph.D. Candidate, Department of Animal Science, Faculty of Agricultural, Guilan University, Rasht, Iran
2. Instructor, Department of Animal Product, Animal Science Research Institute, Karaj, Alborz, Iran

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Abstract

The effect of melatonin and bromocryptine on body weight, fibre shedding and cashmere traits was investigated by using 24 Raeini female goats (2-3 years old) in four experimental groups: control (C); melatonin (MI) implant (18 mg at first and repeated after 40 days), bromocryptine (B) injection, (0.5 mg/kg BW per three days) melatonin and bromocryptine implant and injection (MIB). All goats were maintained under natural photoperiodic conditioned of short day photoperiod (8 h light and 18 h dark), for two months. Fibre was harvested by using wooden combs and each goat was combed four times at two week intervals, from 23th February to 8th March. Combed fibers were 23.3, 15.7, 17.0 and 21.3 percent for MI, B and MIB treated and C groups. Cashmere fiber diameter (CFD) for MI group (21.4 *um*) was higher than the other C, B and MIB groups 20.2, 19.9 and 19.8 *um* ($P<0.01$). The CV of CFD was significant and higher in C group compared with the other groups ($P<0.05$). These results suggest that melatonin and bromocryptine improve uniformity of cashmere diameter in Raeini female goats.

Keywords: cashmere percent, combed fiber, CV of diameter, diameter, length.

Email: msalehi572000@yahoo.com

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FABP4 gene polymorphism in Sistani and Dashtiari cattle and its association with growth traits in Sistani cattle

Samane Abuli, Gholam Reza Dashab*, Mohammad Rokouei, Mehdi Vafaei Valeh

M.Sc. and Assistant Professors, Department of Animal Science, Faculty of Agriculture, University of Zabol, Iran

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Abstract

The polymorphism in exon three of *FABP4* gene and its association with growth traits of 45 Sistani (n=30) and Dashtiari (n=15) cattle were investigated. DNA extraction from the whole blood was performed and its quality was determined by electrophoresis of one percent agarose gel. Animal genotypes were determined based on polymerase chain reaction (PCR) products and their band size electrophoresed on agarose 2.8 percent resulted from enzyme digestion by *NlaIII*. The pattern of bands showed three genotypes including AA, AB and BB in two Sistani and Dashtiari breeds with frequency of 67, 30 and three percent and 73, 27 and zero percent, respectively. The frequency of A and B alleles in exon three of *FABP4* in Sistani and Dashtiari breeds were 82 and 18 percent and 86.5 and 13.5 percent, respectively. Heterozygosity indices including Shannon index (I), Nei's index, observed and expected heterozygosity in Sistani and Dashtiari population were 48, 30, 30 and 30 percent and 39, 11, 27 and 24 percent, respectively. The association between genotypes and growth-related traits were significant for body weights in six, nine and 12 months of age. Therefore, this locus can be considered as a candidate gene in breeding programs for describing the variation of growth traits after weaning age in calves.

Keywords: *FABP4* gene, heterozygosity, native breeds, polymorphism information content, Sistani breed.

Email: dashab@uoz.ac.ir

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Effects of feeding frequency and adding plant oil to diet on performance and feeding behavior of lactating Holstein dairy cows

Kamran Akbari Pabandi and Hamid Reza Mirzaei Alamouti*

Former M.Sc. Student and Assistant Professor, Department of Animal Sciences, Faculty of Agriculture, University of Zanjan, Iran

Received: 24 November 2014 **Accepted: 23 February 2015**

Abstract

This experiment was conducted to investigate the effect of feeding frequency and oil supplementation to the diet on performance and feeding behavior of lactating dairy cows. Twenty four lactating Holstein cows, 12 primiparous, (BW= 626±58 Kg and DIM= 195±44 day) and 12 multiparous, (BW= 617±25 Kg and DIM= 207±39 day) were randomly assigned to four diets contained 2.5 percent supplemental oil or no oil and feeding frequency of 3 or 1 time per day in a randomized complete block design with a 2×2 factorial arrangement. Frequency of feed delivery and oil supplementation had no effect on dry matter intake. Oil supplementation reduced slug feeding especially with feeding once per day ($P<0.05$). Feeding frequency and oil supplementation interaction tended to significant for milk yield ($P= 0.09$), as there was a numerical increase in milk yield in oil 3 time feeding with oil diet. The cows fed oil diet in 3 time feed delivery had lower milk protein ($P<0.05$), but milk fat increased with 1 time feeding and oil supplementation ($P<0.05$). The results showed that oil supplementation to mid lactating cows diet can decreased compromised effects of decreasing feeding frequency.

Keywords: chewing behavior, feeding frequency, Holstein cow, milk yield and composition, supplemental oil.

Email: k.akbari2@yahoo.com

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Effect of Protexin probiotics supplementation to aflatoxin contaminated diet on performance of Japanese quail

Majid Aftabi[1], Farzad Bagherzadeh Kasmani[1], Ghasem Jalilvan[1], Mehran Mehri[1] and Mohammad Amir Karimi Torshizi[2]*

1. M.Sc. Student and Assistant Professors, Department of Animal Science, Faculty of Agriculture, University of Zabol, Iran
2. Assistant Professor, Department of Poultry Science, Faculty of Agriculture, Tarbiat Modares University, Iran

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Abstract

Effect of Protexin to diminish negative consequences of feeding aflatoxin B_1 (AFB_1) contaminated diet on performance, immune response, meat quality and ileal microbial flora were examined using 320 seven-day-old Japanese quails fed four treatments [control diet (without additives), diet containing 2.5 mg AFB_1/kg, diet containing 150 mg Protexin/kg, diet containing 2.5 mg AFB_1/kg+150 mg Protexin/kg] with four replicates and 20 birds each in a completely randomized design. Feed intake of birds fed probiotic diet was higher than those birds in control group ($P<0.05$). Weight gain in birds fed aflatoxin contaminated diet was lower than birds in other treatments ($P<0.05$). Humoral immunity response in quails related to aflatoxin and probiotic groups was lower and higher than control group, respectively ($P<0.05$). Skin thickness increase after 48h challenging with dinitrochlorobenzene (DNCB) in birds fed aflatoxin contaminated diet was lower than the other groups ($P<0.05$). Concentration of malondialdehyde (after freezing meat for 30 days) in the meat of aflatoxin fed birds was higher than the other birds ($P<0.05$). Population of *E. coli* and lactic acid bacteria in birds fed protexin or aflatoxin+protexin was lower and higher than the two other groups, respectively ($P<0.05$). Based on the result of this research, dietary inclusion of protexin probiotics into aflatoxin contaminated diet could improve immunity response and intestinal microbial population in Japanese quails.

Keywords: aflatoxicosis, immunity, Japanese quail, malondialdehyde, probiotics.

Email: fbkasmani@uoz.ac.ir

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Effect of levels of zinc on footpad lesions and some reproductive and blood parameters of broiler breeders

Morteza Nadali, Somayyeh Salari, Mohammad Boujarpour, Saleh Tabatabaei Vakili and Mohsen Sari*

MSc. and Assistant Professors, Department of Animal Science, College of Animal Science and Food Technology, Ramin Agriculture and Natural Resources University of Khouzestan, Ahwaz, Mollasani, Iran

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Abstract

Effect of levels of zinc supplementation on footpad lesions, reproductive and blood parameters of broiler breeders with 300 hens and 40 roosters of Ross 308 strain with four treatments, five replicates and 15 hens and two roosters in each for 12 weeks was evaluated in a completely randomized design. Dietary treatments were 80, 110, 140 and 170 mg zinc/kg diet. Increasing supplemental zinc level especial 170 mg/kg diet increased hatchability ($P<0.05$). Levels of 140 and 170 mg zinc/kg diet significantly improved footpad lesions ($P<0.05$). In the first phase of incubation, the lowest rate of mortality observed in 140mg zinc/kg diet ($P<0.05$). Also, number of large and small size follicles of broiler breeders increased at 170 mg zinc/kg diet ($P<0.05$). Blood parameters did not affect significantly. The results of this experiment showed that supplementation of broiler breeders diet with zinc at 140 and 170 mg/kg diet could improve hatchability and had desirable effect on footpad health.

Keywords: broiler breeder, embryo mortality, follicle, hatchability, lipid parameters.

Email: somayehsallary@yahoo.com

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Effects of *R. coriaria* L. and *P. farcta* extracts as compared to oxytetracycline on broiler performance, serum biochemistry, and immune response

Hassan Shirzadi[1], Farid Shariatmadari[1], Mohammad Amir Karimi-Torshizi[1], Shaban Rahimi[1] and Ali Akbar Masoudi[2]*

1. Ph.D. Candidate, Professor, Assistant Professor and Professor, Department of Poultry Science, Faculty of Agriculture, Tarbiat Modares University, Iran
2. Assistant Professor, Department of Animal Science; Faculty of Agriculture, Tarbiat Modares University, Iran

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Abstract

A study was carried out to evaluate the effects of *R. coriaria* L. and *P. farcta* extracts as alternatives to antibiotic growth promoters in broilers diet. A total of 300 one-day-old male Ross 308 chicks were randomly allocated to four dietary treatments (five pen replicates, 15 birds per pen) for the 0- to 28-d period, and all data were analyzed in a randomized complete design. Dietary treatments included a basal diet (as control diet, without additive) and three similar diets that were supplemented with 200 mg/kg *R. coriaria* L. extract, *P. farcta* extract, and oxytetracycline 20 percent, respectively. The results showed that average daily gain was significantly increased ($P<0.05$) by supplementing diets with all feed additives in 7-14 d period and entire (0-28 d). Broilers fed the diets supplemented with each of extracts had a low serum cholesterol levels as compared to control diet ($P<0.05$). Moreover, the antibody titer against Newcastle disease virus was significantly increased by supplemented diets ($P<0.05$). However, adding feed additive to diets had no significant effect on antibody titer against SRBC, skin thickness due to DNCB challenge and toe-web thickness in response to injection of phytohemagglutinin-P. In addition, supplementing diet with *P. farcta* caused to a significant increase in relative bursa of fabricius weight in contrast with control diet. Based on current results, it can be concluded that *R. coriaria* and *P. farcta* extracts can be used as alternatives to oxytetracycline as a growth promoter in broilers diet.

Keywords: antibiotic, broiler chicken, immune system, *P. farcta* root extract, *R. coriaria* fruit extract.

Email: shariatf@modares.ac.ir