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Whole-genome scan of eight Iranian native cattle breeds to detect selection signatures

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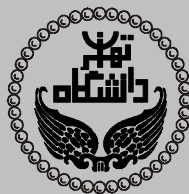
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Abstract

This study aimed to identify genes that show signatures of selection for mutations in Iranian native cattle breeds. The data consisted of genotypes for ~777962 SNP markers of 90 animals from eight Iranian native cattle breeds distributing over the country. Therefore, the aim was to identifying divergently selected regions of the genome. Study of population differentiation across the genome using Weir and Cockerham's F_{ST} test revealed some regions showing evidence of selection. Across the 30 bovine chromosomes (BTA), seven putative selection signatures were detected. These regions were located on chromosomes 1, 2, 7, 8, 12, 13 and X. Finally, study of the reported QTL regions in the orthologous areas of the cattle genome showed that the genomic regions identified in this study overlapped with the reported QTL representing economically important traits such as milk yield, cold tolerance and reproductive traits. Result of this research provided important information on existence of genetic diversity and selection signatures in Iranian native cattle.

Keywords: Fixation index, Genomic scan, Iranian native cattle, Population differentiation, Selective sweeps.



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Economic Evaluation of laying hen breeding in Tehran province

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Abstract

This study carried out for economic investigation on laying hen farms in Tehran province. The data was collected through completion of questionnaire by direct interview from 41 layer farms, which were selected by stratified random sampling method in 2013. Among all types of production functions, the Cobb-Douglas production function was selected and its coefficients was estimated and average product, marginal product and the ratio of value of marginal product to input prices and inputs' production elasticity was estimated. The results showed that more than 87 percent of cost of egg production belongs to the feed and pullet costs. The production elasticity of all studied inputs including feed intake, pullet and labor were positive and less than one, which shows that the producers were utilized these inputs economically. The average production of feed and pullet inputs was 0.49 and 18.5, respectively and on this basis, on an average, 0.49 kilograms eggs were produced for one kilogram of feed and 18.5 kilograms of eggs for one pullet in studied laying hen farms. According to the results, feed intake and pullet were most important effective factors on egg production in Tehran province. Meanwhile, considering the price of purchased inputs and sold egg, producers utilize these inputs economically and efficiently based on the ratio of value of marginal product to input price index.

Keywords: Cobb-Douglas, Elasticity of production, Input, Production cost, Production function.



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Effect of amount alfalfa hay and replacing corn grain by other grains in starter on performance of pre and post-weaning Holstein calves- A meta-analysis

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Abstract

This study was carried out to assess the effects of alfalfa hay level and replacing corn grain by other grains in starter on daily feed intake, average daily gain (ADG) and feed efficiency (FE) of pre and post-weaning dairy calves during the pre and post-weaning periods. For this purpose, a database Meta-analysis used in the present study. Statistical analyses were performed using PROC MIXED in SAS software. Starter intake and ADG were not affected by alfalfa hay feeding level during the pre-weaning period. However, alfalfa hay feeding tended to increase starter intake during the post-weaning and entire periods ($P = 0.07$ and $P = 0.09$, respectively). Further, ADG increased during the post-weaning and entire periods with alfalfa hay supplementation. Starter intake and ADG quadratically affected by the level of alfalfa hay supplementation. At pre-weaning period, feed efficiency tended to decrease ($P = 0.06$) with alfalfa hay supplementation, but was not different with control group during the post-weaning and entire periods. In addition, partial replacement of corn with other grains increased ($P < 0.01$) starter intake of dairy calves, but feed efficiency decreased ($P < 0.01$). Based upon the findings of the present research, alfalfa hay supplementation up to 7.5 percent of the total diet could improve starter intake and ADG in dairy calves at post-weaning period. Further, it is possible to replace corn with other grains, up to 50 percent, without any negative effect on neonatal dairy calves performance.

Keywords: Alfalfa hay, Calves performance, Corn grain, Meta-analysis, Starter



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Effects of processing with gamma ray, sodium hydroxide and calcium oxide on gas production parameters and digestibility of soybean straw

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Abstract

This research was conducted to determine the effect of gamma ray (GR) (100 and 150 kGy), sodium hydroxide (50 g/kg DM) and calcium oxide (160 g/kg DM) on gas production parameters and *in vitro* digestibility of soybean straw. All treatments, except for the gamma ray (100 and 150 kGy) did not have gas production up to 4 hours after incubation and there was a lag time. From 8 to 96 hours of incubation, the highest gas production was observed in sodium hydroxide + gamma ray (100 and 150 kGy) treatments ($P < 0.05$). Processing had no effect on gas production rate ($P > 0.05$), but increased gas production potential (b) ($P < 0.05$). The highest amount for b fraction was observed in sodium hydroxide + GR (100 and 150 kGy) treatment. Organic matter digestibility (OMD), metabolizable energy (ME), net energy (NE) and short chain fatty acids (SCFA) increased by processing ($P < 0.05$). The highest increase was observed for sodium hydroxide (100 and 150 kGy). *In vitro* digestibility of the dry matter (DM) and organic matter (OM) was increased by GR, sodium hydroxide, and their combination ($P < 0.05$). However, treatments with calcium oxide did not affect these traits. Except for GR at doses of 100 and 150 kGy, the other treatments reduced ammoniacal nitrogen ($\text{NH}_3\text{-N}$) ($P < 0.05$). Microbial mass production after 24 hours incubation showed decrease in calcium oxide and calcium oxide + GR treatments ($P < 0.05$). Based on the results of this research, nutritional value of soybean straw improves with GR and sodium hydroxide treatments.

Keywords: Calcium oxide, Digestibility, Gamma ray, Gas production, Sodium hydroxide, Soybean straw



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Investigation of treated barley grain with lactic and citric acid on performance and feeding behavior of Holstein cows

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Abstract

The aim of this study was to investigate the effect of feeding of steeped barley grain with lactic acid (LA) and citric acid (CA) on dry matter intake, feeding behavior, apparent nutrients digestibility, rumen pH and milk production. Eight early lactating Holstein cows in the second parities were used in 4×4 Latin square change-over design. Treatments consisted of basis diet containing 1) dry rolled barley grain (DR), 2) dry rolled barley grain steeped in an equal quantity of tape water alone (W), 3) or in 0.75% LA, or 4) 1% CA for 24 h. The result of this study showed that dry matter intake, feeding behavior and apparent nutrients digestibility did not significantly different among treatments. Rumen pH was greater at 6 h after feeding in LA and CA diets ($P<0.05$). Treatments had no effect on fecal score and pH. Milk and Fat corrected milk production unaffected by treated barley. While milk protein and none- solids fat were significantly greater in CA diet in compared to others ($P<0.05$). Others milk composition had not influenced by type of processing. In conclusion, treated barley grain with LA and CA had increased rumen pH 6 h after feeding but other characters including milk production and composition, apparent nutrient digestibility and feeding behavior unaffected by barley grain processing method.

Keywords: Citric acid, Digestibility, Lactic acid, Milk production



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The effect of different methods of force molting on performance and egg quality of laying hens

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Abstract

This experiment conducted to evaluate the effect of different methods of force molting on performance, egg quality of laying hens with one hundred eighty of 52-wk old Hy-line layer in completely randomized design with six treatments, five replicates for 90 days. Treatments include 1 - feed withdrawal (FW), 2 - 50 percent alfalfa meal: 50 percent layer ration, 3 - 75 percent alfalfa meal: 25 percent layer ration, 4 - 100 percent alfalfa meal, 5 - whole barley grain (WBG) and 6 - high level of zinc oxide (20000 ppm) that were used for 10 days. The highest percentage of weight loss was observed in FW and zinc oxide groups ($P<0.05$). Egg production of birds that fed 50 percent alfalfa meal: 50 percent layer ration stopped later and reached to 50 percent egg production sooner than the other treatments ($P<0.05$). The WBG and 100 percent alfalfa meal had better egg production feed conversion ratio in compare to FW birds ($P<0.05$). The mean egg weight observed higher in FW group and egg yolk color was higher in FW and WBG groups in compare to the other treatments ($P<0.05$). The WBG and zinc oxide groups had highest eggshell percentage ($P<0.05$). According to the results of this experiment it seems that WBG and 100 percent alfalfa meal groups are the useful methods for force molting because of improving performance parameters of layers.

Keywords: Alfalfa meal, Body weight loss, Whole barley grain, Yolk Color, Zinc oxide.



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The effect of camphor levels on the Japanese quail performance, thyroids and testosterone hormones

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Abstract

This study was conducted to evaluate the effect of camphor levels on performance, organ weight, testosterone and thyroid hormones, intestinal selective bacteria, and meat peroxidation of Japanese quail. Two-hundred 1-d chicks were allocated in 20 cages with five treatments and four replicates (10 chicks per each cage) using complete randomized block design. Treatments were including: 0, 62.5, 125, 250, and 500 ppm camphor which dissolved in soybean oil. Blood sample was taken then quails were slaughtered at 42-d of age. Results revealed camphor unaffected the carcass and organs weight. Also feed conversion ratio, feed intake, live body weight, and thyroid hormones unaffected by using camphor supplementation in the diet. Results showed that camphor could enhance libido by increasing the production and secretion of testosterone ($P < 0.05$). Dietary camphor had a significant effect on the intestinal microbial population, so that could reduce the aerobic bacteria and coliforms, whereas increased the lactic acid bacteria and spore former bacteria ($P < 0.05$). Meat malondialdehyde level has been also changed significantly in both sexes by camphor dietary supplementation, which increased by using 62.5, 125, and 250 ppm camphor ($P < 0.05$). According to the current results, using camphor is recommendable for successfully reproduction in male birds.

Keywords: Camphor, Japanese quail, Oxidation, Performance, Testosterone



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Effect of different level of commercial multi enzymes on wheat metabolizable energy and nutrient digestibility

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Abstract

The purpose of this study was to determine the effect of two levels of four commercial multi-enzymes on the apparent metabolizable energy corrected for nitrogen (AME_n) and digestibility of crude fat, crude protein, dry matter, and organic matter in broiler chickens through total excreta collection method. One hundred thirty male broiler chicks were assigned to 45 metabolic cages involving 9 treatments, and 5 replicates of 3 chicks each. A control diet was made so that wheat was the sole source of energy supply. Eight experimental diets were prepared with the addition of one or two recommended levels of each commercial multi-enzymes to the control diet. The chickens had free access to feed and water ad-libitum from 17 to 23 days of age. Gross energy, crude protein, crude fat, organic matter, and dry matter were measured in feed and excreta samples. Addition of one or two recommended levels of different commercial enzymes to diet significantly increased ($P < 0.05$) AME_n and apparent digestibility of fat, protein, dry matter, and organic matter in wheat. However, there was not a significant difference between the levels and the four types of added commercial enzymes on AME_n and nutrient digestibility values. The results revealed that metabolisable energy value of Falat wheat improved by 70 to 120 kcal per kg, regardless of the type and activity of the four commercial enzymes used in this study.

Keywords: broiler chicken, commercial multi-enzymes, digestibility of nutrients, metabolizable energy, wheat



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Effect of dietary supplementation with natural zeolite and nano-zeolite on gut flora, tibia bone characteristics and performance of broiler chickens

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Abstract

Effect of natural zeolites and nano-zeolite on gut flora, tibia bone characteristics, blood parameters and performance of broilers investigated with 336 male Ross 308 broilers chicks allocated to seven treatments with four replicates and 12 chicks per each. Experimental treatments were control (no zeolite supplemented), natural zeolite (0.5, 1 and 1.5 percent) and nano-zeolite (0.5, 1 and 1.5 percent). Experimental diets had no significant effect on relative weight of breast, thighs, liver, abdominal fat, gizzard and carcass efficiency. Zeolite and nano-zeolite supplementation led to significant decrease of total bacteria and *E. Coli* population ($P<0.05$). Experimental additives did not show effect on weight, length, volume and density of fresh and dry tibia. Nano-zeolite inclusion increased phosphorus, ALP and AST amounts compared to control group ($P<0.05$). It could be concluded that nano-zeolite inclusion in broiler diet, promote gut microflora and increased hepatic enzymes activity.

Keywords: Additive, Broiler, *E. Coli*, Hepatic enzymes, Nano-zeolite



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Effect of feeding fermented cottonseed meal on growth performance, carcass characteristics and blood serum lipid profile of broiler chickens

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Abstract

The effect of feeding fermented cottonseed meal on performance, carcass characteristics and blood serum lipid profile was studied in a completely randomized design with five treatments, five replicates and 12 birds per replication using 300 male Ross 308 broiler chicks. Raw cottonseed meal was fermented with a liquid mixed culture containing *Bacillus subtilis*, *Aspergillus niger* and *Aspergillus oryzae* with a ratio of 1:1:2. After seven days of fermentation, free gossypol was reduced from 584.33 to 68 mg/kg. The experimental treatments included replacing 0, 10, and 20 percent of the raw or fermented cottonseed meal by the soybean meal in the diet. The use of fermented cottonseed meal in the diet improved weight gain and feed conversion ratio of broilers compared to the raw cottonseed meal ($P<0.05$). At 21 and 42 d, weight gain and feed conversion ratio of the birds fed diets containing 10 and 20 percent of fermented cottonseed meal did not have a significant difference with the birds fed by the control diet. Abdominal fat was lower in birds fed diets containing fermented cottonseed meal compared with the others ($P<0.05$). Serum concentrations of cholesterol and triglyceride were significantly lower for the birds fed by diets containing fermented cottonseed meal, compared with the other groups ($P<0.05$). Based on the results, the use of fermented cottonseed meal improves the performance and health of broiler chickens compared to the raw cottonseed meal.

Keywords: *Bacillus subtilis*, Broiler, Cottonseed meal, Free gossypol, Performance



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The effect of diet acidified with hydrochloric and butyric acids on performance of female broiler chickens

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Abstract

The aim of this experiment was to study the effects of hydrochloric and butyric acids addition to broiler diets on performance, carcass characteristics, intestinal microbial population and intestinal histology. Two hundred eighty Ross 308 one-day old female broiler chicks were assigned to 7 dietary treatments and 4 replicates of 10 chicks in a completely randomized design. Experimental treatments consisted of dietary addition of 2 levels of hydrochloric acid (1.5 and 3 percent), 2 levels of butyric acid (0.2 and 0.4 percent) and 2 levels of the acids mixture (1.5 + 0.4 and 3 + 0.2 percent) and a treatment with no acid supplementation as control group. Dietary hydrochloric and butyric acids during grower period decreased average body weight, significantly ($P < 0.05$) in compare to control group. Supplemented acids, decreased feed intake and increased feed conversion ratio in the grower period in compare to control group, significantly ($P < 0.05$). Acid treatments had no significant effect on carcass characteristics, microbial count of ileum and histology of the small intestine of broiler chickens in compare to control group. It could be concluded that using of hydrochloric and butyric acids in broiler diets have no positive effect on growth performance, carcass characteristics and morphology of the small intestine of broiler chickens.

Keywords: broiler, butyric acid, carcass characteristic, histology, hydrochloric acid, performance



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Effect of adding pomegranate peel powder to fat-containing diets on performance of broilers

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Abstract

In order to investigate antioxidant and antimicrobial effects of pomegranate peel powder (PPP), this research was conducted as completely randomized design arranged in a 2×2 factorial experiment using pomegranate peel powder (0 and 2 percent) and soybean oil (SO, zero and six percent in growing period; zero and eight percent in finishing period). One hundred and sixty 11-day-old Ross 308 broiler chickens assigned to four treatments of four replicate each. The results showed that PPP improved the antibody titer in 39-day broilers, increased fat digestibility, improved lactobacillus and decreased E coli micro flora in ileum and cecum significantly ($P \leq 0.05$). The SO decreased DM digestibility and lactobacillus micro flora and E coli in ileum and cecum ($P \leq 0.05$). As a conclusion adding PPP to the fat containing diets in comparison to control diets; without PPE and SO, improved antibody titer, beneficial gastric micro flora in ileum and cecum and had not any deleterious effect on overall broiler performance.

Keywords: Antibody titer, Digestibility, Fat, Micro flora, Performance, Pomegranate peel powder



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Improvement in sorghum grain digestibility by removing tannin and feed formulation method using standardized amino acid digestibility in broilers

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Abstract

The aim of this study was to investigate the processing methods of sorghum grain and diet formulation on performance and nutrients digestibility in broilers. Three hundred and twenty chicks at eight day of age were allotted into eight groups of four replicate with ten chicks per replicate. This research was conducted as completely randomized design arranged in a $2 \times 2 \times 2$ factorial experiment using formulation method (total vs. digestible amino acids), Polyvinylpyrrolidone (PVP, 0 vs. 1%) and acid treatment (0 vs. 2%, acetic and propionic acid, 60:40 mixture). Main effects of addition of PVP and acid treatment of sorghum and formulation based on digestible amino acids significantly improved feed conversion ratio and average daily gain during the finishing period (22 to 42 d.) and the overall feeding periods (8 to 42 d.; $P \leq 0.05$). Also, acid treatment of sorghum and formulation based on digestible amino acid significantly improved nutrients digestibility during the finishing period (22 to 42 d.) and the overall feeding periods (8 to 42 d.) ($P \leq 0.05$). Addition of PVP or acid treatment resulted in a decrease in the weight of pancreas ($P \leq 0.05$). The interaction effect of PVP, acid and method of diet formulation was not significant on any performance parameters. The data showed that diet formulation based on digestible amino acid can be more advisable in comparison to sorghum grain processing methods. It can be because of no need for additional processing costs and having the same performance results.

Keywords: Acetic acid, carcass, performance, polyvinylpyrrolidone, propionic acid, tannins.



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Effect of different levels of Zilpaterol hydrochloride in three weeks of growth finisher on growth performance in Japanese Quails

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Abstract

The purpose of this study was to evaluate the effect of Zilpaterol hydrochloride on the growth performance, carcass quality and blood parameters with 128 male quails at 26 days of age were divided into four treatments which each treatment consists of four replicates of 8 birds. The birds received daily 0, 0.2, 0.225, or 0.25 mg/kg of live weight d-1 zilpaterol. After three days of withdrawing zilpaterol, two birds were slaughtered for carcass evaluation. Results showed that zilpaterol hydrochloride supplementation improved feed conversion ratio (FCR) ($P < 0.5$), but no effect on feed intake and weight gain. Also, zilpaterol hydrochloride increased the glucose and triglyceride concentration of plasma in comparison to treatment control ($P < 0.5$). However, zilpaterol had no effect on carcass chemical composition (crude protein, fat, cholesterol). Furthermore, carcass weight and percentage of leg, breast, liver and abdominal fat was not affected in the treatment which were feeding zilpaterol hydrochloride. It can be concluded that Zilpaterol hydrochloride improved the FCR in Japanese Quails

Keywords: Beta-adrenergic, Bird, Blood plasma, Carcass quality, Growth performance



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Evaluation the effect of soybean lecithin in tris extender on spermatozoa quality and viability of ram

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Abstract

The Effect of various amount of soybean lecithin replaced with egg yolk to protect the ram semen in times of one hour after semen collection, as well as 24 and 48 hours after the semen store at 5°C was evaluated. Semen was collected weekly for 8 weeks from 10 rams with 2-3 years old and average body weights of 64 kg. Semen samples were pooled and divided into 4 parts. Each part was diluted with one of the tris base extender containing 0.5, 1 and 1.5 percent of soybean lecithin and 14 percent of egg yolk. The motility, viability, morphological abnormalities and membrane integrity of spermatozoa and pH of semen were evaluated. The results showed that 1.5 percent of soybean lecithin improved the motility and viability of spermatozoa at the first time ($P < 0.05$). At the 48 hours after the semen store in 1 and 1.5 percent of soybean lecithin the sperm viability improved when compared with egg yolk treatment ($P < 0.05$). Overall, soybean lecithin is the appropriate replacement with egg yolk and improved the semen quality in times of study. With regard to limitations of egg yolk using with animal source in ram extender, it was recommended to be using the soybean lecithin as the plant source.

Keywords: Lecithin, Morphological abnormalities, Semen diluent, Sperm quality, Sperm viability



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Effect of olive leaf extract on rooster semen storage

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Abstract

Antioxidant effect of olive leaf extract (OLE) was studied on motility, viability, plasma membrane integrity of spermatozoa and malondialdehyde production in 12 Ross 308 roosters at their 30 weeks of age. Semen samples were collected by abdominal massage in 5 times. In each session after the initial sperm assessment, collected samples were pooled and diluted with Sexton extender. Samples were split into five parts and the concentrations of 0 (control), 50, 100, 150 and 200 $\mu\text{g/mL}$ OLE were added to each part, then, the samples were incubated for 72 hours at 4 degree Celsius. Progressive motility, viability and plasma membrane integrity were evaluated at 0, 24, 48 and 72 hours of storage and production of malondialdehyde were analyzed after 48 hours of storage. Adding 100 $\mu\text{g/mL}$ OLE to semen reduced malondialdehyde production ($P<0.05$). Using 100 $\mu\text{g/mL}$ of olive leaf extract, progressive motility, viability and plasma membrane integrity of sperm were higher compared to the control group after 48 and 72 hours of storage ($P<0.05$). Using 200 $\mu\text{g/mL}$ of olive leaf extract, progressive motility, viability and plasma membrane integrity of sperm were lower compared to the control group after 72 hours of storage ($P<0.05$). Based on the results of this research, adding 100 $\mu\text{g/mL}$ OLE to diluent is recommended for rooster sperm storage at 4 degree Celsius.

Keywords: Antioxidant, Malondialdehyde, Olive, Rooster, Spermatozoa



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Comparing reproduction and production parameters in managing program of two and three birth times during two years using melatonin in ewes

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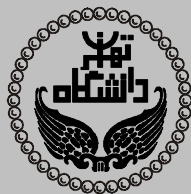
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Abstract

Using melatonin in ewes of Iran black breed, this study aimed to compare the reproduction and production performances in lambing program of two and three times per years for duration of two years. A hundred ewes allocated to two parallel groups: Group A (ewes in three lambing managing system using melatonin) and Group B (ewes in two lambing managing system without using melatonin). To induce the estrus synchronization of ewes of Group A, 40 days before their first and second mating, melatonin implant was placed under the ear skin of these animals. Due to the decrease of birth interval in Group A, ewes of this group were dried off two weeks before mating. The nutritional flushing and ram effect were used to improve the ovulation rate in Groups of A and B, before mating. Reproduction and production parameters including estrus, ovulation, pregnancy, lambing rates and lambs weight were compared between two groups during two years. Our results indicated that the reproductive and productive performance of Group A was higher in first mating as compared to their second and third mating. The ovulation, pregnancy, lambing rate and lambs weight during two year was higher in Group A in comparison to Group B. Collectively, our findings indicated that the ewe's production and reproduction performance in three lambing managing system with the use of melatonin were more efficient compared to the ewes in two lambing managing system without using melatonin.

Keywords: Ewe, Implant melatonin, Lambing rate, Lamb weight, Multiple birth



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Effect of bovine serum albumin on sperm motility parameters and fertility of indigenous rooster

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Abstract

In this Research, effect of bovine serum albumin (BSA) on motility and fertility of indigenous rooster spermatozoa was evaluated using 20 and 48 indigenous roosters and hens, respectively. Semen was collected and pooled. In the first experiment, the pooled semen was diluted and divided into four aliquots. The treatments were included the diluted semen without BSA and with 1% BSA; In each group, spermatozoa motility was evaluated during 30 minutes of semen collection and 24 hours after semen storage in 4°C. Spermatozoa motility parameters were evaluated by computer assisted sperm analysis and routine methods. In the second experiment, hens were divided into 4 groups with 12 hens in each group and fresh diluted semen without BSA and containing 1% BSA as well as stored diluted semen without BSA and containing 1% BSA were inseminated. The eggs were incubated and proportion of fertile egg in each treatment group was recorded. By adding 1% BSA into the diluted semen of indigenous rooster, sperm motility parameters and fertility rate were not affected in fresh semen. However, after 24 hours of semen storage in liquid condition, BSA significantly preserved motility and fertility potential of spermatozoa ($P < 0.05$). In conclusion, BSA improved the spermatozoa motility and fertility of indigenous rooster in liquid storage for 24 hours.

Keywords: Artificial insemination, BSA, Fertility, Indigenous chicken, Reproduction