Effects of Dietary Crude Protein and Lysine Levels on Performance and Apparent Nitrogen Retention in Broiler Chickens

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Abstract
An experiment was conducted to evaluate the effects of dietary crude protein (CP) and lysine levels on performance and nitrogen excretion in broiler chickens. Four hundred twenty 7-day old chickens from Ross 308 strain were randomly allotted to 6 dietary treatments with 5 replicates of 14 chicks each (7 male and 7 female chicks). The CP levels were 17, 18, and 20 percent and lysine levels were 1.3 and 1.1 percent of experimental diets. Data were analyzed in a completely randomized design as a 2×3 factorial arrangement. Experimental diets were offered ad libitum during starter (7-21 d) and grower (21-42 d) periods. At the age of 42 to 45 days, 2 birds placed in battery cages and their Excreta was totally collected to determine apparent nitrogen retention. Results of the present study showed that the CP levels had a significant effect on feed intake, weight gain, and nitrogen excretion. Among carcass parts only wings weight was affected significantly by the CP levels. The CP levels of 20 and 17 percent resulted highest and lowest nitrogen excretion, respectively. Interaction between CP and lysine had a significant effect on feed intake and N excretion. Chicks fed diets containing 20% CP and 1.1 % lysine showed significantly more feed intake as compared to other groups. The 17% CP and 1.3% lysine diets resulted lowest and highest nitrogen excretion, respectively. In general, best performance results was observed by experimental diets containing 20 % CP and 1.1% lysine but this diet resulted most N excretion among the experimental diets.

Keywords: Crude protein, Lysine, Performance, Broiler, Nitrogen excretion

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Effect of Dietary Crude Protein and Methionine on Egg Production and Egg Quality of Laying Hens During Phase II

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Abstract

An experiment was conducted to evaluate the effect of dietary crude protein and methionine levels on quality and quantity of egg production. Fifteen diets formulated with 3 levels of protein (13, 14 and 15%) and 5 levels of methionine (0.25, 0.28, 0.31, 0.34 and 0.37%) and fed to 420 birds in a 3×5 factorial arrangement. Each diet was randomly fed to 4 replicates of 7 birds each and fed for 3 periods of 4 weeks (50-62wks of age) each. Egg number and mortality was recorded daily, whereas feed consumption determined at the end of each period. The increased in dietary protein significantly increased egg production from 54 to 59.4%. Egg weight, egg mass and feed intake increased by 1.7 g, 3.4 g, and 2.8 g, respectively during the whole experimental period. As the dietary protein increased, feed conversion, egg component (as a percent of whole egg) and egg albumin percent were improved. However, the egg breaking, specific gravity and eggshell were significantly decreased with increased dietary protein. The egg yolk percent was not influenced by dietary protein levels. The increased in dietary methionine from 0.25% to 0.37% caused the overall egg production, egg weight, egg mass, feed intake and egg component to improve by about 8.2%, 4g, 6.6g, 8.7g, and 6.0g, respectively. Feed conversion, specific gravity, egg breakage, egg shell, and egg yolk and albumin percent were not influenced by dietary methionine levels.

Keywords: Laying hen, Protein, Methionine, Egg production, Egg quality
Effect of Lighting Programs on Performance, Carcass and Production Costs of Arian Broilers

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Abstract

Light is an environmental factor, which has profound influences on broilers performance and frequently overlooked management practices. This study was conducted to compare the effects of different lighting programs on growth, carcass parts and economical performance using 320 one day-old broilers (Arian 386) in completely randomized design with 4 treatments and 8 replicates per each treatments (10 birds for each replicate). The four lighting schedules under study were: 1- continuous lighting (control), 2- decreasing-sudden increasing lighting, 3- decreasing-gradual increasing lighting and 4- intermittent lighting (1 light: 3 dark). Feed intake, body weight, feed conversion ratio, mortality and production index of birds raising under different lighting schedules were compared during six weeks of experimental carrier. Final body weight and total feed consumption were the same for all birds regardless of lighting schedules applied (P>0.05). Intermittent lighting significantly improved feed conversion ratio and decreased mortality rate compared to other lighting schedules (P<0.05). The mortality rate was significantly reduced in gradual increasing group (P<0.05). Carcass parts had not influenced by lighting schedule (P>0.05).The highest economic profit was related to intermittent lighting schedule group (P<0.05). In conclusion, it seems that implication of some limitation in lighting hours is a practical tool for promotion of broilers performance and furthermore would reduced production costs and will promote economic profits. The results of this experiment emphasized the application of intermittent lighting schedule for Arian broilers.

Keywords: Arian broilers, Lighting program, Performance, Carcass, Economic profit

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Effect of Different Levels of Methionine on Performance of Khorasan Station Native Hens at Different Production Stages

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Abstract

To investigate the effects of different levels of the amino acid methionine (Met) on performance of birds native Khorasan province, an experiment using 300 pieces of chicken native Station Native chickens Khorasan in the form of designs completely randomized design with 6 treatments, 5 replicates and 10 chickens in each replicate from age 26 till 52 weeks implemented. 6 treatments follows that the first treatment of Met to 0.22% received the basal diet (control) and other treatments to Met level of 0.1% in each treatment and were increased so that the six birds different Met (0.22, 0.32, 0.42, 0.52, 0.62 and 0.72 percent) received. The results showed that the Met levels increase the total weight of eggs produced in the experimental period (P<0.05). Increased egg weight by adding supplemental Met levels was a direct relationship so that the egg weight in the group receiving 0.72% Met than the control group increased about 7 grams. Levels 0.62 and 0.72 % Met improved the percentage of egg production (EP) and this increase in the end weeks of experiment was clearly. Feed consumption also was influenced by supplemental Met and groups who received the highest level of supplementation, compared to other groups, a significant decrease (P<0.05) showed. Reduced feed intake in early weeks of testing were more remarkable. Levels of the amino acid Met supplementation caused a significant decrease in shell weight percent were between 26-38 weeks and 38 till 52 weeks showed no significant effects. Other internal components, including egg white and yolk were not affected except that the weight of albumin at a distance ranging from 34 to 38 weeks in the group receiving the highest Met level increased. Overall, the results of this study showed that increasing levels of the Met is produced improved egg weight and ideal level for increase egg weight was 0.62% Met.

Keywords: Methionine, Native layer hens, Performance, Requirement

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Effect of Vitamin C on Performance, Egg Characteristics and Some Blood Parameters of Laying Hens

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Abstract

This experiment was conducted to evaluate the effects of vitamin C on laying hens performance, egg characteristics and some blood parameters under normal rearing condition. One hundred and ninety two 24-weeks-old laying hens diet were used in a completely randomized design with 4 treatments (0, 250, 500 and 750 mg vitamin C/kg diet) and 4 replicates for 105 days. Although feed consumption, feed conversion ratio and hen-day egg production were similar among treatments (P>0.05), final body weight was significantly increased (P<0.01) with 250 and 750 mg vitamin C/kg diet. Albumen index and Hough unit (HU) were greater in groups fed 750 mg vitamin C/kg diet (P<0.05). In addition increasing yolk height and yolk index were found in diet supplemented with 500 mg vitamin C/kg diet (P<0.05). In terms of blood parameters no significant differences were observed in blood glucose and calcium concentration between groups. However the plasma uric acid decreased by 250 mg vitamin C/kg diet (P<0.05). Results of this study showed that vitamin C increased body weight and improved albumen and yolk quality and decreased plasma uric acid in laying hens.

Keywords: Vitamin C, Egg characteristics, Laying hens performance, Blood parameters

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Effect of Fennel and *Thymus vulgaris* Extracts with and without Flaxseed on Performance and Eggs Quality of Laying Hens

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Abstract

This experiment was conducted to evaluate the effects of fennel and *Thymus vulgaris* extracts with and without flaxseed on performance and egg quality of laying hens (Hy line W-36). The experiment was conducted in a completely randomized design with 200 laying hens in 5 treatments and 5 replicates (with 8 hen in each replicate) for 12 weeks. The hens were fed isocaloric and iso nitrogenous diets according to NRC 1994 but differ in the plant extracts. The plant extracts used in this study consisted of an alcoholic extract of fennel and thyme that the value of 40 ml/kg feed was sprayed. The results of this study showed that egg production, egg mass and feed conversion ratio not significantly but feed consumption and egg weight has significantly effects (P>0.05). The index of yolk color in the group received *Thymus vulgaris* and flaxseed was significantly different from other treatment groups (P<0.05). In entire period, Haugh unit in the treatment contained *Thymus vulgaris* was highest (P<0.05). The shell strength in diets contain plant extract was higher than control treatment (P<0.05). The egg weight in diets contain flaxseed significant difference than other treatments (P<0.05). The experimental diets has significantly effect on palmitic acid, estearic acid and linolenic acid values (P<0.05), but on oleic acid and linoleic acid has not significantly effect. The results of this experiment showed that extracts of thyme and fennel laying hens performance and egg quality factors and using flaxseed with thyme yolk fatty acids and cholesterol had improved.

**Keywords:** Plant extracts, Laying hens, Egg quality, Performance

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Effect of Forage on Rumen Development and Performance of Newborn Balouchi Lambs

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Abstract

An experiment was conducted by incorporating 35 newborn Balouchi lambs to study the effects of different type and levels of forage in starter diets on rumen development characteristics and performance. The 5 experimental treatments were included; starter diet without forage (control) and starter diet containing two levels (7.5 and 15%) of alfalfa hay and wheat straw. Inclusion of forages increased abrasive value (P=0.001), average particle size (P=0.006), pNDF (P=0.0002), BUN (P<0.001) and stomach weight (P=0.002) and capacity (P<0.001) and decreased BHBA (P<0.001), dry matter intake and bad feed efficiency (P<0.001) in starter period. Inclusion of forage resulted to decrease of keratinized layer and increased muscular layer thickness. Thinnest keratinized and thickest muscular layers were observed in treatment 3. The rumen weight were higher in treatment 5 (15% wheat straw) and were lower in animals that fed control diet. Inclusions of forage don't affect DMI, FCR, glucose and BUN concentrations in growing period. However, lambs that fed by 15% wheat straw had lower DMI. Carcass characteristics and internal organs weight don’t affect by treatments. This tendency observed in intestine and rumen weight and their capacity. In conclusion it seem that the concentration of volatile fatty acids (VFAs) in rumen (feeding concentrate feeds) is premier factor in rumen development, although forage roles in physical development and maintain of stable condition in rumen wasn't negligible.

Keywords: Balouchi lamb, Rumen, Forage, Performance

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The Comparison of Rumen Fungi Quantification in the Medium Containing Sunflower Meal Treated with Formaldehyde and or Sodium Hydroxide by Using Quantitative Competitive PCR

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Abstract

The method of quantitative competitive polymerase chain reaction (QC-PCR) was conducted to compare the number of rumen anaerobic fungi in pure culture of fungi containing high fat sunflower meal (165 g fat/kg DM) processed with formaldehyde and NaOH. Twenty one multiparous early lactating Holstein cows (30±5 days of lactation) selected and fed experimental diets for 7 weeks. The diets were including untreated sunflower meal (control, n=3) and treated 4 % sodium hydroxide (n=3) and treated with 0.3 and 0.6 % formaldehyde (n=3). Competitive PCR technique was used to evaluate quantitative difference of anaerobic fungal population in the rumen under the dietary treatments. Standard control DNA was constructed from lambda phage for use in the competitive PCR and was shown to amplify under the same reaction condition and with the same amplification efficiency as the target DNA. The relative intensities of PCR products were used to evaluate variety of fungal population under fed treatments. The analysis of data of present study showed that NaOH treated sunflower meal increased and formaldehyde treated sunflower meal decreased number of fungi in medium compared to control. Therefore it seems that QC-PCR method has appropriate efficacy for enumerating rumen fungal population under the effect of dietary treatments.

Keywords: Sunflower meal, Sodium hydroxide, Formaldehyde, Rumen fungi, QC-PCR

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Effect of Supplemental Dietary Fat and Processed Barley Grain on Performance of Lactating Dairy Cow

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Abstract
The effect of barley grain processing and source of supplemental fat on performance of lactating dairy cows were studied in a replicated 4 × 4 Latin square design with 21-d periods and a 2 × 2 factorial arrangement. Eight Holstein cows with mean body weight (BW) of 572 ± 71 kg and 45 ± 10 days in milk were allocated to 4 dietary treatments including 1) ground barley with cottonseed 2) pelleted barley with cottonseed 3) ground barley with canola seed 4) pelleted barley with canola seed. The nitrogen intake and fecal N were higher in cows fed ground barley in comparison with those fed pelleted barley. Source of supplemental fat or barley processing had no effect on milk fat and milk protein contents. Milk SNF yield was higher in cows fed canola as supplemental fat source and ground barley (P < 0.05). Milk yield was affected by method of barley grain processing and was 0.64 to 1.9 kg/d higher in cows fed ground barley compared with those fed pelleted barley (P = 0.04). Plasma concentrations of glucose, NEFA, BHBA, cholesterol, triglycerides and blood urea nitrogen were similar in all treatments. Dry matter intake was affected by barley grain processing. The cows fed ground barley consuming 1.15 to 2.18 kg/d more DM compared with those fed pelleted barley (P = 0.04). Total tract digestibilities of DM, crude fat, ADF, NDF and OM were not affected by the barley grain processing as well as source of oilseed. The results indicated that interactions between barley grain processing and source of supplemental dietary fat can improve the performance of lactating dairy cows, However, more detailed studies are required.

Keywords: Supplemental dietary fat, Processed barley, Milk yield, Milk composition, DMI

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The Polymorphism of Exon 2 of GOLA-DRB3 Gene in Nadushan Goat Using PCR-RFLP

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Abstract

This study was conducted to determine polymorphism of GOLA-DRB3 in Nadushan goat using PCR-RFLP. Blood samples were randomly taken from 100 goats. DNA was extracted from the blood samples using DIAtom DNA prep Kit. Spectrophotometer and 1% agarose gel were used for determining its quantities and qualities. Exon 2 of DRB3.2 gene encompassing 285 bp was amplified with heminested-PCR method in two rounds and PCR products were digested with TaqI. Digested PCR products were electrophoresed in 10% Acryl Amide gel or 2% Agarose gel and gels stained with ethidium bromide. Digested PCR products with TaqI included 2 fragments at 122bp and 163bp (T restriction pattern) or undigested fragment at 285bp (t restriction pattern). Population was in Hardy-Weinberg equilibrium (p>0.05). Shannon index, Nei index, observed and expected heterozygosity were 0.68, 0.49, 0.55 and 0.49, respectively. With regard to results of this study, GOLA-DRB3 marker has good efficiency for genetic diversity determining. Using results of this study and former studies and records and quantitative information of locus in this population, we can perform determining and identifying QTL.

Keywords: GOLA-DRB3 gene, Nadushan goat, PCR-RFLP

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Genetic and Trend Evaluation of Productive and Reproductive Traits of Dairy Cattle in Razavi Khorasan Province by Using Multivariate Analysis

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Abstract

In this study, Data comprising 10479 production and reproduction records of Razavi Khorasan province’s dairy cattle, were collected by Animal Breeding Center of Iran during 1986 to 2006, were used. Genetic parameters were estimated by Restricted Maximum Likelihood procedure using WOMBAT software. Genetic and phenotype trends were estimated via linear regression as means genetic and phenotype value on year of calving. Estimates of Heritability for age at first calving (AFC), calving interval1 (CI1), calving interval2 (CI2), dry period (DP), milk yield (MILK305) and fat yield (FAT305) were 0.07±0.02, 0.03±0.01, 0.06±0.02, 0.04± 0.02, 0.31±0.01 and 0.18±0.02 respectively. Genetic correlations of MILK305 and FAT305 with AFC, CI1, CI2 and DP were -0.38, 0.89, 0.55, 0.02, -0.39, 0.82, 0.52 and 0.04 respectively. Regression coefficient for Genetic trend of MILK305, FAT305, DP, AFC, CI1 and CI2 were 8.68±2.5, 0.11±0.07 (Kg/year), 0.01±0.001, -0.23±0.15, 0.13±0.04 and 0.1±0.06 (days/year) respectively and Phenotypic regression coefficients for these traits were 147.51±12.14, 6.71±0.36 (Kg/year), -0.1±0.001, -5.85±3.2, 0.7±0.06 and 1.29±0.9 (days/year), respectively.

Keywords: Reproductive trait, Production trait, Genetic parameter, Razavi Khorasan Holstein cows

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Estimation of Genetic Parameters for Milk Yield Using Random Regression Test Day Model in Iranian Holstein Cattle

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Abstract

In this study a total of 171,360 monthly test day milk records obtained from first lactation of Iranian Holstein cattle (three times a day milking) distributed in 96 herds and calved from 1999 to 2008 were used to estimate genetic parameters and to predict breeding values of the animals. The data was analyzed using Random Regression Test Day Model. The results showed that average of heritability for the second half of lactation period was higher than that of the first half. The heritability value for the first month was lowest and for the eighth and ninth months of the lactation was highest compared to the other months of lactation. The genetic correlations between monthly test day records decreased by increasing the distances between months of lactation.

Keywords: Genetic parameters, Iranian Holstein cows, Random Regression, Test day

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Evaluation of Environmental Effect on Baluchi Lamb Survival between Birth day and Weaning

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Abstract

Lamb survival is one of the major factors affecting overall sheep productivity. Lamb survival affected by environmental effect such as management, birth-type, year, season of birth, dam-age, maternal behavior, genotype of parents, and birth-weight. The data comprised 9989 records were collected from 1989 to 2009 in Iranian Baluchi sheep at Abbasabad sheep breeding station. Four binary traits created, value 0 was assigned for lambs dead and 1 for lambs alive at certain ages. Cumulative survival to day 10, 30, 60 and 90 (weaning) was calculated. Birth-weight, litter-size, birth-type, dam-age and birth-year considered in analysis. Statistical analyses of cumulative lamb survival at 10, 30, 60 and 90 days after birth analyzed by application of logistic model with binary response variable. Analysis of variance for cumulative survival each trait separately were analyzed using SAS with a linear model. The fixed effects of the model included dam-age, birth-year, birth-type, herd and sex. From 9989 lambs born at Abbasabad station over the period 1989-2009, There were 5147 (51.5%) lambs born as male and 4847 (48.5%) female which that 5583 (56%) lambs as singles 4239 (42%) as twins and 167 (2%) as triplet. Among the singles, 79 (1.5%) were dead at 10days after birth, 229 (4.1%), 373 (6.68%), 435 (7.8%) died at 30, 60 and 90 days after birth respectively. The results indicated survival of male lambs less than female at from birth to weaning, single and twin born lambs were more survival than triplet at each age. Lamb born from ewes 2 years old or in first parity had lowest survival compared with other parities. The least survival occurred in first parity as result of lack of maternal experiences of ewes at that stage. Average birth weight all lambs was 4.28 ± 0.7 Kg. male lambs had heavier birth weight than female lambs (4.4 ± 0.7 vs. 4.1 ± 0.6) also single born lambs (4.6 ± 0.6) heavier than twin or triplet born lambs 3.8 ± 0.6 , 3.3± 0.6 respectively . Linear and quadratic of birth-weight had significant effect on survival at 10, 30, 60 and 90days after birth. There was a curvilinear relationship between birth-weight and survival from birth to weaning. Survival for during birth to weaning maximized at 5 Kg although average birth-weight in this study was 4.3 Kg. Optimum birth-weight for survival of single, twin and triplet born lambs were 7, 5 and 4.3 Kg with (0.93, 0.93 and 0.92 %) survival compared average birth-weight at single, twin and triplet (4.6, 3.8 and 3.3 Kg) with (0.92, 0.92 and 0.91 %) survival. Female lambs had greater survival rate than male lambs at the same weight (1 to 2 %) Survival was maximized at 7 Kg birth weight for female (94 vs. 91.5% at average birth-weight) and male at 5 Kg which was only slightly heavier than average birth weight of 4.4 Kg.

Keywords: Baluchi Sheep, Survival, Birth-weight, Weaning-Weight

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Application of Wilmink’s Exponential Function in Genetic Analysis of 305-d Milk Production and Lactation Persistency in Holstein Cows of Razavi Khorasan

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Abstract

To estimate heritability and genetic trend for 305-d milk production and lactation persistency, a total of 130,668 monthly test day milk yields belonging to 15,183 first lactation Holstein cows in 131 herds and calved from 2000 to 2009 were used. To calculate 305-d milk yield as well as lactation persistency, estimated parameters of Wilmink’s exponential function were applied. The parameters of the function were estimated by SAS software. Genetic and environmental variance components and heritability of the traits were estimated by single trait animal model using DMU software. Genetic trend was estimated based upon weighted simple linear regression of average breeding values on calving year. Heritability estimate of 305-d milk yield and lactation persistency were found to be 0.184 and 0.05, respectively. A positive significant phenotypic trend (166.11 kg per year) was observed for 305-d milk yield while a non-significant genetic trend (-2.0107) was revealed for the trait. For the lactation persistency, there were no significant phenotypic (0.054 % per year) and genetic (0.003 % per year) trends over the period of time.

Keywords: Wilmink function, Heritability, Phenotypic and genetic trends, Holstein cow

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Effect of Polymorphism of some Candidate Genes from Growth Hormone Axis on Egg Production Traits in Mazandaran Native Fowls

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Abstract

In the present study the allelic polymorphisms of GH, GHR and TGFβ3 genes and its association with egg production traits were investigated. Blood samples randomly were collected from breeder hens of Mazandaran native fowls breeding station and transported to the laboratory in cold chain condition. DNA was extracted using modified salting out method and the desired loci were amplified by specific primers. All samples genotyping were carried out by RFLP-PCR method. The frequency of each (+) and (-) alleles was estimated at 0.7981 and 0.2019 for GH, 0.9937 and 0.0063 for GHR and 0.8037 and 0.1961 for TGFβ3 loci, respectively. The heterozygote genotype was detected in both GH and TGFβ3 loci but all individuals showed homozygote genotype in GHR marker site. The chi-squared test showed that all individuals in both GH and TGFβ3 loci were in HW equilibrium. Statistical analysis of showed that GH marker site had a significant effect on both phenotypic and breeding values of egg weight at puberty (EWM) and age at first laying egg (AFE), respectively. The mean comparison showed that individuals with -/- genotype in GH marker site had higher phenotypic values for EWM but lower breeding values for AFE trait. The GHR and TGFβ3 loci and also the interaction between GH×TGFβ3 loci were not statistically significant on phenotypic and breeding values of mentioned traits.

Keywords: GH, GHR, TGFβ3, Polymorphism, Native fowls

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Estimation of Some Nutritional Indices in Commercial Hybrid of Silkworm at Five Larval Instar

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Abstract

Nutritional indices have important role in economical efficiency of silkworm rearing. In order to estimate nutritional indices six silkworm hybrids including 103×104, 31×32, 107×110, 104×103, 32×31 and 110×107 which were commercially used in Iran for cocoon production were tested. These hybrids were reared in spring 2003, spring 2004 and autumn 2004. The studied parameters were amount of ingestion and facea, digested food, percentage of ingestibility and digestibility, reference ratio (ingested feed/produced feces), larva weight gain, efficiency of conversion of ingested (ECI) and digested (ECD) food into larva weight. The obtained results clearly indicate that ingestion, digestion and utilization of food were mostly dependent upon genotype and hybrid's instars. Hybrids E and F at instars 1-3 and instars 4-5 duration ingested less food. Food ingestion was different at the same season of different years. Meanwhile this index have many alteration upon rearing season. At spring season, the first and third instar larvae obtained the most ingested foods. At autumn season, other instars obtained the most ingested food. Ingested food amount affected by larval duration and also by climatic conditions especially rearing season. Hybrids E and F had the highest digestibility in comparison with other hybrids. Comparisons of common hybrids (A, C and E) against the reciprocal hybrids (B, D and F) for percentage of ingestibility and digestibility is showed Japanese hybrids have nutritional indices higher than Chinese hybrids. But at instars 4-5 these results were reverse i.e. Chinese-maternal based hybrids have nutritional indices higher than Japanese-maternal based hybrids. Obtained results are showed nutritional indices were different in various silkworm hybrids and it must be noticed to hybrid production based on nutritional characteristics.

Keywords: Silkworm, Digestibility, Gain, Season

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