



Journal of
Animal Production

(College of Abouraihan – University of Tehran)

Vol. 17 ■ No. 2 ■ Autumn 2015-Winter 2016

Using of stochastic simulation for determine of appropriate breeding plan in Sistani breed cow

Fatemeh Mir¹, Mohammad Rokouei^{2}, Gholamreza Dashab³ and Hadi Faraji-Arough⁴*

1. M.Sc. Graduate, Department of Animal Science, Faculty of Agriculture, University of Zabol, Zabol, Iran
2. Associate Professor, Department of Animal Science, Faculty of Agriculture, University of Zabol, Zabol, Iran
3. Assistant Professor, Department of Animal Science, Faculty of Agriculture, University of Zabol, Zabol, Iran
4. Assistant Professor, Research Center of Specific Livestock, University of Zabol, Zabol, Iran

Received: March 2, 2015

Accepted: May 26, 2014

Abstract

The aim of this study was to design the base breeding plan in Sistani cattle by using of stochastic simulation. For this purpose, three population size (500, 1000, 2000 heads), three levels of herd number (5, 10, 20), two levels of selection intensity (high and low) and two levels of mating method (random and Minimum co-ancestry) were combined together and in total 36 scenarios were compared for 30 years. Results showed that the effect of all factors on the annual genetic gain for total merit, the annual genetic gain of birth weight (except in mating method and selection intensity) and yearling weight, the annual inbreeding rate (except in herd number), generation interval (except in mating method and selection intensity) and selection accuracy of sire and dames was significant. The annual genetic gain in high selection intensity, population size of 2000 and less number of herd (5 herds) was 8.5, 93.2 and 38 percent higher than low selection intensity, population size of 500 and more number of herd (20 herds). Despite having less total genetic gain (11 percent) in Minimum co-ancestry mating, the annual inbreeding rate in this mating method was 18 percent lower than random mating. The results of this study showed that less number of herd, large population size and high selection intensity considered in breeding plans of Sistani cattle and minimum co-ancestry mating used for control of population inbreeding.

Keywords: number of herds, population size, random mating, simulation, sistani cattle.



Journal of
Animal Production

(College of Abouraihan – University of Tehran)

Vol. 17 ■ No. 2 ■ Autumn 2015-Winter 2016

Estimation of genetic parameters economic traits Fars native hens using Bayesian statistical approach

Fateme Jafari^{1}, Mohammad-Taghi Beige Nasiri¹, Jamal Fayazi¹ and Mohammad- Ali Loghavi²*

1. M.Sc. Student, Professor and Associate Professor, Department of Animal Science, Faculty of Animal Science and Food Industries, Agriculture and Natural Resources University of Ramin, Ramin, Khuzestan, Iran
2. M.Sc. Animal Affairs Section, Jihad –E-Agriculture of Fars Province, Shiraz, Iran

Received: January 2, 2015

Accepted: April 22, 2015

Abstract

Genetic parameters direct and maternal in Fars native flows using the Bayesian statistical approach, was estimation with consider body weight at a day of age (BW_1), body weight at eight weeks of age (BW_8), body weight at 12 weeks of age (BW_{12}), age at sexual maturity (ASM), egg number (EGP) and mean egg weight during 28th, 30th and 32nd week ages (AV283032) Fars native flows. Genetic parameters were estimated by six different animal models and MTGSAM software. The best model was determined using the Akaike information criterion for each trait. The direct heritability (h^2) estimates basis best model BW_1 , BW_8 , BW_{12} , ASM, EGP and AV283032 0.36, 0.33, 0.30, 0.48, 0.26 and 0.25, respectively. Maternal effects were significant for ASM, EGP and AV283032 traits studied and estimates of maternal environmental variance as a proportion of phenotypic variance (c^2) varied from 0.01 (EGP and AV283032) to 0.39 (BW_1). Results present research showed that Bayesian approach by considering all factors more complicated models was selected as a model.

Keywords: Akaike Criterion, Bayesian statistical method, direct heritability, effects maternal, MTGSAM software.



Journal of
Animal Production

(College of Abouraihan – University of Tehran)

Vol. 17 ■ No. 2 ■ Autumn 2015-Winter2016

Genetic evaluation of Iranian first lactation Holstein cows based upon crude and energy-corrected test day milk records

*Mahshid Mohammadpanah**, *Homayoun Farhangfar* and *Moslem Bashtani*

M.Sc., Professor and Associate Professor, Department of Animal Science, Faculty of Agriculture, University of Birjand, Birjand, Iran

Received: September 30, 2014

Accepted: May 18, 2015

Abstract

Correlation between breeding value of crude milk (CM) and energy-corrected milk (ECM) was studied based on a total of 774,013 test day records belongs to 88,456 first-parity Holsteins dairy cattle calving during 1997-2009 in 165 herds (from six provinces). Genetic analysis of the traits was carried out by a fixed regression test day model. In the model, effects of herd, calving year, production month, production age, type of cow genotype (grade or pure Holstein), sperm type, polynomial function, as well as additive genetic and permanent environmental random effects of the cows were included. Mean breeding values as the genetic evaluation is undertaken based on two traits were statistically significant ($P < 0.0001$). Correlation between breeding value of CM and ECM was the highest (0.92) when all the cows were selected based upon breeding value for ECM and was the lowest (0.27) as 10 top cows were selected based upon breeding value for ECM. It could be therefore concluded that in the case of using ECM instead of CM records, change in the ranking of the elite cows is appreciable.

Keywords: breeding value, energy-corrected milk, genetic evaluation, Holstein cow, test day model.



Journal of
Animal Production

(College of Abouraihan – University of Tehran)

Vol. 17 ■ No. 2 ■ Autumn 2015-Winter2016

Efficiency of bacteriophage in biocontrol of enterococcal colonization of quails

Jalil Noori Raygani¹, Mohammad Amir Karimi Torshizi^{1*}, Shaban Rahimi¹ and Omid Madadgar²

1. Ph.D. Candidate, Assistant Professor and Professor, Department of Poultry Science, Faculty of Agriculture, Tarbiat Modares University, Tehran, Iran
2. Associate Professor, Department of Virology, Faculty of Veterinary, Tehran University, Tehran, Iran

Received: November 15, 2014

Accepted: April 26, 2015

Abstract

Three experiments were carried out for isolation of bacteriophage against growth reducing *Enterococcus faecalis* and evaluation of its efficacy to control *Enterococci* colonization in intestine of Japanese quails. In experiment one, 60 *Enterococci* spp were isolated from gastrointestinal contents of adult quails, which among them seven isolates were selected based on preliminary tests. In experiment two, effect of oral challenge by the seven selected isolates along with *Enterococcus faecalis* ATCC51299- as positive control on growth performance of growing quails was evaluated. In experiment three, lytic bacteriophage was screened against *Enterococcus faecalis* using quails excreta and poultry house swage as a sources of phage. Finally, efficiency of bacteriophage therapy (10^4 pfu/mL) in biocontrol of enterococcal colonization of intestine was evaluated in quails orally challenged by *Enterococcus faecalis* (10^7 cfu/mL). Among seven isolates from the first experiment, an isolate which reduced the growth of growing quails and had the minimum mortality in comparison to negative control group ($P < 0.05$) was final selected and identified at the species level using biochemical tests based of carbohydrates fermentation profile as *Enterococcus faecalis*. Oral administration of isolated bacteriophage against *Enterococcus faecalis* was able to reduce the intestinal enterococci colonization to a level comparable to negative control group ($P < 0.05$). In conclusion, isolated bacteriophage against *Enterococcus faecalis* effectively reduced enterococci colonization in intestinal content of quails and in this way, a growth reducing factor in poultry could be biocontrolled.

Keywords: *Enterococcus faecalis*, growth suppressor, Japanese quail, lytic bacteriophage, phage therapy.



Journal of
Animal Production

(College of Abouraihan – University of Tehran)

Vol. 17 ■ No. 2 ■ Autumn 2015-Winter 2016

Effect of fat source and additive type on performance, productive traits and gut morphology of broiler chickens

Daryush Khademi Shurmasti¹, Farid Shariatmadari^{1}, Mohhamad- Amir Karimi-Torshizi¹ and Houshang Lotfollahian²*

1. Ph.D. Candidate, Professor and Assistant Professor, Department of Poultry Science, Faculty of Agriculture, Tarbiat Modares University, Tehran, Iran
2. Assistant Research Professor, Section of Nutrition and Physiology, Animal Research Institute, Karaj, Iran

Received: December 31, 2014

Accepted: April 26, 2015

Abstract

The present study was carried out to evaluate the effects of vegetable fat sources and additives on performance and morphological parameters of the small intestine of Arain broiler chickens. Birds were randomly used in a 2×3 factorial arrangement of dietary treatments included two fat sources (canola or pumpkin seed) and three additives (without additive, 0.1 g/kg probiotic and 0.15 g/kg virginamycin) with four pen replicates and 20 birds per each. The growth performance and productive traits, with using of neither additives nor fat sources or fat sources × additives were unaffected. However, probiotic was significantly decreased crypt depth and increased villi height to crypt depth ratio in jejunum and ileum ($P<0.01$). Likewise, the highest of villi height and villi height to crypt depth ratio in jejunum and ileum especially was obtained with combination of pumpkin seed oil and probiotic ($P<0.05$). Crypt depth, villi thickness and surface area was higher in duodenum of broilers were fed with pumpkin seed oil ($P<0.05$). Thus, probiotic bacto-cell can be used in diets contain linoleic-oleic (pumpkin seed oil) and linolenic (canola oil) fat groups without negative effect on performance and productive traits.

Keywords: antibiotic, broiler, intestine morphology, probiotic, vegetable fat.



Journal of
Animal Production

(College of Abouraihan – University of Tehran)

Vol. 17 ■ No. 2 ■ Autumn 2015-Winter2016

Effect of vitamin E and C, and different source of oil on performance and serum metabolites of broilers

Maziar Mohiti-Asli and Moein Ghanaatparast-Rashti*

1. Assistant Professor and Ph.D. Student, Department of Animal Science, Faculty of Agriculture, University of Guilan, Rasht, Iran

Received: January 26, 2015

Accepted: June 12, 2015

Abstract

An experiment was conducted to determine of the effects of vitamin E and C supplementation in diet based on different source of oils on performance and serum parameters of broilers. A total of 320 broiler chicks (Strain Ross 308) used in a 2×2×2 factorial arrangement in the form of completely randomized design with eight treatments, four replicates and 10 chicks in each replicate. Experimental factors included: two different oil sources (soybean and canola), two levels of vitamin E (zero and 200 mg/kg), and two levels of vitamin C (0 and 1000 mg/kg). Oil sources and vitamin E and C had no effect on performance of broilers. Supplementation of vitamin E or C increased serum total cholesterol and HDL (P<0.05). Source of oil had no significant effect on glucose and total serum cholesterol. Broilers fed diet containing canola oil had higher HDL and lower serum malondialdehyde than those fed diets with soybean oil (P<0.01). Supplementation of vitamin C to the diets containing canola oil decreased serum triglyceride compared with diets include soybean oil and vitamin C (P<0.05). Supplementation of vitamin E decreased serum malondialdehyde and increased activity of glutathione peroxidase (P<0.05). Results of this study indicate that dietary supplementation of canola oil, vitamin C or E to broiler diet increased serum HDL and vitamin E decreased oxidation of serum lipids by improving antioxidant system.

Keywords: broilers, canola oil, vitamin E, vitamin C, serum parameters, soybean oil.



Journal of
Animal Production

(College of Abouraihan – University of Tehran)

Vol. 17 ■ No. 2 ■ Autumn 2015-Winter2016

Effect of ethanolic extract of propolis, rosemary and earthworm meal on performance of growing quails

Seyed Naser Khaleghi Miran¹, Mohammad- Amir Karimi Torshizi^{1}, Shaban Rahimi¹,
Mohammad- Reza Bassami² and Sakineh Babaei¹*

1. Ph.D. Candidate, Assistant Professor, Professor and Ph.D. Candidate, Department of Poultry Science, Faculty of Agriculture, Tarbiat Modares University, Tehran, Iran
2. Assistant Professor, Department of Clinical Science, Faculty of Veterinary Medicine, Ferdowsi University, Mashhad, Iran

Received: Jan 20, 2012

Accepted: March 6, 2015

Abstract

The effect of ethanolic extract of Iranian green propolis, rosemary and earthworm meal to determine on performance, immune system and blood metabolites of Japanese quail, using 160 mixed-sex quail chicks in a completely randomized design by four treatments (including ethanolic extract of propolis 0.1 percent, rosemary leaves meal 0.5 percent, earthworm meal 0.5 percent and control) and four replicates of 10 birds in each replication for 42 days. Earthworm meal improved the performance ($P<0.05$). The treatments had no significant effect on the antibody production against sheep red blood cells. The highest antibody titers against Avian Influenza and Newcastle disease were related to rosemary and propolis, respectively ($P<0.05$). Rosemary supplemented group showed a better response to cell mediated immunity ($P<0.05$). Addition of propolis and rosemary in diet led to improvement in blood metabolites and earthworm meal decreased blood serum triglycerides, cholesterol and low density lipoproteins compared to the control treatment ($P<0.05$). The results showed that propolis and rosemary enhanced immunity. Furthermore, they were reduced serum glucose and lipids. Although earthworm meal improved performance but it was less effective in improving the immune system and blood metabolites.

Keywords: antioxidant properties, cell mediated immunity, humoral immunity, serum glucose, serum lipids.



Journal of
Animal Production

(College of Abouraihan – University of Tehran)

Vol. 17 ■ No. 2 ■ Autumn 2015-Winter2016

Effect of calcium gluconate injection and post hatch fasting on immune response, mortality and performance in broiler chicks up to day 28 of age

Zeinab Pourazadi, Heshmatollah Khosravinia and Hassan Nourozian*

1. M.Sc., Associate Professor and Assistant professor, Department of Animal Science, Faculty of Agriculture, Lorestan University, Khorramabad, Iran

Received: October 15, 2014

Accepted: April 26, 2015

Abstract

Effects of post-hatch fasting (PHF) and subcutaneous injection of Ca-gluconate (Ca-g) on productive performance, immune response and mortality of broiler chicks were investigated using 640 one-day-old Ross 308 chicks in a 5×2 factorial experiment with five PHF levels (zero, 12, 24, 36 and 48 h) and two Ca-g injection levels (zero and 0.7 ml) in a completely randomized block design in four replicate pens of 16 birds each up to day 28 of age. The extended PHF up to 36 h significantly decreased body weight and percentage of monocytes and increased mortality of the chicks. Injection of Ca-g increased mortality of the birds by six-fold compared with the control birds ($P<0.05$). The Ca-g injected birds showed greater antibody titer against Newcastle virus at day 15 of age. The mortality rate of the chicks was significantly affected by PHF×Ca-g interaction and the Ca-g injected birds showed greater mortality percent during all PHF periods. It was concluded that PHF greater than 24 h has adverse effect on productive performance and mortality in broiler chicks at day 28 of age. Administration of Ca-g into the neonate fasted chicks as a source of Ca, glucose and water increased mortality but maintained the yolk immunoglobulins and improved early immune response through day 15 of age.

Keywords: Blood calcium, Broiler chickens, Calcium gluconate, Fasting, Hatch, Immune response



Journal of
Animal Production

(College of Abouraihan – University of Tehran)

Vol. 17 ■ No. 2 ■ Autumn 2015-Winter 2016

Effect of dried Purslane (*Portulaca oleracea* L.) powder in broilers diet on the performance, immune response and some of blood factors

Hassan Safari*, Ardeshir Mohit and Maziar Mohiti Asli

1. MS.C. and Assistant Professors, Department of Animal Science, College of Agriculture, Guilan University, Iran

Received: December 25, 2014

Accepted: April 26, 2015

Abstract

The effect of different levels of dried *purslane* powder (DPP) in broiler diets on performance, immune response and some of blood factors was studied with 160 one day old chicken Ross 308 in a completely randomized design with four treatments (diets included with levels zero (control), 2.5, 5 and 7.5 percent DPP), four replicates and 10 chicks in each replication. At 22-42 and 1-42 days different level of DPP resulted in a significant increase in the daily body weight gain and daily feed intake. Birds that were fed with five and 7.5 percent of DPP have a better feed conversion ratio compare with the control group ($P<0.05$). The minimum content of blood cholesterol and triglyceride was observed in birds that were fed with five and 7.5 percent DDP, respectively. DPP did not affect cellular immune response to PHA-P and antibody response to Newcastle vaccine. The total anti-SRBC titer, IgG and IgM in birds were fed with diet containing five percent DDP was significantly higher than compare with the control group on day 35 ($P<0.05$). The results of this experiment show that adding five percent DPP in broiler diet led to improve performance and also reduced in cholesterol and triglyceride content and improve the humoral immune.

Keywords: blood factors, broiler chickens, immune response, performance, *Portulaca oleracea* L.



Journal of
Animal Production

(College of Abouraihan – University of Tehran)

Vol. 17 ■ No. 2 ■ Autumn 2015-Winter2016

Investigation of performance and immune response of broiler chickens fed diet containing butyric acid and L-carnitine supplement

Zahra Norreh, Ali Khatibjoo, Farshid Fattahnia and Mohammad Akbari-Gharaei*

1. M.Sc. Student and Assistant Professors, Department of Animal Science, Faculty of Agriculture, University of Ilam, Iran

Received: December 25, 2014

Accepted: April 26, 2015

Abstract

Effect of L-carnitine and butyric acid on the performance and immune responses of 192 broiler chickens (Ross 308) was investigated with three levels of L-carnitine (zero, 125 and 250 mg/kg) and two levels of butyric acid (2 g/kg) in a 2×3 factorial arrangement based on randomized complete block design with 6 dietary treatments, four replicates and eight birds per each. Broilers fed basal diet plus feed additives (L-carnitine and butyric acid) did not have significant differences on feed intake, body weight gain and feed conversion ratio when compared to control group. Broilers fed diets containing additives had higher blood lymphocyte count than control diet fed birds ($P<0.05$). Primary IgG titer (31d) against SRBC in broilers fed diet containing 125 mg/kg L-carnitine was higher than that of the control birds ($P<0.05$). Skin thickness in response to PHA in broilers fed diet containing 250 mg/kg L-carnitine alone and 125 and 250 mg/kg L-carnitine in combination with butyric acid was lower than that of control group ($P<0.05$). It was concluded that addition of 125 mg/kg L-carnitine and two g/kg butyric acid did not influence broiler chicken performance while improved their immune response.

Keywords: butyric acid, broiler chicken, immunity, L-carnitine, performance.



Journal of
Animal Production

(College of Abouraihan – University of Tehran)

Vol. 17 ■ No. 2 ■ Autumn 2015-Winter 2016

Effect of Lemon balm (*Melissa officinalis*) aqueous extract on immune response and performance of broilers

Faezeh Abdinezhad and Mehrdad Mohammadi *

1. Former Graduate Student and Associated Professor, Department of Animal Science, Faculty of Agricultural Sciences, University of Guilan, Iran

Received: February 2, 2015

Accepted: April 26, 2015

Abstract

Effect of adding *Melissa officinalis* aqueous extract was studied on immune response and performance in 200 Ross 308 broiler chicks in a completely randomized design with five treatments and four replicates and 10 observations per replicate. The amounts of 0 (control), 0.5, 1, 1.5 and 2 ml/L Lemon balm extract were added in drinking water for 42 days. Humoral immunity was evaluated by injection of 0.1 ml sheep red blood cell (SRBC) 25 percent on days eight and 22 of age and measurement of serum antibody levels produced in response to SRBC on days 21, 28, 35 and 42. Cellular immunity was assessed by injection of phytohemagglutinin intradermally on day 16. The consumption of Lemon balm extract had no effect on daily feed intake and daily body weight gain ($P>0.05$). The birds that received 1.5 and 2 ml Lemon balm extract in drinking water had lower feed conversion ratio in grower and whole period ($P<0.05$). The birds that received Lemon balm aqueous extract in drinking water had higher total Anti-SRBC titer than control birds on days 28, 35 and 42 ($P<0.05$). IgG titer of birds that received Lemon balm extract was higher than control group on day 28 ($P<0.05$). IgM titer of birds that received 1, 1.5 and 2 ml of Lemon balm extract was higher on days 28 and 35 ($P<0.05$). It is concluded that inclusion of 1.5 ml Lemon balm extract in drinking water decreased feed conversion ratio and improved humoral immunity in broilers.

Keywords: broilers, immune responses, lamiaceae, lemon balm, performance.



Journal of
Animal Production

(College of Abouraihan – University of Tehran)

Vol. 17 ■ No. 2 ■ Autumn 2015-Winter2016

Effect of different levels of probiotic (Clostat) on performance and immunity of heat stressed broilers in finisher phase

Mahdiyeh Soltani, Mozghan Mazhari and Omidali Esmailipour*

1. M.Sc. Student and Assistant Professors, Department of Animal Science, Faculty of Agriculture, University of Jiroft, Jiroft, Iran

Received: December 30, 2014

Accepted: May 27, 2015

Abstract

Effect of probiotic (Clostat) levels on the performance and immune response of heat stressed broilers, was evaluated in a completely randomized design on 144 day-old male Ross broiler chicks with four treatments and four replicates (nine birds each). Experimental diets were consisted in four levels of probiotic (0, 0.05, 0.1 and 0.2). Birds were raised under normal condition till 25 days of age and then were exposed to heat stress ($34\pm 2^{\circ}\text{C}$ for eight hours/day) till the end of trial. The results showed that the effect of probiotic on feed intake was not significant, while birds receiving 0.05 and 0.1 percent probiotic had more body weight gain ($P<0.05$) compared with control birds. Feed conversion ratio (FCR) was better with 0.1 percent probiotic. Increasing probiotic levels, increased relative weight of carcass, breast meat and liver ($P<0.05$). Blood cholesterol concentration was decreased by probiotic levels ($P<0.01$). Heterophil and heterophil to lymphocyte ratio was decreased and glutathione peroxidase increased by probiotic addition. It is concluded that dietary supplementation of 0.1 percent probiotic may improve broiler growth performance and immunity under heat stress condition.

Keywords: glutathione peroxidase, heat stress, heterophil, lymphocyte, probiotic.



Journal of
Animal Production

(College of Abouraihan – University of Tehran)

Vol. 17 ■ No. 2 ■ Autumn 2015-Winter 2016

Effect of *Hibiscus sabdariffa* on performance of broilers fed aflatoxin contaminated diet

Farhad Mohammadi¹, Farzad Bagherzadeh Kasmani^{1*}, Kamal Shojaian¹, Mehran Mehri¹ and Mohammad Amir Karimi Torshizi²

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

Received: February 13, 2015

Accepted: June 11, 2015

Abstract

Effect of adding *Hibiscus sabdariffa* (HS) in diet on performance and immune response of broilers was examined during aflatoxicosis using a total of 192 day-old Ross 308 male chicks in a completely randomized design with four treatments, four replicates and 12 chicks per each replicate. Treatments were include: 1. negative control (without additives), 2. positive control (2.5 mg aflatoxin B₁/kg), 3. diet containing *Hibiscus sabdariffa* (10 g HS/kg) and 4. diet contaminated with aflatoxin and containing *Hibiscus sabdariffa* (2.5 mg AFB₁/kg + 10 g HS/kg). Effect of treatments on feed intake was not significant. Weight gain of chicks in positive control treatment was lower than those birds in other treatments (P<0.001). These birds had higher feed conversion ratio (P<0.001). Antibody titer against Newcastle disease virus and sheep red blood cell in birds fed positive control and containing *Hibiscus sabdariffa* diets were lower and higher than those birds in negative control group, respectively (P<0.001). The least skin thickness after challenging with dinitrochlorobenzene (DNCB) was observed in birds fed positive control diet (P<0.001). Relative weight of bursa of Fabricius in chicks fed positive control and *Hibiscus sabdariffa* diets was lower and higher than that of negative control group, respectively (P<0.001). Based on results of this experiment, supplementation of *Hibiscus sabdariffa* to aflatoxin contaminated diets could ameliorate the effects of toxin on growth performance and immunity response of broilers.

Keywords: aflatoxicosis, broiler, *Hibiscus sabdariffa*, immunity, performance.



Journal of
Animal Production

(College of Abouraihan – University of Tehran)

Vol. 17 ■ No. 2 ■ Autumn 2015-Winter2016

Effect of honey, royal jelly and bee pollen on performance, immune system and blood parameters in Japanese quail

Sakineh Babaei¹, Shaban Rahimi^{1}, Mohammad-Amir Karimi Torshizi¹, Gholam- Hossein Tahmasebi¹ and Seyed Naser Khaleghi Miran²*

1. Ph.D. Candidate, Professor and Assistant Professor, Department of Poultry Science, Faculty of Agricultural, Tarbiat Modares University, Tehran, Iran
2. Professor, Section of Honeybee Research, Animal Science Research Institute, Karaj, Iran

Received: January 22, 2015

Accepted: March 13, 2015

Abstract

The effect of honey, royal jelly and bee pollen on performance, immune system and blood factors of Japanese quail, using 160 quail chicks in a completely randomized design by four treatments [control (without additives), pollen powder 1 g/kg, royal jelly 125 ppm/L, honey 22 g/L) and four replicates of 10 chicks in each replication for 42 days. The experimental groups had no significant effect on feed intake and mortality rate ($P>0.05$) in whole period. Birds that received honey in drinking water, the best daily body weight gain and feed conversion ratio had compared to other groups. The experimental groups had no significant effect on the antibody production against sheep red blood cells. The highest antibody titers against Newcastle disease and Avian Influenza viruses were related to honey treatment ($P<0.05$). Addition of pollen to diet, royal jelly and honey in drinking water were significantly affected spleen weight compared to control group ($P<0.01$). Honey and pollen showed a better response to cell mediated immunity ($P<0.01$). The use of honey bee products improved blood factors ($P<0.01$). The results showed that the honey and royal jelly enhanced immunity and performance of the Japanese quails. Furthermore, they were reduced serum glucose and lipids in these birds. Although bee pollen improved blood factors but it was less effective in improving the immune system and performance.

Keywords: blood parameters, cell mediated immunity, honey bee, humoral immunity, Japanese quail.



Journal of
Animal Production

(College of Abouraihan – University of Tehran)

Vol. 17 ■ No. 2 ■ Autumn 2015-Winter 2016

Effects of dietary inclusion of medicinal plants' by-product mixture on performance of laying hens receiving different omega-6 to omega-3 ratios

Syedeh Asma Mousavi, Seyed Amir-Hossein Mahdavi*, Ahmad Riasi and Ali Sadeghi-Sefidmazgi

1. M.Sc., Assistant Professor, Associate Professor and Assistant Professor, Department of Animal Sciences, College of Agriculture, Isfahan University of Technology, Isfahan, Iran

Received: February 9, 2015

Accepted: June 20, 2015

Abstract

The effects of dietary inclusion of medicinal plants' by-product mixture on performance, the relative internal organ weight, ileal microbial counts, and small intestinal and liver morphologic alterations in laying hens receiving different omega-6 to omega-3 ratios as a 2×3 factorial arrangements with three levels of plants' by-product (zero, 2.5 and five percent) and two omega-6 to omega-3 ratios based on completely randomized design containing six treatments with four replicates of five birds each. Feeding low dietary omega-6 to omega-3 ratio to hens led to a significant increase in the relative spleen weight, the number and diameter of lamina propria lymphoid follicles and middle egg production percentage ($P=0.05$), and a reduction in the relative liver weight and hepatic fat percentage ($P<0.05$). Furthermore, dietary inclusion of plants' by-product mixture improved villi height, the numbers and diameter of lamina propria lymphoid follicles, the number of goblet cells ($P<0.05$) as well as feed conversion ratio ($P=0.08$). Hepatic malondialdehyde concentration and ileal *Escherichia coli* population was decreased ($P<0.01$) in hens given plants' by-product mixture. Therefore, our findings indicated that low dietary omega-6 to omega-3 ratio could improve egg production slightly, and administration of five percent of medicinal plants' by-product mixture as a result of synergistic effect expressions could improve intestinal and hepatic health indices as well as feed conversion ratio in laying hens.

Keywords: histological alterations, laying hens, medicinal plants' by-product mixture, omega-6 to omega-3 ratio, performance.



Journal of
Animal Production

(College of Abouraihan – University of Tehran)

Vol. 17 ■ No. 2 ■ Autumn 2015-Winter2016

**Yield, composition and digestibility of Jerusalem artichoke
(*Helianthus tuberosus*) at different harvesting stages**

*Nader Papi **, *Farokh Kafilzadeh* and *Hasan Fazaeli*

1. Ph.D. Candidate and Professors, Department of Animal Science, Faculty of Agriculture, Razi University, Kermanshah, Iran

Received: January 21, 2015

Accepted: March 17, 2015

Abstract

This research was assigned to study the top crop yield potential and nutritive value of Jerusalem artichoke (*Helianthus tuberosus*), using a completely randomized designed with three treatments and four replications. The forage was cut at three growing stages where plant high, fresh and dry forage yield and leave/steam ratio were recorded. First and second cut were made when the plant heights were 100-150 and 150-200 cm, respectively. Forage from the third cut was at the early bloom stage (200-250cm). Then the cuts were chopped and sampled and nutrient contents and *in vitro* digestibility of the samples were determined. The amount of fresh and dry forage yield were 45.20 and 15.95 (ton/h) in first cut, and 64 and 29.85 (ton/h) in the last cut (flowering stage), respectively. Yield of second cut was significantly higher ($P<0.05$) than the first cut. The crude protein content was the highest (13.42 percent) in the first but the lowest (9.21) in the last cut ($P<0.05$). The non-fiber carbohydrates contents increased by enhancement of the growing stage ($P<0.05$). The amount of ash was the highest in the first but the lowest in the last cut ($P<0.05$). *In vitro* DMD and OMD were not affected by the growing stage. Results obtained from gas test showed that the cumulative gas yield was the highest at the third cut but the lowest at the first cut ($P<0.05$). In conclusion, Jerusalem artichoke could be considered as a good potential forage source.

Keywords: digestibility, gas production, *helianthus tuberosus*, non-fibrous carbohydrates, nutrients.



Journal of
Animal Production

(College of Abouraihan – University of Tehran)

Vol. 17 ■ No. 2 ■ Autumn 2015-Winter 2016

Effect of feeding frequency of protein sources on fiber digestibility, feeding behaviors and rumen metabolites of Holstein cows

Moustafa Hajilou^{1*}, Hamid Reza Mirzaei Alamouti¹, Mehdi Ghanjkanlou² and Hamid Amanlou¹

1. Ph.D. Candidate, Assistant Professor and Professor, Department of Animal Science, Faculty of Agriculture, University of Zanjan, Zanjan, Iran
2. Assistant Professor, Department of Animal Science, Faculty of Agricultural Sciences and Engineering, College of Agriculture and Natural Resources, University of Tehran, Karaj, Iran

Received: February 8, 2015

Accepted: May 30, 2015

Abstract

Four ruminally-cannulated Holstein cows were used in a 4 × 4 Latin square changeover design within periods of 21 days to evaluate effects of feeding frequency of different sources of rumen degradable nitrogen on total tract digestibility of nutrients, feeding behaviors, rumen and blood metabolites of Holstein cows. Treatments were: 1) control diet which was as total mixed ration (TMR) offered once daily in the morning (08:00), 2) control diet in which a part of its soybean was offered at 19:00, 3) control diet in which a part of its urea was offered at 19:00 and 4) control diet in which a part of its fish meal was offered at 19:00. Rumination time increased in cows fed twice daily with protein sources ($P < 0.05$). Total tract digestibility of dry matter and organic matter were higher in cows received urea at the evening time. Total tract digestibility of neutral detergent fiber increased with feeding all sources of protein at the evening time ($P < 0.05$). Molar proportion of volatile fatty acids, rumen pH and rumen ammonia concentration were not affected by feeding time of protein sources. The results indicated that increasing delivery of rumen degradable nitrogen sources improved dry matter and fiber digestibility and chewing activity of non-lactating Holstein dairy cows.

Keywords: corn silage, fish meal, holstein cows, soybean meal, urea.



Journal of
Animal Production

(College of Abouraihan – University of Tehran)

Vol. 17 ■ No. 2 ■ Autumn 2015-Winter 2016

The effect of different levels of silage leaf and stem of banana tree with waste date palm on feed intake, microbial protein synthesis and blood parameters of sheep

Monavareh Ghoudosi, Omid Dayani , Amin Khezri and Mohammad- Mahdi Sharifi Hosseini*

1. M.Sc. Student and Associate Professor, Department of Animal Science, Faculty of Agriculture, Shahid Bahonar University of Kerman, Iran

Received: February 14, 2015

Accepted: June 28, 2015

Abstract

The effect of feeding silage of leaf and stem of banana tree with waste date palm on feed intake, microbial protein synthesis and blood parameters using four adult rams in a change-over design with four 21-days period were examined. Eighty five kg leaf and stem of banana tree with 15 kg of waste date palm were mixed together and ensiled for 45 days. Chemical composition and sensory evaluation of silage of leaf and stem of banana tree with waste date palm was evaluated and used in experimental diets as zero, seven, 14 and 21 percent of DM. According to sensory evaluations, silage with a score of 20 had a very good rating. Nitrogen retention in sheep fed 21 percent silage was lower than the control group ($P<0.05$). Dry matter digestibility of experimental diets containing 14 and 21 percent silage was lower than diets containing zero and seven percent silage ($P<0.05$). The mean excretion of allantoin, uric acid and total purine derivatives in the urine of sheep were increased linearly ($P<0.05$) with increasing the silage in the experimental diets. Increasing of nitrogen and microbial protein synthesis in sheep fed diet containing 21 percent silage was more than sheep fed diet without silage ($P<0.05$). Increasing of the silage level in diet, was increased triglyceride concentration by linearly ($P<0.05$). According to the results, using of 21 percent silage of leaf and stem of banana tree with waste date palm in sheep diet without change in dry matter intake, increase microbial protein synthesis.

Keywords: blood parameters, dry matter intake, microbial protein, silage of leaf and stem of banana tree, waste date palm.



Journal of
Animal Production

(College of Abouraihan – University of Tehran)

Vol. 17 ■ No. 2 ■ Autumn 2015-Winter 2016

Effect of zinc nano-complex on bull semen quality after freeze-thawing process

Raana Jahanbin¹, Parisa Yazdanshenas¹, Mehdi Amin Afshar^{1}, Abdollah Mohammadi Sangcheshmeh², Hamid Varnaseri³, Mohammad Chamani¹, Mohammad-Hasan Nazaran⁴ and Mohammad- Reza Bakhtiyarizadeh²*

1. M.Sc. Students, Assistant Professor and Associate Professor., Departments of Animal Science, Faculty of Agriculture and Natural Resources, Science and Research Branch, Islamic Azad University, Tehran, Iran
2. Assistant Professor, Departments of Animal Science, Abourayhan Campus, University of Tehran, Pakdasht, Iran
3. Assistant Professor, Nahadehaye Dami Jahed Co. Tehran, Iran
4. Ehrare Hargh Company, Tehran, Iran

Received: November 4, 2014

Accepted: March 5, 2015

Abstract

The effect of zinc Nano-particles (Zn- nano- complex) on bull sperm quality after freeze-thawing process studied. Ejaculates collected from four Holstein bulls twice a week. On the day of semen collection, four ejaculates were pooled and diluted with Bioxcell extender containing 0, 10^{-6} , 10^{-5} , 10^{-4} , 10^{-3} , 10^{-2} molar of zinc Nano-complex and frozen. After thawing, sperm motility and motion parameters, plasma membrane integrity, abnormal morphology, plasma membrane functionality and mitochondrial activity were determined. The proportion of the total and progressive motile sperm, the plasma membrane integrity and proportion of the spermatozoa with abnormal morphology was not different among groups. Zinc Nano-complex groups represented a higher plasma membrane functionality than that of control group. Moreover, our flowcytometric data suggested that spermatozoa in the groups of zinc Nano-complex possessed higher mitochondrial activity as compared with the control group. Mitochondrial activity in 10^{-2} was higher than the 10^{-6} group. In conclusion, supplementation of zn Nano-complex, can improve the plasma membrane functionality and mitochondrial activity of bull spermatozoa in a dose dependent manner without any deleterious effect on motility parameters.

Keywords: anti-oxidant, mitochondrial activity, semen quality, sperm, zinc nano-particles.



Journal of
Animal Production

(College of Abouraihan – University of Tehran)

Vol. 17 ■ No. 2 ■ Autumn 2015-Winter 2016

Applying STO as feeder layer for Rooster Spermatogonial Stem cell culture

Rasoul Karimi¹, Malek Shakeri^{1*}, Mahdi Zhandi¹, Hossein Moravej¹, Haniyeh Banikamal¹, Abdollah Mohammadi-Sangcheshmeh² and Mahdi Khodaei-Motlagh³

1. M.Sc. Student, Assistant Professors, Associate Professor and M.Sc. Student, Department of Animal Science, Faculty of Agricultural Science & Engineering, College of Agriculture and Natural Resources, University of Tehran, Karaj, Iran
2. Assistant Professor, Department of Animal and Poultry Science, College of Abouraihan, University of Tehran, Pakdasht, Tehran, Iran
3. Assistant Professor, Department of Animal Science, Faculty of Agriculture and Natural Resources, Arak University, Arak, Iran

Received: February 2, 2015

Accepted: June 29, 2015

Abstract

The objective of this study was to evaluate the effect of the STO feeder layer on prepubertal *Rhode Island Red* rooster SSCs culture and proliferation *in vitro*. Testis cells from 30 prepubertal Rhode Island Red chicken (4-8 weeks of age), were individually separated and cultivated in the presence of bFGF and LIF growth factors on four well plates with two treatments and three replicats and five observations per each. SSCs colonies appeared on the 5th day of culture. The number of SSCs colonies, cells/colony and colony area was measured on days 7 and 10 for both treatments. The result of the colony assay on the 7th day revealed significantly higher colony numbers as well as higher cell number/colony and colony area on the STO surface compared to colonies grown on surfaces without a feeder layer ($P \leq 0.05$). In contrast, the results of the colony assay on day 10 had declined for both treatments, as compared to day 7. Also, the C-KIT gene was not expressed which is an indication that colonies might be composed of SSCs. In conclusion, these results indicate that the use of the STO feeder layer influences the SSCs proliferation and maintenance of the prepubertal roosters in short-term culture.

Keywords: avian spermatogonial stem cells, cell colony, cell feeder layer, cell growth factor, chicken short term culture.



Journal of
Animal Production

(College of Abouraihan – University of Tehran)

Vol. 17 ■ No. 2 ■ Autumn 2015-Winter 2016

Estimation of heritability and genetic and phenotypic correlation between egg quality and body weight traits in Native Fowls of Fars

Saman Abbasi¹, Mokhtar Ali Abbasi^{2} and Alireza Noshari¹*

1. M.Sc. and Assistant Professor, Department of Animal Science, Faculty of Agriculture, Islamic Azad University of Karaj Branch, Karaj, Iran
2. Associated Professor, Department of Animal Breeding, Animal Science Research Institute, Karaj, Iran

Received: February 22, 2015

Accepted: July 5, 2015

Abstract

A total of 2000 records of egg quality of 746 birds and body weight data from 17th generation of Fars Native Fowl Breeding Station were used to estimate the genetic parameters of egg quality and body weight traits. Six univariate animal models with different random effects were fitted for each trait. A model with direct additive genetic and maternal permanent environmental effects was the most appropriate model for mature weight. For body weight in 12th week, the model with direct additive genetic, maternal genetic and maternal permanent environmental effects was suitable. The model with direct additive genetic and maternal genetic effects was appropriate for albumen diameter, yolk weight and egg weight. For other traits, the simple animal model with direct animal additive genetic effect was the best model. Estimates of heritability were ranged from 0.02 (yolk weight) to 0.23 (albumen index) for internal egg quality and were ranged from 0.01 (egg weight) to 0.43 (egg shell strength) for external egg quality traits. These parameters were estimated 0.03, 0.07 and 0.18 for mature weight, body weights at 8th and 12th weeks, respectively. Genetic correlations between egg quality and body weight traits ranged from -0.79 to 0.80. In conclusion, selection based on the body weights at 8th and 12th weeks increases the egg weight, egg width and egg shape index. Selection for body weight in 12th week would increase the albumen weight and yolk diameters.

Keywords: body weight, egg quality, genetic correlation, heritability, native fowl.



Journal of
Animal Production

(College of Abouraihan – University of Tehran)

Vol. 17 ■ No. 2 ■ Autumn 2015-Winter2016

Effect of dietary inclusion of raw or treated oak acorn (*Quercus brantii* Lindl) on the performance and cecal flora of broiler chickens

Sahere Gharibi, Mohammad Houshmand and Reza Naghiha*

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

Received: March 9, 2015

Accepted: July 11, 2015

Abstract

This study was conducted to investigate the influences of raw or acetic acid-treated oak acorn on the performance and cecal flora of broiler chickens. A total of 340 one-day-old male and female Cobb 500 broiler chicks were used in a completely randomized design consisting of five treatments with four replicates and 17 chicks each. First group was fed with a corn-based diet (without oak acorn) as control, while the chicks of groups 2, 3, 4 and 5 were fed with diets containing 20 or 25 percent raw or treated oak acorn, respectively. The results indicated that treatment with acetic acid significantly reduced content of the all phenol components (total phenol, total tannin and condensed tannins). Dietary inclusion of raw oak acorn at the levels of 20 and 25 percent, significantly reduced broilers body weight gain ($P < 0.05$). However, this reduction was not observed for treated groups. Feeding with raw or treated oak acorn resulted in higher feed conversion ratio compared with the control group ($P < 0.05$). *E. coli* and *lactic acid* bacteria counts were not affected by dietary treatments at 21 or 42 day of the study. In conclusion, dietary inclusion of 20 and 25 percent raw or treated oak acorn resulted in a significant reduction in broilers performance and hence, it is not recommended.

Keywords: acetic acid, broiler, oak acorn, tannin, treatment.