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The Effect of Different Severities of Diet Dilution and Using a Supplemental Enzyme on Performance of Broiler Chickens

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Abstract

In this study the effect of diet dilution in 16-20 d of age and using a multi-enzyme (Endofeed-W) on performance, carcass characteristics and some blood parameters of broiler chickens (Cobb 500, commercial strain) was studied. This experiment was conducted as a factorial arrangement 2×3 in a completely randomized design with 3 replicates and 8 chicks in each replicate. Experimental diets contained 0, 20 and 40 percent rice hulls and 2 levels of enzyme (0, 500 mg/Kg). These diets contained 3000, 2400, 1800 Kcal/Kg metabolizable energy, and 21, 16.8 and 12.6 % crude protein, respectively. In other days of experiment, the chicks were fed in according to Cobb 500 rearing guideline. During feed restriction and whole period of rearing (1-44d), diet diluting up to 20% decreased feed conversion ratio ($P<0.05$). Adding enzyme to experimental diets decreased feed intake and feed conversion ratio in whole period of experiment ($P<0.05$). Chickens fed with treatment 2 (without rice hulls, 0.05% supplemental enzyme) had the lowest feed intake and feed conversion ratio in whole period of the experiment. Results showed that diet diluting up to 20 % during 16-20 d of age, with or without Endofeed-W supplemental enzyme had no adverse effect on broiler chickens performance.

Keywords: Diet diluting, Endofeed-W, Performance, Broiler chicken

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The Effect of Different Levels of Crude Protein and Threonine on Performance and Immune system of Broiler Chickens during Starter and Grower Periods

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Abstract

This experiment was conducted to evaluate the effect of different levels of crude protein and threonine on performance, carcass characteristics and immune system of broiler chickens during starter (7-24) and grower (25-42) periods. A total of 288 male broiler chicks of Ross 308 strain were used in a completely randomized design with factorial arrangement (2×4) with three replicates in each treatment. Experimental diets were included two levels of protein (Ross 308 guideline recommendation and 5% lower than the recommendation) and four levels of threonine (90, 100, 110, 120 of NRC recommendation). At starter period, threonine levels had a significant effect on feed conversion ratio ($P<0.05$), and dietary threonine levels higher than 90 percent of NRC recommendation improved feed efficiency. In addition, the effects of interactions between protein and threonine levels on feed intake were significant. Gastrointestinal tract weight was also affected by dietary protein levels during starter period. During growth period, increasing levels of threonine above 90% of NRC recommendation improved body weight gain and feed conversion ratio. Dietary threonine levels had a significant effect on breast yield percentage/live weight gain at 24 d of age. Also, the effects of interactions between protein and threonine levels on the abdominal fat were significant. In both periods, decreasing the dietary protein levels and increasing dietary threonine levels decreased feed cost per kg of weight gain and increased the profit. Best performance was observed by 110 percent threonine above the NRC recommendation. At 41 d of age, the effect of threonine on antibody response to SRBC injection was significant ($P<0.01$), and increasing levels of threonine higher than 90 percent of NRC recommendation increased the antibody titer in response to SRBC injection. In conclusion, results of current experiment showed that threonine supplementation up to 110 percent of NRC recommendation improved performance, carcass characteristics and immune system of broiler chickens.

Keywords: Crude protein, Threonine, Performance, Carcass characteristics, Immune system

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Comparison of Performance and Leg Bone Characteristics of Broiler Fed Different Levels of Vitamin Premix in Floor and Battery Cage Rearing Systems

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Abstract

Two experiments were carried out in order to comparison of the effect of different levels of vitamin premix in two raising systems of floor and cage on performance and leg bone characteristics of broiler chickens which were fed with adjusted diet base on wheat and barley during 29 to 42 days. The treatments were composed of 0, 33.33, 66.66 and 100 percent of vitamin premix (according to the recommendation of vitamin premix Producer Company) which used from 29 to 42 days. Experiment in floor was carried out by using 288 male broiler chickens (Ross 308) with 4 treatments and 4 replicates in a completely randomized design in floor system. Experiment in cage battery system was carried out by using 80 male broiler chickens with 4 treatments and 4 replicates in raising cage. Feed intake and body weight gain of each replicate were calculated during two weeks of the experiment. During these two weeks, in experiment in floor, two broiler chickens were measured and in experiment in cage battery system one broiler chickens slaughtered and breast, thigh, percentage of abdominal fat and liver were measured. After slaughtered, right leg of each bird was used for determine ash, calcium, phosphorus and strength. The results of the experiment in floor showed that vitamin premix withdrawal at 29 days of age did not impair carcass characteristics and leg bone characteristics during the final rearing period. The results of battery cage system showed that withdrawal of vitamin premix from the diet of experimental birds; were induced negative effect on productive performance, weights of thigh, and breast and leg bone characteristics during 36-42 day of ages. Therefore, it seems that there is the possibility of vitamin premix levels reduction up to the approximate 33% level in finisher period while in the floor system; it is possible to withdraw vitamin supplements in broilers' finisher diets and in this way the costs of poultry industry will reduce.

Keywords: Vitamin premix, Broiler chickens, Rearing systems, Bone characteristics

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Determination of Processing Quality Tests of Full Fat Soybean Extruded at Three Temperatures and Correlation with Growth Performance of Broiler Chickens

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Abstract

Two studies were conducted to evaluate the correlation between growth performance of chicks fed full fat soybean (FFSB) extruded at 145, 155 and ^{o} 165 and laboratory quality tests. In biological study, one hundred and forty four d-old male broiler chicks were divided into 12 groups including 3 treatments with 4 replicates of 12 chicks each and fed three diets containing 15 % FFSB extruded at 145, 155 and 165 ^{o}C from 0 to 21 d of age. Feed intake (FI), weight gain (WG) and feed conversion ratio (FCR) of chicks were not affected with increasing FFSB extrusion temperatures during 0-21 d of age. For evaluation the quality tests, the urea activity index (UA) was obtained as 0.11, 0.09 and 0.05 for FFSB extruded at 145, 155 and 165 °C, respectively. The correlation between UA with WG and FCR of chicks were 88 and 85 percent, respectively. The protein solubility in KOH (PSKOH) of FFSB extruded at 145, 155 and 165 °C, were 80.2, 78.1 and 72.4, respectively. The correlation between PSKOH with WG and FCR of chicks were 81and 88 percent, respectively. The protein dispersibility index (PDI) were 21.5, 20.8 and 16.5 for FFSB extruded at 145, 155 and 165 °C, respectively. The correlation of PDI with WG and FCR of chicks were 92 and 89 percent, respectively. It is concluded that the laboratory quality tests of FFSB were extruded at 145, 155 and 165 °C were in optimum range for broiler nutrition. Also the PDI had higher correlation with growth rate of chickens as compared to UA and PSKOH and could be the best quality index for estimating the growth rate of broiler chickens fed EFFSB.

Keywords: Full fat soybean, Extrusion temperature, Laboratory quality tests, Broiler chicks, Growth performance

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Effect of Sodium Bentonite Addition to Diets Containing Cottonseed Meal on Apparent Digestibility of Nutrients and Profitability of Laying Hens

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Abstract

The objective of this study was to evaluate the effect of cottonseed meal (CSM) treated with sodium bentonite (SB) on laying hen profit and apparent digestibility of nutrients. A 3×3 factorial arrangement in a completely randomized design with 9 dietary treatments of 4 replicates consisting 3 levels of SB (0, 1 and 2%) and 3 levels of CSM (0, 10 and 20%) were tested. Nine mash diets were fed to 288 commercial Hy-Line W-36 hens from 51 weeks of age for 12 weeks. Feeding 20% CSM reduced apparent digestibility of organic matter and egg production and increased feed cost. Inclusion of 10% CSM did not have adverse impacts on nutrients digestibility and hen performance. Interestingly, CSM at the level of 10% increased economic profit and reduced excreta moisture. Egg shell quality was not influenced by SB or CSM. The SB significantly decreased apparent digestibility of dry matter and organic matter; however did not have deleterious effects on productive traits. In overall, diet with 1% SB and 10% CSM resulted in the best performance and the most economic profit of laying hens.

Key words: Hy-line laying hen, Cottonseed meal, Sodium bentonite, Excreta moisture, Profitability

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Comparison of Chemical and Degradability Characteristics of Green Forage and Silage of Sorghums Varieties with Corn Using *In vitro* and Nylon bag Methods

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Abstract

The chemical and fermentative parameters of three fresh forages and silages of sorghum including Sweet, Pegah and Speedfeed varieties were compared with corn using *in vitro* method, also degradability coefficients of forages and silages were determined by *in situ* method. Forages were planted in the same condition and harvested in soft dough stage, then ensilaged in four replicates for each time of 30, 60 and 90 days of preservation in mini silos. Buffering capacity in green Sweet sorghum was lower than corn and Speedfeed, and acid detergent fiber and water soluble carbohydrates respectively were significantly highest and lowest in fresh forage of Speedfeed sorghum. In time of 60 days, percent of acid detergent lignin of corn silage was lower than Sweet and Speedfeed sorghum silages; similarly, residual water soluble carbohydrate was lowest in corn silage. The lactate Concentration in corn and Pegah sorghums was higher than Sweet and Speedfeed silages. In corn and Sweet sorghum silages, Contents of acetic acid and ammonium nitrogen were highest and lowest, respectively. In *nylon bag* experiment, Degradation rate of corn and Pegah sorghum forages were significantly higher than Sweet and Speedfeed sorghums that cause to more effective degradability with passage rate of 0.08 in this forages. Also, the slowly degradation coefficient of corn silage was higher than sorghums silages. In conclusion, Speedfeed sorghum forage is not suitable for making silage in comparison others, and corn silage had more potential of degradability.

Keywords: Sorghum silage, Corn silage, In vitro, Nylon bag method

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Effects of Feeding two Sources of Rumen Protected Methionine on Production Performance and Blood Metabolites of Mid Lactating Holstein Cows

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Abstract

Fifty-seven Holstein lactating cows in mid-lactation period (milk yield: 33±2.1 kg/d, days in milk: 152±27 d) used in a randomized complete block design with three treatments, two block (parity) and 19 replicate (cow) in each treatment. The hypothesis of present study was "is it possible to decrease the diet crude protein (CP), through supplementing rumen-protected methionine (RPM), without decrease in productivity or not?" Diets included: 1) 16% of CP with 20 g/d RPM (Methilock); 2) 16% of CP with 12 g/d RPM (Mepron) 3) 17% of CP, without RPM. Milk yield recorded three subsequent days in each weeks and milk samples taken weekly for milk analysis. Daily dry matter intake was measured and cow's body weight was recorded in first and last days of experiment. There were no significant effects of RPM sources (Methilock or Mepron) on milk production. Through treatments, just Methilock caused significant decrease in milk protein percentage, but the other milk compostions were similar. Through blood metabolites only plasma Beta Hydroxi Butiric Acid (BHBA) and Blood Urea Nitrogen (BUN) concentrations were affected by experiment diets. Cows assigned to treatments 1 and 2, had similar feed consumption efficiency like the control group, in regard to that they fed diet with one percentage less CP. In regard to the present result that made by high protein diets, rumen protected methionine supplements can use in mid lactating diet for decrease CP concentration.

Keywords: Rumen-protected methionine, Holstein cows, Production performance, Crude protein

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The Effect of Processing of Sugarcane Pith with Steam on Gas Production Parameters by Using Isolated Rumen Microbiota

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Abstract

This experiment was conducted to determine the effect of procceesing of sugarcane pith with high pressure steam (210-220C°, at 19 bar, over 3 min, on 70 % moisture) on fermentative activity and gas production parameters and degradation by pure microorganism of rumen. The microbial different groups of rumen were separated by physical and chemical methods and using antibiotics. These microbial groups were including; total microorganism, fungi, bacterial, protozoal, fungi and bacteria, bacteria and protozoa and fungi and protozoa. Gas production parameters after 96 h incubation by these microbial groups were determined by the exponential equation. The processing with steam significantly increased rate and gas production from fermentable fraction of sugarcane pith by all rumen microbial groups. The highest gas production from fermentable fraction (193.25 ml) and rate of gas production (0.09 ml/h) by rumen microorganism was for sugarcane pith processed with steam. The highest gas production was observed by total rumen microorganism and the lowest was for rumen protozoa. Therefore, the result of experiment showed that high pressure steam without detrimental effects can improve digestion and fermentation of sugarcane pith.

Keywords: Sugarcane pith, Steam, Rumen microorganism

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Using of Different Grain Sources with or without Monensin on Fattening Performance of Brown Swiss Male Calves

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Abstract

The effect of barley or triticale and monensin on fattening performance of Brown Swiss calves (with average body weight of 170±30 kg) were studied in a completely randomized design with factorial arrangement of 2×2 and 4 replicates. Experimental treatments were: 1- barley grain without monensin 2- barley grain with monensin 3- triticale grain without monensin and 4- triticale grain with monensin. The amount of monensin in the ration was set to be 30 mg/kg DM. Calves weighing was undertaken monthly and dry matter intake was measured daily. Sampling from rumen fluid was carried out using a stomach tube, and blood sampes were taken at the end of each month. Average daily gain, feed conversion ratio and daily feed intake were not significantly affected by the treatments. Monensin had no significant effect on blood glucose concentration. Ruminal N-NH3, blood urea nitrogen and ruminal pH were not significantly affected by the experimental treatments. As grain sources and monensin application had no effect on fattening performance of the calves. it can therefore concluded that triticale grain might be utilized substituted with barley grain in feed lot diets. This substitutionn can be important from the economical of view in calves feed lot interprise.

Keywords: Monensin, Barley, Triticale, Fattening calve

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Effect of Calcium Borogluconate Injection pre and Immediately Postpartum on Production Performance, Incidence of Metabolic Disorders and Situation of the Uterus After Calving in Cows Fed Anionic Diets

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Abstract

The objective of this study was to determine the effect of calcium borogluconate injection 48 and 24 hours prepartum and immediately after parturition on dry matter intake at day of calving, milk yield, incidence of metabolic disorders and uterine conditions during the first 21 days postpartum in cows fed anionic diets. Thirty six lactating dairy cows were balanced by parity (1, 2, 3+) and allocated to 4 subcutaneous injection treatments of 15.2 gr calcium as borogluconate at different times pre and postpartum than expected calving date . Group 1 consisted of 9 cows receiving no treatment before or after parturition. Group 2 consisted of 9 cows receiving calcium borogluconate 48 h prepartum.Group 3 consisted of 9 cows receiving calcium borogluconate 24 h prepartum. Group 4 consisted of 9 cows receiving 15.2 gr of ca as borogluconate immediately postpartum. Dry matter intake was in treatments 1, 2, 3 and 4 was 10.87, 12.32, 12.63 and 15.03 kg in the first 24 h after calving, respectively And indicated significantly difference among treatments. milk yield in 2, 3 and 4 treatments was significantly greater than group 1 in the first 21 days of lactation (38.7, 38.9, 40.3 vs 36.07 kg/d). Treatment had a significant effect on the subclinical hypocalcemia incidence so incidence risk of subclinical hypocalcemia in 1 treatment was 10 times more likely than 4 treatment. Data regression analysis indicated that 4 treatment had a significant effect on the ketosis incidence. So that the cows no calcium injection 2.43 times more likely to experience ketosis than 4 treatment. But experimental treatments were not significantly effect on the incidence of milk fever, displacement abomasum, retained placenta, metritis and endometritis. In general, calcium injection, especially immediately after parturation increased the dry matter intake in day of calving and reduced metabolic disorders such as hypocalcaemia and ketosis.

Keywords: Borogluconate, Clinical and subclinical hypocalcemia, Pre and postpartum

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Resistance of Microencapsulated Fish Oil in the Rumen and Its Effect on Gas Production and Rumen Degradability

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Abstract

Resistance of microencapsulated fish oil (MFO) in the rumen and its effects on fermentability of nutrients in the rumen was studied in 3 experiments. The key parameter in these studies was the amount of oil released from the microcapsules and their effects on gas production and rumen degradability in comparison with unprotected fish oil (FO). In the first experiment the effect of rumen and abomasum pH on disintegration of MFO and amount of fish oil released was investigated. In the second experiment effects of MFO on *in vitro* gas production and rumen fermentation kinetics was undertaken and in the third experiment *in vitro* Batch culture was used in order to estimate the effect of MFO on rumen degradability. Experimental treatments in the first experiment were 1) simple Microcapsules 2) tannic acid treated Microcapsules and 3) Ca^{2+} treated Microcapsules. In the second experiment or gas production study 2 kinds of basal diet including the forage diet (dry alfalfa) and the complete diet (forage to concentrate with ratio of 60:40) with 8 treatments for each experimental diet: including; 1) the control (without supplement), 2) 4% fish oil, 3) 12% whey protein concentrate and 4% fish oil, 4) 12% whey protein concentrate and 1.2% tannic acid, 5) 12% whey protein concentrate, 4% fish oil and 1.2% tannic acid, 6) 16% simple microcapsules 7) 17.2% tannic acid treated Microcapsules and 8) 17.2% Ca^{2+}treated microcapsules were used. In the third experiment dry forage used as basal diet with 6 experimental treatments including; 1) the control (without supplement), 2) 4% fish oil, 3) 12% whey protein concentrate and 4% fish oil, 4) 16% simple microcapsules 5) 17.2% tannic acid treated microcapsules and 6) 17.2% Ca^{2+} treated microcapsules with 24h incubation time. In the first experiment the amount of oil released of microcapsules in rumen were 74, 7 and 12% and in abomasum were 74, 59 and 67% for simple, tannic acid and Ca^{2+} treated microcapsules respectively. Resistance of tannic acid treated microcapsules in the rumen and abomasum was significantly better than other treatments. In gas production experiment for both diets, the tannic acid led to significantly higher gas production in comparison with other treatments. In batch culture *in vitro* experiment oil the amount of oil released from microcapsules were 78.72, 13.52 and 26.2% in simple, tannic acid and Ca^{2+}treated microcapsules respectively. DM degradability was not affected by fish oil in tannic acid treated microcapsules ($P>0.05$). DM degradability was significantly higher in tannic acid and Ca^{2+} treated microcapsules in comparison with the unprotected fish oil. The results showed that microencapsulation of fish oil with the suitable ingredients should led to better performance in case of animal performances. It can be concluded that the desirable dairy products in from of fatty acids are achievable by microcapsulation method similar to what was undertake in these experiments.

Keywords: Microencapsulation, Fish oil, Degradability, Gas production

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