

Metabolism and Nutrition: Enzymes Posters

502 Effect of wheat inclusion and xylanase supplementation of the diet on intestinal enzyme activity, nutrient retention and performance in laying hen from 25 to 47 wks of age. S. Mirzaei¹, M. Zaghari¹, S. Aminzadeh², M. Shivazad¹, M. P. Serrano³, and G. G. Mateos^{*3}, ¹Department of Animal Science, University of Tehran, Karaj, Iran, ²Department of Animal and Marine Biotechnology, National Institute of Genetic Engineering and Biotechnology, Tehran, Iran, ³Department of Animal Science, Universidad Politécnica de Madrid, 28040 Madrid, Spain.

A trial was conducted to examine the effects of increasing levels of wheat in the diet and xylanase (ES) supplementation on nitrogen and ether extract retention, pH of the GIT, productive performance from 25 to 47 wks of age, and enzyme activity at the small intestine level. The basal diets (from 25 to 33 wks and from 33 to 47 wks) consisted of soybean meal and corn, and the wheat was introduced in the experimental diets at expenses of corn, primarily. The experiment was completely randomized with 8 treatments arranged factorially with 4 levels of wheat (0, 23, 46, and 69% that resulted in a dietary xylan content of 1.8, 2.0, 2.2, and 2.4%, respectively) and 2 levels of xylanase [none or added at the dose recommended by the supplier] Lesaffre, Marquette-lez-lille, France]. Each treatment was replicated 5 times (6 hens). The inclusion of wheat in the diet did not influence average daily feed intake, egg production, or BW gain of the hens but decreased ($P \leq 0.05$) egg weight and egg mass. The reduction in egg weight with increased level of wheat in the first feeding period could be due to the low linoleic acid content (LIN) of some of the wheat diets (1.3, 1.1, 1.0, and 0.8%, respectively) as well as the antinutritional effects of xylans. The ES improved egg production, egg mass, and FCR ($P \leq 0.05$). Diet did not affect the pH of any of the segments of the GIT. Wheat inclusion or ES of the diet did not affect nitrogen or fat retention at 47 wk. The inclusion of wheat in the diet increased aminopeptidase activity ($P \leq 0.01$) in the duodenum but not amylase or lipase activity. Enzyme supplementation did not influence enzyme activity. It is concluded that wheat with a high NSP content, supplemented with xylanase, could be used in diets for laying hens at levels of up to 69% without hindering productive performance. However, the level of linoleic acid has to be taken into account if egg weight is important when wheat is included in the diet in substitution of corn.

Key Words: intestinal enzyme activity, laying hen performance, egg weight, xylanase

503 Effect of wheat cultivars and enzyme supplementation on broiler chicks performance from 1 to 42 day of age. N. Saeidi, A. Karimi*, G. Sadeghi, and A. Vaziri, *Animal Science Department, Faculty of Agr., University of Kurdistan, Sanandaj, Kurdistan, Iran.*

It has been well established that some wheat cultivar contained higher level of soluble non-starch polysaccharides which may adversely influence broiler chicks' performance, especially when wheat inclusion level in the diet exceed birds' tolerance level. An experiment was carried out using 3 common wheat varieties popular in Kurdistan region, Iran (known as Sardari, Zarrin and Azar) with or without enzyme preparation (0.30 g / kg of diet, Grindzyme GP 15000) on performance of broiler chicks during 1 to 42 d of age. A total of 416, one day old Ross 308 broiler chicks were randomly assigned to 8 dietary treatments, each replicated 4 times (in floor pen) in a completely randomized design (CRD) with 4×2 factorial arrangements. Wheat inclusion level in wheat-SBM based diets during starter and

grower period was set at 62.05 and 66.47%, respectively. Corn-SBM based diet (with or without enzyme supplementation) set as control treatments. Chick's body weight, feed intake and feed conversion ratio, after mortality adjustments, were determined in weekly intervals. At ages of 20 and 40d, 4 birds per treatment were sampled for measurement of relative weight of gastrointestinal organs and carcasses characteristics. Results showed that birds fed corn-SBM basal diet had significantly ($P < 0.05$) higher feed intake during 1–21d, body weight at 21d, and daily gain during 1–21d compared with birds fed with wheat-SBM based diets; however, the difference among corn and wheat based treatments disappeared during 21–42d. The results also indicated that wheat cultivar did have significant ($P < 0.05$) impacts on birds' feed intake, feed conversion ratio and relative weight of different gastrointestinal organs. Results showed that addition of enzyme to the diet did not have significant ($P > 0.05$) influence on birds body weight; however, enzyme supplementation significantly ($P < 0.05$) improved feed conversion ratio and increased ileum relative weight (%). In conclusion, the results showed the wheat variety has significant effects on birds' performance and addition of enzyme to the diet has a potential to improve feed utilization.

Key Words: broiler, corn, enzyme, performance, wheat

504 True ileal amino acid digestibility of ingredients in broilers in the presence or absence of a mono component protease. M. Iwaniuk*¹, C. R. Angel¹, S. L. Vieira², and N. E. Ward³, ¹University of Maryland, College Park, ²Universidade Federal do Rio Grande do Sul, Porto Alegre, RS, Brazil, ³DSM Nutritional Products, Parsippany, NJ.

A study was conducted to evaluate the true amino acid (TAA) digestibility of individual ingredients for broilers. Straight run Ross 708 broilers were raised to 17 d in floor pens and assigned to battery pens in a completely randomized design of 12 treatments (Trt), 8 replicates of 7 birds per pen. A nitrogen free diet (NFD) was formulated with 0.3% TiO₂ as a marker. The corn-starch, sucrose and SolkaFlock in the NFD diet were replaced in part by the ingredients being tested such that all the protein in the diet came from the tested ingredient. Ingredients were added to achieve 20% protein for the high protein ingredients or to a maximum of 96% of the diet for the low protein ingredients. Ingredient percentages tested in the final diets were: 42% soybean meal (SBM), 40% meat and bone meal (MBM), 75% corn distiller dried grains (DDGS), 96% corn and 96% bakery by-product meal (BPM). Each Trt was supplemented or not with 200 ppm of a mono component serine protease (RONOZYME ProAct™ CT, DSM Nutritional Products, containing 75,000 protease units/g of enzyme product). Birds were fed the diets for 4 d. At 22 d birds were euthanized and the distal half of the ileal content collected, pooled by pen and freeze-dried. Statistics were done with a 2 way ANOVA (5 ingredients with or without protease) and contrasts between diets with students T-Test. There was a main effect ($P < 0.05$) of protease on digestibility of Thr, Met, Cys, Lys, Arg, Ser, Val, Asp, Ile, and His. There were no protease by ingredient interactions except for Cys. Addition of the protease improved ($P < 0.05$) the digestibility of Thr, Cys, Met, Lys and Ser in SBM; Thr, Cys, Met, Ser and His in corn; Cys, Met, Arg, Ser, Val and His in DDGS; Cys, Met, Lys, Ser and His in MBM; and Met, Arg, and Ser in BPM. For SBM the TAA digestibility was improved ($P < 0.05$) from 75.2 to 83.2% for Thr, 74.9 to 81.2% for Cys, 83.1 to 86.3% for Met, 83.8 to 87.1% for Lys, and 80.6 to 85.4% for Ser with the protease.