

lowest DSFL inclusions (0, 33 or 66) but not at 100%. A significant interaction for FI (0–21 d) was similar to BW. The FCR was significantly reduced with increasing inclusion levels of DSFL (0 = 33 > 66 = 100). There was a significant interaction for AME and NR, but it was difficult to interpret. Similar observations were observed for G/F. In a second study the dietary preference of 4 M starter diets with 0, 33, 66 or 100% DSFL were compared with a M 5% fish meal (FM) starter diet. The test and FM diets were fed to 6 cages of 5 male Ross 308 broilers from 0 to 20 d and weekly FI determined. The statistical design was based on ANOVA for 4 diet comparisons. Diets with 33, 66 or 100% DSFL were preferred (>60% of feed consumed) compared with the FM diet. With a 0% DSFL diet, this preference was reduced to 40–50% compared with FM; with DSFL preference increasing with age. Both studies suggest that DSFL produced from municipal waste was an acceptable ingredient for production of broilers and is preferred to a diet containing FM.

Key Words: dried soldier fly larvae, feed form, protein, broiler, preference

221 Withdrawn.

222 Influence of body weight at hatching and inclusion of oat hulls in the diet on growth performance and digestive tract traits of brown-egg laying pullets from 0 to 16 wk of age. Sara M. Rodado¹, Beatriz Saldaña¹, Pilar Guzmán¹, Husham A. Mandalawi¹, Raúl Rodríguez², Lourdes Cámara¹, and Gonzalo G. Mateos¹, ¹*Departamento de Producción Agraria, Universidad Politécnica de Madrid, Madrid, Spain*, ²*Ibérica de Tecnología Avícola (Ibertec) S.A.U, Valladolid, Spain*.

The influence of pre-incubated weight of eggs (EW) laid by 24 wk-old brown layer breeders and the inclusion (wt:wt) of 3% oat hulls (OH) in the diet on growth performance and gastrointestinal tract (GIT) traits were studied in pullets reared under stressful conditions from hatching to 16 wk of age. The initial BW of the pullets resulting from these eggs was of 29.9 and 38.2 g for the 2 extreme groups. The stress applied consisted in using a prolonged (8 h) transport time from the hatchery to the experimental facility, reducing barn temperature at night from placement to 7 d of age, and late beak trimming of the pullets (18 d). Growth performance, pullet uniformity, and GIT traits were measured by period (0 to 5 wk, 5 to 10 wk, and 10 to 16 wk of age) and cumulatively. Data were analyzed as a completely randomized design with treatments organized as a 7 × 2 factorial, with 7 groups of pullets that differed on pre-hatched EW (47 to 54 g with 1 g difference between groups) and 2 levels of OH inclusion (0 vs. 3%). Effects of EW on the variables studied were partitioned into linear and quadratic components. The stress conditions applied affected pullet growth, with BW at 5 wk of age that were as an average 27% lower than recommended by the genetic company (269 g vs. 367 g). Neither initial EW nor OH inclusion affected any of the variables studied. In summary, EW of young breeders did not affect growth performance, BW uniformity, or GIT traits of the resulting pullets from 0 to 16 wk of age. Eggs bigger than 47 g laid by young breeders can produce high quality pullets. Pullets fed diets with 3% OH performed equally to pullets fed the control diet, suggesting that the amount of fiber can be increased during the rearing period of brown egg pullets.

Key Words: gastrointestinal tract trait, egg weight, fiber inclusion, pullet breeder

223 Dietary selenium supplementation of breeders influences growth and selenium status of progeny. Mickaël Briens*, Florian

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This study aimed to evaluate the effect of selenium sources fed to breeders muscle Se status and growth performances of their progeny. The breeders were divided into 3 groups differing by the dietary Se source as followed: sodium selenite (SS), selenized-yeast (SY) and hydroxy-selenomethionine or HMSeBA (SO). Each breeders group provided 290 day-old chicks. At d 0, 30 chicks per group were selected to measure muscle Se content and the 260 remaining chicks were distributed into 13 replicates pens of 20 chicks for 21 d. Broilers from the 3 groups received the same standard broilers diet to observe only the effect of breeders Se nutrition. On D12 and 21, growth performances were measured and one chick per pen was selected to measure breast muscle Se content. The breeders Se source had no effect on the body weight at hatch, body weight gain or feed intake during the entire experimental period ($P > 0.05$). However, feed conversion ratio (FCR) of broilers issued from breeders fed with SO showed significantly improvement between D0 to 12 and D0 to 21 comparatively to SS ($P < 0.05$). Muscle Se content of day-old broiler chicks was higher for SO group compared with other treatments and higher for SY group compared with SS ($P < 0.05$). At 12 and 21 d of experiment, the muscle Se content was similar between each group and was decreased compared with hatch level ($P < 0.05$). In addition, muscle Se content of broiler at one-day-old appeared to be significantly related to FCR for the periods: D0 to 12 and D0 to 21 ($P < 0.001$). These results showed the higher ability of HMSeBA compared with other Se source in breeders' diet to improve chicks' muscle Se content at hatch which is related to FCR improvement during 0–21 d period of growth.

Key Words: selenium, hydroxy-selenomethionine, broiler breeder, progeny

224 Feeding ingredients with variable starch digestion rate affect the expression of hepatic fat and glycogen metabolism genes in broiler breeder pullets. Aman Deep*, Andrew G. Van Kessel, and Henry L. Classen, *University of Saskatchewan, Saskatoon, Canada*.

Broiler breeders are often fed every 48 h during the rearing period to maintain optimum body weight. However, this practice is expected to promote postprandial nutrient storage and reutilization which is not energetically efficient and may contribute to metabolic stress. Previous research has demonstrated that feeding a pea- (slowly digested starch) in contrast to a wheat-based diet (rapidly digested starch) to broiler breeder pullets reduces maximum liver weight, and fat and glycogen content achieved over the period of 48 h post-feeding. The present study used liver samples from the same birds and examined the effect of pea- and wheat-based diets on relative abundance of genes encoding for synthesis, lysis and export of hepatic fat [malic enzyme (ME), acetyl-CoA carboxylase (ACC), VLDL-apolipoprotein (APOVLDL) and glycogen (glycogen synthase (GS), glycogen phosphorylase (GP)] using quantitative PCR. Ross 308 broiler breeders (384) were randomly assigned to 24 pens and fed a common starter ration on an ad-libitum basis from 0 to 3 wk of age. Thereafter (3–13 wk) either pea- or wheat-based diet was fed on an every other day basis. At 89 d of age, liver samples (4 birds/treatment/time) were collected at 1 h before and 1, 2, 4, 8, 12, 16, 20, 24, 26, 28, 32, 36, 40 and 44 h after feeding, snap frozen in liquid nitrogen and stored at -80°C for gene expression analysis. Data were analyzed as a factorial arrangement (2 diets, 15 times) and the level of significance was fixed at $P \leq 0.05$ unless otherwise stated. The relative expressions of ME, ACC, APOVLDL, and GP were affected by time after feeding and reduced by feeding the pea-based diet over the period of 48 h. A trend for increased expression of GS ($P = 0.08$) was noted in