202 Performance and oxidative stability effects of synthetic antioxidant in broilers fed diets containing either oxidized or non-oxidized fat. M. K. Manangi*[1], M. Vazquez-Anon[1], T. Wineman[1], M. Wehmeyer[1], J. D. Richards[1], S. Carter[1], and C. Owens[2], *[1]Novus International Inc., St. Charles, MO, [2]University of Arkansas, Fayetteville.*

A 42d study was conducted to determine the performance and oxidative stability effects of synthetic antioxidant {Santoquin M6 containing 66.6% Ethoxyquin (AOX)} in broilers fed diets containing either oxidized or non-oxidized fat. A total of 640 Ross-708 male chicks were assigned to 4 treatments with 8 pens/treatment and 20 chicks/pen. The study was carried out as 2 × 2 factorial design with 2 sources (oxidized vs. non-oxidized) of fat and 2 levels (0 vs. 125ppm) of AOX. The treatments consisted of: non-oxidized fat with no AOX, T1; non-oxidized fat with AOX; T2, oxidized fat with no AOX, T3; oxidized fat with AOX, T4. Soybean oil was used as a source of fat. For T3 and T4 diets, soy oil was oxidized to contribute 5mEq peroxide/kg in the starter and 7mEq peroxide/kg in the grower and finisher diets. Thiobarbituric acid reactive substances (TBARS, a measure of lipid peroxidation) were assayed in breast meat from 4 birds per pen as a measure of meat oxidative stability. No interaction ($P > 0.05$) was observed for source and level on performance variables, and breast meat TBARS. Main effects (source and level) indicate that feeding oxidized fat reduced feed intake by 200g ($P < 0.01$) and weight gain by 140g ($P < 0.01$), and increased TBARS in 10d old refrigerated pre-cooked meat by 1.7µmole malondialdehyde (MDA)/kg meat ($P = 0.07$)) and in 1d old refrigerated cooked meat by 20.4µmole MDA/kg meat ($P < 0.01$) compared with birds fed non-oxidized fat. Supplementing 125ppm synthetic AOX improved feed intake by 140g ($P = 0.02$) and weight gain by 70 g ($P = 0.07$), and decreased TBARS in 10d old refrigerated pre-cooked meat by 2.0µmole MDA/kg meat ($P = 0.04$) and in 1d old refrigerated cooked meat by 19.6µmole MDA/kg meat ($P < 0.01$) compared with birds fed zero synthetic AOX. Overall, the AOX effectively improved the broiler performance, and also the oxidative stability of the precooked and cooked meat compared with chicks fed no synthetic AOX.

Key Words: antioxidant, TBARS, Santoquin, breast meat

203 Differences among origins on nutritional and quality parameters of soybean meal. G. G. Mateos*[1], M. González[2], S. Sueiro[2], M. Hermida[2], J. Fickler[3], P. G. Rebollar[1], M. P. Serrano[1], and R. P. Lázaro[1], *[1]Universidad Politécnica de Madrid, Madrid, Spain, [2]Laboratorio Mouriscade, lalín, Pontevedra, Spain, [3]Evonik, Hanau, Germany.*

Soybean meal (SBM) is the main protein source in livestock feeds. United States (USA), Brazil (BRA), and Argentine (ARG) are the major SBM exporter countries. The nutritive value of SBM varies because genetics, environment, farming conditions, and processing of the beans influence strongly the content and availability of major nutrients. The present research was conducted to determine the influence of origin (USA, BRA and ARG) on nutritive value and protein quality of SBM. Samples (n = 385) were collected during a 4-yr period and analyzed for major dietary components, at the same laboratory and by the same technician, following AOAC procedures (Mouriscade, Spain). Amino acids (AA) were analyzed by NIR technology (Evonik, Hanau, Germany). On DM bases, USA meals (n = 148) had more CP (53.9 vs. 51.6 vs. 52.7%; $P \leq 0.001$) and less NDF (8.8 vs. 10.7 vs. 12.0%; $P \leq 0.001$) than ARG (n = 126) and BRA meals (n = 110). Sucrose and stachyose content was higher, and raffinose lower, for USA than for ARG and BRA meals (8.1 vs. 7.6 vs. 6.5%; 6.4 vs. 5.6 vs. 5.3% and 1.09 vs. 1.31 vs. 1.57%, respectively; $P \leq 0.001$). The USA meals had more P (0.79 vs. 0.69 vs. 0.74%; $P \leq 0.001$) than the BRA with ARG being intermediate. Also, BRA meals had more Fe (201 vs. 127 and 133 mg/kg; $P \leq 0.001$) but less K (2.3 vs. 2.6 and 2.5%; $P \leq 0.001$) than ARG and USA. The USA meals had higher KOH solubility (87.3 vs. 82.5 and 83.6%; $P \leq 0.001$), protein dispersibility index (19.9 vs. 17.1 and 15.3%; $P \leq 0.001$), and trypsin inhibitor activity (3.9 vs. 3.0 and 3.0 mg/g; $P \leq 0.001$) than ARG or BRA SBM. The amino acid profile (% CP) varied with the origin. Lysine (6.15 vs. 6.09 vs. 6.05%), met+cys (2.86 and 2.86 vs. 2.80%), thr (3.91 and 3.93 vs. 3.88%), trp (1.36 vs. 1.37 vs. 1.34%) and the content of these 5 key AA was higher ($P \leq 0.001$) for USA and ARG than for BRA, respectively. It is concluded that SBM of USA origin have a higher feeding value (protein quality indicators, less fiber and more sucrose, phosphorus, CP, and indispensable AA content) than South American meals. Thus, the origin of the beans should be specified in feed tables for accurate and precise formulation of diets by the feed industry.

Key Words: soybean meal, protein quality, nutritive value

204 Effects of the main cereal and type of fat of the diet on productive performance and egg quality of brown egg-laying hens from twenty-two to fifty-four weeks of age. A. Pérez-Bonilla[1], M. Frikha[2], C. Jabbour[2], S. Mirzaie[2], H. Irandoust[2], J. García[1], and G. G. Mateos*[2], *[1]Camar Agroalimentaria S.L., Toledo, Spain, [2]Universidad Politécnica de Madrid, Madrid, Spain.*

The influence of the main cereal and supplemental fat of the diet on productive performance and egg quality was studied in 756 brown-egg laying hens from 22 to 54 weeks of age. The experiment was conducted as a completely randomized design with 9 treatments arranged factorially with 3 cereals (dented corn, soft wheat, and barley) and 3 types of fat [soy oil (SBO), acidulated soapstocks (AOS), and lard]. Each treatment was replicated 4 times (21 hens per replicate). All diets were formulated to have similar nutrient content except for linoleic acid that ranged from 0.76 to 3.4% depending on the combination of cereal and fat source used (wheat and lard vs. corn and SBO). Productive performance and egg quality traits were recorded every 4-wks and BW was measured at the beginning and at the end of the experiment. For the entire experimental period egg production (92.9 vs. 92.1 vs. 91.5%), egg weight (64.5 vs. 64.1 vs. 63.6%), and egg mass (59.9 vs. 59.1 vs. 58.2) were similar for all treatments. Hens fed the wheat and lard diet showed the lowest numerical values (62.8 vs. 64.0, for the mean of the other treatments). Body weight gain was higher for hens fed corn and wheat than for hens fed barley (238 vs. 243 and 202 g; $P \leq 0.05$). Mortality was not influenced by diet. Source of fat did not affect any of the performance variables studied, except for BW gain that was higher for hens fed lard than for hens fed SBO and AOS (251 vs. 221 and 210 g; $P \leq 0.05$). Egg quality variables were not influenced by diet except for yolk color that was higher for hens fed corn than for hens fed wheat or barley (9.0 vs. 8.3 and 8.3; $P \leq 0.001$) and for hens fed lard than for hens fed SBO or AOS (8.9 vs. 8.5 and 8.2; $P \leq 0.001$). It is concluded that the 3 cereals and the 3 fat sources tested can be used indistinctly in diets for laying hens provided that a minimum amount of linoleic acid is used. The results indicate that brown egg laying hens do not need more than 1.0% linoleic acid in the diet to maximize egg size and egg production.

Key Words: cereal, fat source, linoleic acid, hen performance, egg weight