

Nonruminant Nutrition: Feed Additives

401 Pre- and postweaning flavor exposure affects piglet performance after weaning. D. Solà-Oriol¹, L. Mesas², A. Ortiz*², J. J. Mallo², and J. F. Pérez¹, ¹SNiBA. *Departament de Ciència Animal i dels Aliments, Universitat Autònoma de Barcelona, Bellaterra, Spain, ²Norel, Madrid, Spain.*

The aim of the present study was to evaluate the importance of flavor exposure during gestation and lactation on piglet performance after weaning. The effect of Fluidarom 1003 inclusion (375 g/Tm; 15% of anise as active ingredient) on piglet performance after weaning was studied following a 2 × 2 factorial arrangement where the main factors were the inclusion of Fluidarom 1003 to the sows diet or the postweaning diets. A total of 80 crossbred sows were offered Fluidarom 1003 flavored (F, n = 40) or control (C, n = 40) feed during last 42 d of gestation and the entire lactation (28 d). Creep-feed (F or C) was offered to each litter according to the sow treatment. After weaning, a total of 480 piglets were offered F or C feed for 35 d, resulting in FF, CF, FC and CC piglets (n = 12). Litters were standardized in number and weight by cross fostering within each treatment. Sow and litter performance was controlled until weaning. After weaning, piglets were distributed into blocks according to initial BW, and feed intake and BW of piglets was weekly monitored to calculate ADFI, ADG and feed to gain ratio (FGR). Performance data was analyzed with ANOVA by using the GLM procedure of SAS taking into account pre- and postweaning exposure to Fluidarom 1003. No differences were observed between treatments on sow and litter performance during the gestation and lactation periods ($P > 0.10$). Prewearing, but not postweaning exposure to Fluidarom 1003 increased postweaning BW from 7 to 35d (+5.8%; $P < 0.01$). Higher ADFI (+17.7%; $P = 0.001$) and ADG (+14.9%; $P = 0.002$) was observed for piglets FF and FC than CC at the end of the prestarter (0 to 14d post-weaning) due to the preweaning exposure. Higher ADFI (+6.7%) was observed for piglets FF, FC and CF than CC for starter period (14 to 35d; FF = 742, FC = 723, CF = 722 and CC = 650; $P < 0.01$). Overall, higher ADFI (+8.8%) was observed for piglets FF, FC and CF than CC for the entire period (0 to 35d; FF = 564, FC = 548, CF = 537 and CC = 485; $P < 0.01$) due to the pre- and postweaning exposure ($P < 0.01$). It is concluded that the pre- and postweaning exposure to Fluidarom 1003 may improve pig performance after weaning.

Key Words: flavor, learning, piglet

402 Effects of a dietary blend of antioxidants on carcass characteristics and meat quality in pigs fed a high oxidants diet. T. Lu*¹, A. F. Harper¹, J. Zhao², J. M. Scheffler¹, R. A. Dalloul¹, and M. J. Estienne¹, ¹Virginia Tech, Blacksburg, ²Novus International Inc., St. Charles, MO

The study aimed to determine the effects of dietary supplementation with a blend of antioxidants (AOX) on carcass characteristics and meat quality in finishing pigs fed a high oxidants diet. Eighty crossbred barrows (10.9 ± 1.4 kg BW, 36 ± 2 d) were randomly allotted to 4 treatments with 5 pens of 4 pigs per treatment. Pigs in 3 treatment groups were fed a high oxidants diet containing oxidized soy oil (5%) and a source of PUFA (3.5%). Treatments included: 1) high oxidants diet with vitamin E at 11 IU/kg (VE); 2) high oxidants diet with Agrado Plus (Novus International, St. Charles, MO; a proprietary blend of ethoxyquin and propyl gallate) at 135 mg/kg (AOX); 3) high oxidants diet with AOX and VE (AOX+VE); and 4) standard control with no oxidized soy oil or PUFA (SC). At the end of the 118 d trial, 2 pigs from each pen were harvested for determination of loin quality, belly quality and carcass

characteristics. Data were analyzed using GLM of SAS with Tukey's multiple comparison. Pigs fed the VE diet showed symptoms of "yellow fat disease" in most adipose tissues. Compared with SC, VE pigs ($P < 0.05$) had decreased dressing percentage (65.7% vs. 74.2%), lighter carcass weights (61.5 vs. 109.3 kg), less 10th rib back fat (1.41 vs. 2.78 cm), less lean body mass (27.5 vs. 44.6 kg), and smaller loin eye area (25.2 vs. 44.3 cm²). In addition, higher water content (77.4% vs. 74.7%), and less extractable fat content (0.95% vs. 2.43%) were found in longissimus muscle of VE pigs ($P < 0.05$). However, drip loss with the VE treatment was less than SC (0.46% vs. 3.98%, $P = 0.02$), which was associated with a tendency for a higher muscle pH_{24h} (5.74 vs. 5.54, $P = 0.07$). Diet supplementation with the blend of antioxidants (AOX and VE+AOX) attenuated these effects such that the characteristics were similar to SC ($P > 0.05$). However, the SC pigs had redder loin muscle color (higher a* value) and firmer bellies than the AOX and AOX+VE pigs. Feeding the oxidative stress diet caused a series of detrimental changes in carcass characteristics and meat quality, while AOX addition attenuated many of these independent of VE addition.

Key Words: pig, antioxidant, meat quality

403 Efficacy of a purified enzyme to detoxify fumonisins in swine diets. U. Hofstetter*¹, K. Naehrer¹, and C. A. Mallmann², ¹Biomim Holding GmbH, Herzogenburg, Austria, ²Universidade Federal de Santa Maria, Santa Maria, Brazil.

A 42 d feeding trial was conducted at the swine experimental unit of SAMITEC, University Santa Maria, Brazil, to evaluate the efficacy of a fumonisin degrading enzyme (FUMzyme) to diminish the toxic effects of fumonisin B1 (FB1) on the performance of growing piglets. Fumonisin was added (50 µg/kg) to the basal ration and the enzyme was added at 0.0% FUMzyme (control), 0.25% FUMzyme and 0.5% FUMzyme for the 3 treatments. A total of 30 piglets with an initial weight of 11.6 kg were used. There were 10 piglets per treatment with 1 piglet per replication (1 pig per 0.70 m² pen). Each pen was equipped with semiautomatic feeders and drinkers with feed and water given ad libitum. Parameters measured included ADFI, BW, ADG and G:F, relative weight of organs (liver and lungs) and hematological analysis (total plasmatic protein and sphinganine/sphingosine ratios (Sa/So)). These parameters were analyzed by analyses of variance (ANOVA). Differences between means were compared by Tukey's test ($P \leq 0.05$). ADFI of piglets consuming the control ration (0.0% FUMzyme) was reduced throughout the experimental feeding period. Piglets consuming either ration containing the enzyme had a significant higher ADFI (1.26 kg and 1.21 kg) than piglets fed the control ration (0.83 kg). Piglets fed rations containing either 0.25% or 0.50% of the FB1 degrading enzyme presented superior BW (44.68 kg and 42.82 kg) and ADG (0.79 kg and 0.74 kg) compared with piglets fed the control ration (BW, 28.88 kg and ADG, 0.41 kg). There were no statistical significant differences in lung weight and total plasmatic proteins between treatments. Piglets fed the control ration had statistical significant higher G:F (0.51), relative liver weight (2.93 kg) and Sa/So ratio (8.34) compared with piglets in the other 2 treatments (G:F, 0.63 and 0.61, relative liver weight 1.89 kg and 1.77kg, Sa/So 6.72 and 6.25). Performance of piglets fed a FB1 contaminated ration was improved by the inclusion of either level (0.25% and 0.5%) of FUMzyme. It could be concluded that the negative effects of fumonisin B1 on piglet performance can be alleviated by inclusion of a fumonisin degrading enzyme.

Key Words: fumonisin, piglet

404 Effect of dietary propolis supplementation on growth performance, blood profiles, relative organ weight, and meat quality in broilers. H. L. Li*, H. C. Jang, and I. H. Kim, *Department of Animal Resource & Science, Dankook University, Cheonan, Choongnam, South Korea.*

The objective of the current study was to evaluate the effects of dietary propolis on growth performance, blood profiles, relative organ weight and meat quality in broilers. A total of 720, 1-d-old male ROSS 308 broiler chicks (BW = 40.1 ± 0.1 g) were randomly allocated to 1 of 5 dietary treatments (9 pens with 16 broilers per pen). Dietary treatments were (1) NC, negative control diet; (2) PC, NC + 0.01% avilamycin; (3) PRO1, NC + 0.05% propolis; (4) PRO2, NC + 0.10% propolis; (5) PRO3, NC + 0.20% propolis. The broilers were weighed and feed intake was recorded by pen on d 0, 14, and 28 to calculate growth performance. At the end of the experiment, 27 broilers were randomly selected from each treatment (3 birds per pen) and blood samples were collected for

measuring white blood cells, red blood cells, lymphocyte and immunoglobulin G concentration. After blood collection, the same broilers were weighed individually and slaughtered for the measurement of relative organ weight and meat quality. Birds fed PRO2 diet had a higher ($P < 0.05$) body weight gain (1 to 2 wk, 392 vs. 372 g; 1 to 4 wk, 1481 vs. 1430 g) and a lower ($P < 0.05$) feed conversion ratio (1 to 2 wk, 1.439 vs. 1.505; 1 to 4 wk, 1.510 vs. 1.582) than those fed NC diet during 1 to 2 wk and 1 to 4 wk. A higher ($P < 0.05$) blood IgG (1.80 vs. 1.45 mg/dL) concentration was observed in PRO2 treatment compared with that in NC treatment. The relative weight of liver (3.69 vs. 3.13%) and abdominal fat (1.72 vs. 1.45%) in PRO2 was higher ($P < 0.05$) than in NC. No differences ($P > 0.05$) were found on meat quality among treatments. In conclusion, results indicated that the use of propolis at the 0.10% level increased growth performance, blood IgG concentration and relative organ weight in broilers.

Key Words: broiler, growth performance, relative organ weight