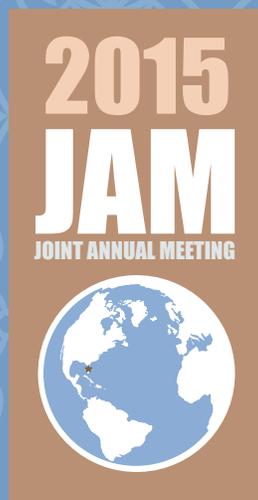




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Animal Health: Swine health and transition cows

237 Protected sodium butyrate may reduce *Salmonella* spp. excretion in contaminated fattening pig farms. M. Puyalto*¹, R.C. Mainar-Jaime², S. Andres-Barranco³, E. CREUS⁴, and J. J. Mallo¹, ¹Norel S.A., Spain, ²Department of Animal Pathology, University of Zaragoza, Zaragoza, Spain, ³AgriFood Research and Technology Centre of Aragon, Spain, ⁴Agrofestiic S.L., Spain.

The objective of this study was to assess the level of *Salmonella* shedding and exposure in a fattening unit when protected sodium butyrate was added to the diet of the pigs. The study was carried out in a commercial *Salmonella*-infected fattening unit (8 pens, 110 pigs). Feed with 70% sodium butyrate protected with vegetable fat (3 kg/t) was administered to animals from 4 randomly selected pens throughout the whole fattening period (4 mo) (TG). Pigs from the remaining 4 pens were fed with regular diet without additive (CG). Individual serum and fecal samples were collected at 30, 60, and 90 d of fattening period and at slaughter. Bacteriology on fecal samples was performed following the ISO 6579:2002 protocol. Serum samples were analyzed by means of an indirect ELISA and 3 cutoff values were used (OD% ≥ 10 , ≥ 20 and ≥ 40). Chi-squared analyses were performed to compare microbiological and serological results between groups at different time periods. A difference was considered significant when the one-tail *P*-value was ≤ 0.05 . In addition, a repeated measures analysis was used to estimate differences in mean OD%, after taking into account sampling times and the interaction treatment \times time. The levels of shedding were significantly lower for TG when compared with CG for all samplings but the second one (60 d). No significant differences between groups were observed when cut-off values of OD% ≥ 10 or %OD ≥ 20 were used. However, when OD% ≥ 40 was considered, significant differences in seroprevalence were observed for the sampling just before slaughter (CG 89.6% vs. TG 48%). Overall, a lower mean OD% value was observed for samplings at 60 and 90 d, and at slaughter in the TG (71, 66, and 46%, respectively) compared with the CG (88, 87, and 83%, respectively). The results indicate that the use of protected sodium butyrate at 3 kg/t may reduce the shedding of *Salmonella* spp. under this farm conditions, and therefore the risk of contact of the animals with this pathogen, as suggested by serological results.

Table 1 (Abstr. 237). Number of positive *Salmonella* animals/no. of total animals (% positive *Salmonella*)

Treatment	30 d	60 d	90 d	Slaughter
CG	19/29 (65.5%)	5/21 (23.8%)	7/21 (33.3%)	36/48 (75%)
TG	12/28 (42.8%)	2/21 (9.5%)	1/22 (4.5%)	29/50 (58%)
<i>P</i> (one-tail)	0.04	0.2	0.01	0.05

Key Words: *Salmonella* spp., sodium butyrate protected

238 Rapid cooling after acute hyperthermia alters intestinal morphology and may negatively affect pig health. J. S. Johnson*, A Sapkota, and D.C. Lay Jr., *USDA-ARS Livestock Behavior Research Unit, West Lafayette, IN.*

Heat stress (HS) reduces livestock welfare and productivity and can negatively affect pig health. The study objective was to determine the effects of 2 HS recovery methods (rapid vs. gradual cooling) on pig welfare after acute hyperthermia. In 4 repetitions, 36 barrows (88.7 \pm 1.6 kg BW) were exposed to thermoneutral conditions (TN; n = 3/rep;

19.5 \pm 0.1°C) for 6h, or HS (36.4 \pm 0.1°C) for 3h, followed by a 3h recovery period of rapid cooling (HSRC; n = 3/rep; immediate TN exposure and water dousing) or gradual cooling (HSGC; n = 3/rep; gradual decrease in HS room temperature to TN). To evaluate heat dissipation, a thermal circulation index was calculated using gastrointestinal tract (T_{GI}), ambient (T_A), and skin (T_{SKIN}) temperatures collected every 15 min [TCI; $(T_{SKIN} - T_A)/(T_{GI} - T_{SKIN})$]. In repetitions 1 and 2, blood was collected at 60, 180, 210 and 240 min for lipopolysaccharide (LPS) analysis, and then pigs were euthanized at 360 min and duodenum, ileum and colon tissue was collected to determine intestinal morphology. HS treatment reduced ($P < 0.02$) TCI in HSRC (-0.69) and HSGC pigs (-0.64) compared with TN controls (1.31); however, during recovery HSRC reduced TCI ($P < 0.01$; 53.5%) compared with HSGC and TN treatments. In the duodenum and ileum, HSRC and HSGC treatment reduced villus height ($P < 0.01$; 29.4 and 21.1%, respectively) and increased crypt depth ($P < 0.01$; 56.9 and 32.2%, respectively) and villus width ($P < 0.01$; 30.5% and 32.5%, respectively) compared with TN controls. In addition, HSRC reduced duodenal and ileal villus height ($P < 0.01$; 27.6 and 38.2%, respectively) and increased crypt depth ($P < 0.01$; 43.8 and 35.2%, respectively) compared with HSGC pigs. While no colon crypt depth differences were observed for HSRC and HSGC pigs (156.8 μ m), crypt depth was reduced ($P < 0.01$; 37.1%) in HSRC and HSGC pigs compared with TN controls. During HS, circulating LPS was similar for all treatments ($P < 0.57$; 56.2 EU/mL); however, during recovery HSRC pigs had increased circulating LPS ($P < 0.05$; 68.5 and 52.4%, respectively) compared with TN and HSGC pigs. In summary, rapid cooling after acute hyperthermia reduces heat dissipation capacity, damages intestinal tissue, and increases circulating LPS compared with gradual cooling.

Key Words: heat stress, pig, recovery

239 Mycotoxin-contaminated diets affect immunity parameters of piglets. Simone Schaumberger*, Sabine Masching, and Ursula Hofstetter, *BiomIn Holding GmbH, Herzogenburg, Austria.*

Important aspects of more than one multi-mycotoxin in feed, are the synergistic and additive effects which may result in negative effects on immunity and liver health of animals. The aim of the feeding trial was to investigate the effects of a multi-mycotoxin contaminated diet on immune parameters and liver health in weanling piglets. Twenty-four female weanling piglets were randomly assigned to 2 groups with 12 piglets each. Piglets were assigned to a vaccination program including hog cholera, pseudorabies and foot and mouth disease. Naturally mycotoxin contaminated corn was used to prepare the feed. Groups were as following: negative control group (A) and a mycotoxin contaminated (ZEN 1183 ppb, DON 1740 ppb, FUM 988 ppb) feed group (B). Parameters evaluated included antibody titers for pseudorabies referred to as sample to negatives ratio (S/N 0.6 was defined as positive), plasma CD4+/CD8+, IL-2, TNF- α , IgA, IgG, IgM, total plasma protein (TP) and liver enzymes (ALT, AST). The ratio of S/N in group B was significantly higher compared with group A at d 42 ($P < 0.05$). There were no significant differences of plasma CD4+/CD8+ among the 2 groups. The plasma IL-2 levels of group B were significantly lower than group A at d 14, 28 and 42 ($P < 0.05$). The plasma TNF- α level of group B was significantly lower than group A at d 28 and 42 ($P < 0.05$). The IgA, IgG levels of group B were significantly lower than group A at d 28 and 42 ($P < 0.05$). There was no significant difference of IgM among the 2 groups. Plasma TP levels of group B were significantly