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yield but the IG had wider fat depth at GM and lower lean yield than EG with CM and IM being intermediate ($P < 0.05$). Intramuscular fat content was not affected by sex. It is concluded that the immunization against GnRF might be a good strategy to improve some traits desirable in pigs intended for dry-cured ham because, in gilts, it increased fat depth and, in males, it reduced feed:gain ratio in comparison with those surgically castrated.

Key Words: pig immunocastration, growth performance, carcass quality

M499 Is the lactation period the main variable responsible for reducing the efficiency of the swine production? Sergi López-Vergé, David Solà-Oriol, Laia Blavi*, and Josep Gasa, *Animal Nutrition and Welfare Service, Department of Animal and Food Sciences, Universitat Autònoma de Barcelona, Bellaterra, Spain.*

Pig body weight (BW) homogeneity across the entire production cycle plays an important role in the swine industry because it directly affects efficiency and farm occupation time, mainly in regards to the growing-finishing facilities. The aim of this study was to know if the BW variability is equally distributed along the pig productive life or is primarily important at one particular stage. A total of 433 crossbred piglets [Pietrain \times (Landrace \times Large White)] from 40 litters were used. All diets were offered ad libitum. During the nursery period, piglets were fed a diet formulated to contain 11.0 MJ/kg NE, 20.2% CP and 1.37 Lys. Thereafter, the animals were moved to a growing-finishing facility. Pigs were fed the same commercial growing and finishing diets (10.0 MJ/kg NE, 16.0% CP, 0.95 Lys). All animals were individually weighed from birth until slaughter at d 2 (CF; cross fostering), d 28 (weaning), d 42 (14 d post-weaning), d 63 (35 d post-weaning) and every 3 weeks until pigs were slaughtered. The relationship between BW at one stage and the next succeeding one along the whole cycle was analyzed by using the CORR procedure of SAS. Moreover, the variability at all periods was calculated taking into account the coefficient of variation (CV, %) by using the MEANS procedure of SAS. A strong relationship was observed between 2 consecutive steps along the whole production cycle (Pearson Correlation Coefficient (r) ranging from 0.85 to 0.96 ($P < 0.001$) until the first group of pigs were slaughtered), except for the lactation period (from birth to weaning, $r = 0.46$, $P > 0.001$). At the same time, the CV was higher at the first stages (22.17% until 35 d post-weaning) and then decreased until slaughter (8.42%). Results showed that the events occurred in the first stages of pig life, but especially during the lactation period (in terms of variability), have a huge effect along the subsequent performance of pigs, suggesting a more accurate management for the smallest piglets just after birth.

Key Words: correlation, piglet, variability.

M500 Evaluation of the efficacy of sodium heptanoate or butyrate in front of an enterotoxigenic *Escherichia coli* (ETEC) K88 oral challenge in piglets. P. López-Colom¹, L. Castillejos¹, M. Puyalto², J. J. Mallo^{*2}, and S. M. Martín-Orúe¹, ¹*Animal Nutrition and Welfare Service, Departament de Ciència Animal i dels Aliments, Universitat Autònoma de Barcelona, Bellaterra, Barcelona, Spain,* ²*Norel S.A., Madrid, Madrid, Spain.*

This study evaluated the efficacy of sodium heptanoate (HEPT'ON) or sodium butyrate (GUSTOR BP70; Norel S.A.) against ETEC K88 in weanlings. A total of 72 3-week-old piglets were divided into 24 pens and 3 experimental groups: Plain diet (CTR); supplemented with GUSTOR BP70 (BUT); or supplemented with HEPT'ON (HPT), both

at 3 kg/t and containing 70% of acid salt protected with vegetable fat. Intake and weight were monitored along 15 d. After one week, animals were orally inoculated with ETEC K88 (1×10^9 cfu) and fecal consistency and rectal temperature evaluated afterward. On d 4 and 8 post inoculation (PI) one animal per pen was euthanized to evaluate inflammatory response (TNF α and Pig-MAP) and counts of enterobacteria and *E. coli* in ileal-colonic contents and ileal mucosa scrapes. No significant differences were seen in performance although numerical values were higher for the experimental diets (217, 264 and 243 g ADFI and 117, 123 and 124 g ADG for CTR, BUT and HPT). No significant differences were found in fecal consistency, rectal temperature and inflammatory markers. Regarding microbiological changes, no significant differences were observed between treatments in the colon. Nonetheless, in ileum digesta, there were numerical differences ($P = 0.126$) with higher number of enterobacteria in both acids treatments at d 4 PI, that was correlated to an increase in the number of enterobacteria and *E. coli* recovered from the ileal scrapes (4.30, 5.88 and 5.46 log cfu *E. coli* for CTR, BUT and HPT, $P = 0.003$). This increase, however, was not found at d 8 PI when even a decrease in the numerical values of *E. coli* in ileal digesta was seen for BUT treatment (6.58, 6.01 and 6.93 log cfu for CTR, BUT and HPT, $P = 0.036$) that also showed a tendency to improve the colonic consistency ($P = 0.099$). These results suggest the potential of BUT to improve the recovery of the animals after an ETEC challenge. More studies under field conditions with a higher number of animals would be needed to confirm the numerical differences found in performance.

Key Words: *Escherichia coli* K88, sodium heptanoate, sodium butyrate

M501 The use of multiple imputation for the accurate measurements of individual feed intake by electronic feeders. Shihui Jiao^{*1}, Christian Maltecca¹, Yijian Huang², and Kent A. Gray², ¹*North Carolina State University, Raleigh, NC,* ²*Smithfield Premium Genetics, Rose Hill, NC.*

Obtaining accurate individual feed intake records is a key first step in achieving genetic progress toward a more efficient pig for nutrient utilization. Feed intake records collected by electronic feeding systems contain errors (extreme values or outliers), which are due to feeder malfunction or animal movements. In this study, we introduce a new feed intake data editing strategy to replace errors and missing observations occurring in feed intake data, based on multiple imputation methods. Compared with the well-established linear mixed model (LMM) approach, multiple imputation either by using conditional distribution (MI) or by chained equation (MICE) results in increased accuracy of data adjustment in simulated phenotypes with artificially introduced errors. Feeder visit records in the simulated data sets were sampled from a data set including individual pig feed intake visits collected by Smithfield Premium Genetics from year 2004 to 2013. Three scenarios were considered in the analysis with 5%, 10% and 20% error visits simulated. Each scenario was replicated 5 times. Accuracy of the error-adjustments was measured as correlation between the true error-free daily feed intake (DFI) or average daily feed intake (ADFI), and the adjusted ones. Multiple imputation methods outperformed the linear mixed model approach in all scenarios with average accuracies of 96.71%, 93.45% and 90.24% obtained with MI and 96.84%, 94.42% and 90.13% obtained with MICE, compared with 91.0%, 82.63% and 68.69% using LMM for DFI with simulated error rate 5%, 10% and 20%, respectively. Similar results were obtained for ADFI. In conclusion, multiple imputation was introduced in this study as a more accurate