Impact of dietary diformates on the *E. coli* status in pigs – with special focus on sows

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Background and objectives Pathogenic bacteria are a significant cause of zoonotic diseases and cause major economic losses in the pork production chain, through reduced productivity, increased veterinary and hygiene control costs. Preventing their spread to the consumer requires special control measures during slaughter and processing, with the extra costs increasingly transferred back to the producer as financial penalties or the loss of the market for contaminated pigs. Improving gut health has been shown to be effective against intestinal pathogens, a strategy that was only possible through the removal of antibiotic growth promoters in feed and the targets to remove zinc oxide from the food chain. Creating and maintaining a healthy intestinal environment is now essential to productivity and food safety programs alike. According to a decade-long survey by the CDC, around 205,000 cases of food poising by *E. coli* occur annually in the US. Some of these cases can be traced back to pork products. *E. coli* can seriously impair animal and human health and it is a major vector for post-weaning diarrhoea in piglets. Biosecurity programs in pork production can reduce the risk to consumers. An important control point is within the pig gut itself, where dietary acidification offers considerable benefits. This formed the impetus for two trials.

Material and methods In the first trial, 600 sows on a commercial farm in Lower Saxony, Germany, were fed from the 100th day of gestation a gestation feed containing 1.0% potassium diformate (KDF, FORMI, ADDCON), known to reach the small intestine. On the 90th day of gestation, faecal samples of 6 sows were collected and analysed for *E. coli*. The feed containing KDF was given to the sows until the 4th day of lactation. Thereafter, faecal samples were collected and analysed again from the same 6 sows. In the second trial, 40 multiparous sows on a research farm in Saxony-Anhalt, Germany, were allocated to two equal groups and fed a commercial lactation diet from one week before farrowing until the piglets were weaned at 26 days. The test diet contained 0.8% sodium diformate (NDF, FORMI NDF, ADDCON). The lactation diet was fed according to a feeding curve, from the last week before farrowing to day 13 of lactation and thereafter *ad libitum*. On the 21st day of lactation, freshly excreted faecal matter was collected from all sows and analysed for *E. coli*. Data in both trials were analysed using the t-test and a significance level of 0.05 was used in all tests.

Results In the first trial, *E. coli* count in the faeces was by >90%, varying from 83%-100% which, due to this wide variation, was only a tendency (P=0.06). With a higher number of sows this impact would be significant. In the second trial, faeces of treated sows had a significantly lower (98%) *E. coli* count in the faeces between the control and treatment groups (P=0.0012).

Conclusion and discussion The use of dietary diformate salts is an effective and sustainable tool in improving gut health in sows, by reducing pathogen load, especially *E. coli*, at intestinal level and decontaminating the faeces of the sow and thus reducing the risk of cross-infection to the piglets. This supports data from Øverland *et al*., 2000 and Canibe *et al*., 2001 showed in piglets and growing-finishing pigs.

References

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