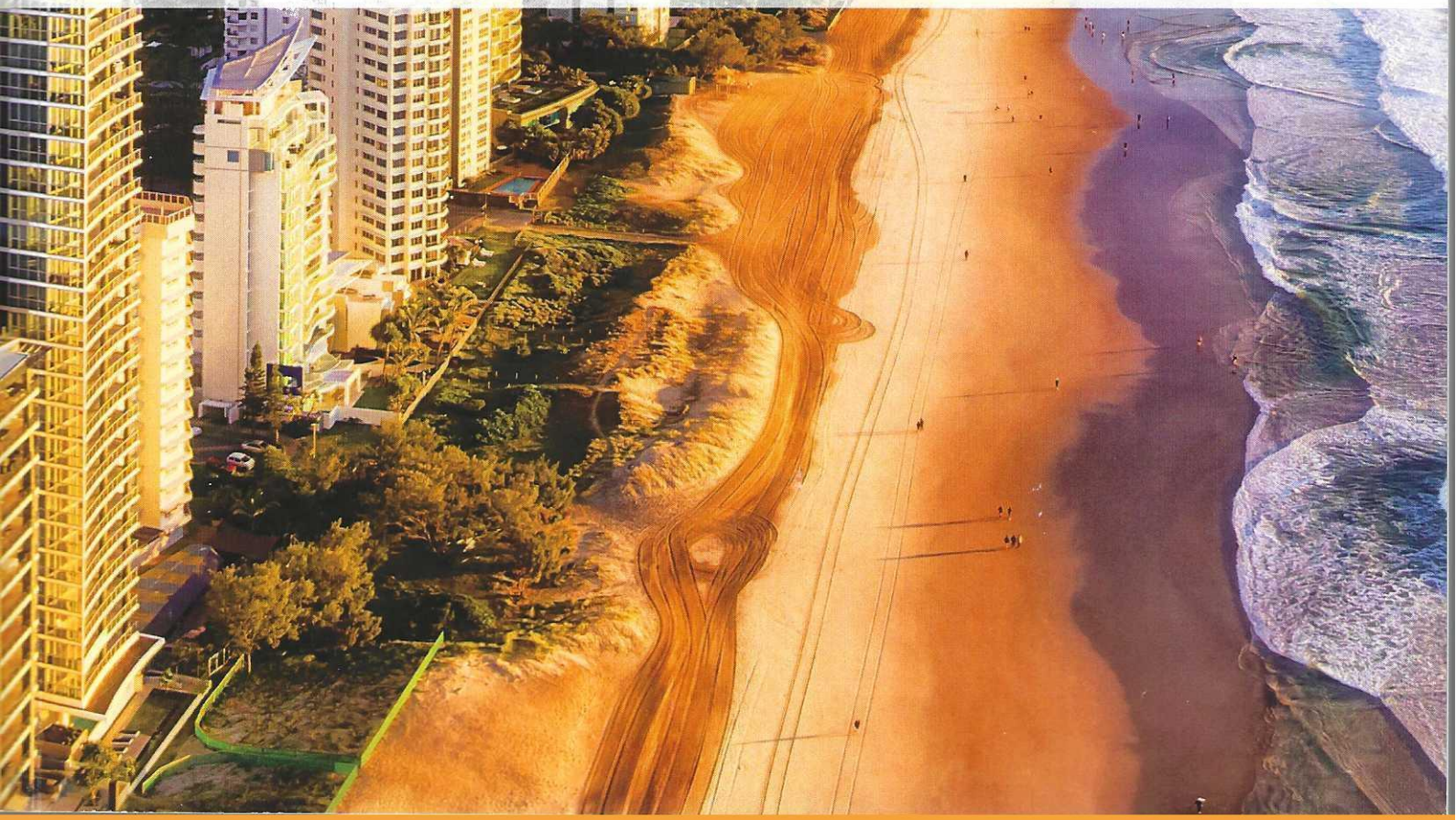
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Poster 9: The impact of an agglomerate of dietary sodium diformate and monolaurate on the faecal microbiome of lactating sows

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Introduction

Gut health is increasingly being shown to be effective against intestinal pathogens, a strategy that has only really been made possible through the removal of antibiotic growth promoters in feed. Creating and maintaining a healthy intestinal environment has become essential to productivity and food safety programmes alike[1]. The application of organic acids and their salts to diets for pigs has been studied extensively over decades. They are especially effective in maintaining growth performance since the ban on antibiotic growth promoters came into effect in Europe and this strategy is now applied in many countries worldwide. Numerous trials have demonstrated the mode and magnitude of action of organic acids in feed for pigs and has established effective doses for piglets, fattening pigs and sows, among them the use of diformates[2]. In addition, it is known that monolaurate has a strong antibacterial impact against various Gram-positive bacteria[3], making it a promising candidate as an additive or as an alternative to antibiotics for treatment of different diseases[4]. The gut microbiome, which is also represented to a great extent in the faecal microbiome, is a community of host-associated symbiotic microbes that fulfils several important roles in host metabolism and immune function[5]. Therefore, an increased understanding of the gut microbiota has the potential to have an impact on nutrition, feed efficiency and general health in pig farming[6]. The current study therefore investigates the impact of an agglomerate of sodium diformate and monolaurate on its effect on the faecal microbiome of sows during lactation.

Methods

Multiparous sows on a commercial farm in Australia were fed either a lactation diet, which contained a regular acidifier at 0.8% as control – or a test diet, which contained 1% of a sodium diformate-monolaurate agglomerate (traded as Formi 3G, ADDCON) instead. The diets were fed from the 90th day of gestation until weaning. Faecal samples (n=24) were collected on the 5th day of lactation. The reduction rates (%) of *streptococci* and *clostridia* on their relative abundance of the overall faecal microbiome were measured via the application of New Generation Sequencing (NGS) using Microgenetix. Data were analysed using the t-test and the Wilcoxon-Mann-Whitney test. A significance level of 0.05 was used in all tests.

Results and discussion

Mean abundance rates of specific pathogenic bacteria are shown in Table 1. The three main effects of the test diet were a significant ($p<0.018$) reduction of the relative abundance of clostridia spp. by 42.2% and of *streptococci* spp. by 42.5% ($p<0.013$), while the number of *streptococci* positive faecal samples dropped significantly ($p<0.002$) by 79.6%.

Table 1. Relative abundance (%) of *clostridia* spp. and *streptococci* spp. in the sow faecal microbiome

Diet	Control	Formi 3G	Difference	P
Clostridia	19.2[a]	11.2[b]	-42.20.	018
Streptococci	3.2[a]	1.8[b]	-42.5	0.013

Conclusion

The addition of the agglomerate of sodium diformate and monolaurate caused a significant improvement of the health status of sows, based on their faecal microbiome. The impact against the Gram-positive *streptococci* is especially noteworthy. This is in full agreement with earlier trials in Europe[7,8]. The combined inclusion of diformate and monolaurate may therefore not only provide a healthy gut in sows but might furthermore support a pork production chain with reduced zoonotic pathogen pressure. This will additionally help antibiotic reduction initiatives.

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