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The production of healthy slaughter pigs starts at farrowing

The most stressful time in the life of a slaughter pig is weaning. At weaning piglets are abruptly separated from the sow, co-mingled with piglets from other litters, moved to a new environment, and changed from highly digestible and palatable liquid milk from the sow, to a less digestible and palatable dry source of feed. This stress is exacerbated by the young age at weaning, when the immune system of the piglet is not yet fully developed. Piglets are consequently highly susceptible to diseases such as bacterial enteritis.

To prevent the development of bacterial enteritis, piglets are often given antibiotics before and during weaning. However, the use of antibiotics before and during weaning can paradoxically increase the risk of piglets developing bacterial enteritis. This is due to the damage caused to the piglet's intestinal microbiome by antibiotics, thus damaging an important natural defence against the growth of enteric pathogens such as *Escherichia coli (E. coli)* and *Clostridium perfringens.*

Managing bacterial enteritis by only concentrating on the piglet during and after weaning, disregards the important effect the sow has on piglet health during farrowing and lactation. The successful production of a piglet that survives weaning and grows efficiently to slaughter weight, starts with the sow.

Promoting a healthy microbiome

A healthy intestinal microbiome is the first line of defence against enteric infection in all animals. A piglet's gastrointestinal tract (GIT) at birth is sterile. The bacteria that colonise the GIT come from the environment of the farrowing house.

The sow's intestine, via her faeces, is an important contributor to the bacteria in the farrowing house. A sow has a mature immune system that will prevent pathogenic bacteria such as *E. coli* and *Clostridium perfringens,* which naturally reside in her intestine, from causing clinical disease in the sow. The farrowing house environment will, however, be contaminated with these pathogens via her faeces, increasing the exposure of the piglets to these pathogens.

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A sow with a healthy intestinal microbiome will seed the environment of the farrowing house with beneficial commensal intestinal bacteria, ensuring that the piglets develop a healthy intestinal microbiome. Feeding sows second generation probiotics from 90 days after insemination until weaning, has shown to significantly increase the survivability of piglets up to weaning, while significantly improving the weaning weights of piglets.

Immune responses of piglets

At weaning the immune system of piglets is immature. Linear 1-3 β-glucans are indigestible fibres consisting of linear chains of glucose molecules bound in a long chain via β-type glyosidic bonds. These glucose chains are not found naturally in a mammal's body. Linear 1-3 β-glucans present in feed will therefore elicit an immune response in the intestine, thus improving the ability of the intestinal immunity to fight challenges from pathogenic enteric bacteria.

Improving the immune response of piglets during weaning with linear 1-3 β-glucans, has been shown to decrease the clinical signs of diarrhoea in piglets challenged with pathogenic F18 *E. coli.* The survival of piglets challenged with *E. coli* can be further enhanced by combining the action of linear 1-3 β-glucans with the antibacterial action of encapsulated citric and formic organic acids. Citric and formic acid will directly kill *E. coli*.

Improving intestinal immunity of the sow has also been shown to enhance the survival of piglets. Feeding linear 1-3 β-glucans to sows from 30 days before farrowing to 24 days after farrowing has been shown to result in more piglets per/litter, piglets with greater weaning weight/litter, greater mean weaning weight gain/litter, and greater mean weaning weight gain/litter/piglet/day.

In conclusion

Prevention is better than cure. Improving the health of the sow's GIT via the use of probiotics and immune modulators will improve piglet health as a result of a healthier sow, which produces more milk, and by lowering the contamination of the farrowing house with pathogenic bacteria from the sow.

Maintaining the gut health of the piglets via the use of probiotics, encapsulated organic acids and immune modulation will maintain the gut health of piglets after weaning. This, in turn, will assist in improving feed conversion efficiency and the average daily gain of the pigs up to slaughter. Following a holistic approach for maintaining intestinal health in sows and piglets will have the added benefit of lowering antibiotic use on farm.

References available on request.
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