

Antisecretory Factor and diarrhea

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Background

Antisecretory Factor (AF) is an endogenously synthesized, ubiquitously expressed 43 kD protein capable of counteracting intestinal hyper secretion and inflammation. Protein AF was originally identified by its capacity to counteract cholera toxin induced hyper secretion during experimental conditions in enterotoxin-challenged, ligated loops of the small intestine of rodents and pigs (Lange et al., 1987). Clinical studies of man demonstrated that AF was also capable of mediating an anti-inflammatory effect (Björck et al., 2000). The major part of AF in plasma is preferably demonstrated in an inactive form, but AF is stimulated to activity after intestinal exposure to bacterial toxins or through the intake of *Specially Processed Cereals* (SPC). The increase of AF-activity improves the clinical outcome in a wide variety of diseases in which inflammation and/or secretory imbalances are the essential part of the pathophysiology. In humans SPC is recommended for patients with diseases like IBD, Menieré and mastitis. In other species, SPC is mainly given in order to reduce the risk of diarrhea and in horse also to improve recovery and water balance after hard exercise. More than 50 scientific articles about protein AF have been published (<https://as-faktor.se/en/documentation/>). The collaboration between Lantmännen and Gothenburgh University was initiated when antibiotic growth promoters were banned in Sweden in 1986. The objective was to decrease the risk of post weaning diarrhea by inducing protein AF with feed components.

The use of SPC in weaning diets

It was early demonstrated (Lange et al., 1993) that the concentration of AF in blood plasma from pigs with post weaning diarrhea was 3-4 times lower compared to plasma from healthy weaners. Additionally it was shown that AF in plasma significantly decreases the days after weaning and then successively increase. Some early experiments failed to demonstrate the effect of SPC on health and performance in weaner pigs. Later an ELISA method for analyzing AF was developed (Johansson et al., 2009) which enabled more frequent analyses and possibilities to improve the SPC wheat production process. The currently used SPC wheat induces protein AF very efficiently. After 3 weeks of feeding with 5% SPC wheat in a weaning diet plasma AF increased highly significantly (Johansson et al., unpubl.) Ulgheri et al. (2010) reported a statistically improved weight gain and feed conversion after weaning with 6% SPC wheat in the diet. Currently the concept is commercially used in creep feeds and prestarters without zincoxide.

Discussion

There is a big individual variation in piglets' AF status at weaning. This mainly depends on the status of the sow and the amount of AF transferred to the offspring via the milk. A few days after weaning the piglets start to produce AF of their own. Introducing SPC in diets before and during weaning will increase the piglets' AF status and reduce the risk of diarrhea.

References

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