

# Novel High Quality Protein for Non Medicated Weaner Pig Diets Supporting Gut Function, Growth and Economy

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## Background and objectives

Medicated diets around piglet weaning (antibiotics or ZnO) have been used to control diarrhea post weaning. Awareness on problems with resistant bacteria influencing on public health and a legislation on more restrictive use of therapeutic antibiotics and ZnO urge for feed solutions to overcome the frequent problems with post weaning diarrhea on practical pig farms.

In this context TripleA produces a new protein concentrate based on a patent [1] developed at the University of Copenhagen. The AX3 vegetable protein series combines high protein digestibility with gut health supporting characteristics such as intrinsic low pH= 4 and low Acid Binding Capacity at pH 3 (ABC-3). These characteristics are a main tool to design a **compound feed solution** aiming at minimizing post weaning diarrhea and starting the high growth potential in modern pig genetics. Especially, feed intake and the quality of milk equivalent ingredients in the very first diets to maintain gut integrity around weaning is important [2, 3, 4]. The objective of the present feeding trial [5] was to demonstrate that high quality, non-medicated start feeds can combine a gentle weaning, strong gut development and high growth while quickly changing to straight forward cereal – soybean meal diets allowing to maintain farm profitability.

## Material and methods

A total of 3163 Danish LYxDu piglets, conventional health status, weaned at 4 wks with an average initial body weight of 6,27 kg were randomly allotted to nursery pens, immediately starting the feeding test. Piglets were fed a 3 phase feeding concept either with 67% Fishmeal + 33% Soy Protein Conc. mix (FMx, control) or AX3Digest® (test). Each diet was based on wheat/ barley and FMx or AX3Digest® with inclusion rates of 16.5% in Diet 1: 6-10 kg, 20.4% CP; 9% in Diet 2: 10-16 kg, 19.1% CP; 0% in diet 3: 16-30 kg, 19% CP. From 16-30 kg all piglet received the same diet 3 with soy bean meal as sole protein raw material. None of the diets contained antibiotics or therapeutic levels of veterinary ZnO. Diets 1-3 were produced and formulated iso-caloric and iso-N following the Danish feeding standards for piglets. All statistical analyses of animal performance data ie. feed intake (FI), average daily gain (ADG) and feed conversion (FCR) were analysed by the GLM procedure of R, Gaussian mixed effect model [6] through the Danish Technological Institute, Aarhus, DK.

## Results (reported as LSM)

Calculated dietary and analysed content of crude nutrients, minerals and amino acids corresponded [7]. Piglets fed AX3Digest® diet 2 (10-16 kg) achieved significant better ADG (587 vs 554 g/d; P= 0.008) and FCR (1.38 vs 1.43 kg/kg; P<0.001) compared to the FMx diet. For the overall 43 days test AX3Digest® fed piglets maintained a significant improved FCR (1.44 vs 1.48 kg/kg; P=0.007) in comparison to piglets fed FMx based diets. No diarrhea was observed in the trial period.

## Conclusion and discussion

Four factors are key for complete protein pre-digestion in the infant piglet stomach for maximal growth. A: Sufficient creep feed intake around weaning to improve low stomach hydrochloric acid production, B: stomach pH < 3,5 to ensure maximum pepsin activity, C: very high digestibility of raw materials with minimum acid binding for complete pepsin digestion of feed proteins D: no ANF from ingredients compromising gut wall integrity and thereby protein digestion and absorptive capacity [2, 8, 9]. These characteristics [10, 11] are provided by AX3Digest® compared to the FMx or other ingredients like ZnO with pH= 4 vs 7 vs 8.3; ABC-3= 322 vs 1293 vs 17908 enhancing protein digestion, gut function and subsequently efficient growth. Although diets contained normal protein levels, no diarrhea was observed in any piglets. AX3Digest® fed pigs grew almost 100 g/ d more compared to the DK 2017 country average [12] (541 vs 453 g/d) most of the piglets still receiving veterinary ZnO. Further, the test revealed that feeding cost were equal when AX3Digest® cost 98% of the price of super prime Danish FM. As AX3Digest® fed piglets also consumed overall less feed (1.44 vs 1.48 kg/kg) and gained 0,8 kg heavier piglets at exit of nursery producers improved profitability at least 1.20 €/ piglet [5]. In conclusion, the feeding test demonstrated that a novel ingredient combining high available protein, low pH, low ABC-3 and low ANF included in non-medicated starter piglet diets significantly improved performance being a promising tool in a feed solution for a good weaning process.

## References

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