

# Phytogenics: successful AGP replacement in swine diets

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In 1928, Alexander Fleming made an important observation of antibiosis against bacteria by a *Penicillium* fungus. Prior to this discovery, treatments for infections were based primarily on traditional medicine.

The first commercially available antibiotic was developed in the following decade and the growth-promoting properties of such antimicrobial agents were discovered in the late 1940s.

After that, the practice of feeding sub-therapeutic doses was very successfully adopted and became routine in livestock diets, in spite of Fleming's extensive speeches on the dangers of using antibiotics at low concentrations or during short periods of time.

The Swann Report published in 1968 further drew attention to the risk of bacterial resistance to certain antibiotics and led to a reappraisal of the use of antibacterial agents in animal feeds. Sweden was the first country in Europe to ban the sub-therapeutic use of antibiotic growth promoters (AGP), in 1986. In 1997, the European Union (EU) banned avoparcin. One year later, the Netherlands banned the use of

olaquinox and Denmark took the same action as Sweden, thus banning the sub-therapeutic in-feed use of AGP. Switzerland followed the complete ban of AGP in 1999 which only became effective in the EU in 2006.

In 2009 the World Health Organization (WHO) named antibiotic resistance as one of the three greatest threats to human health, and in 2011 the focus of the World Health Day was 'Combating Antibiotic Resistance'.

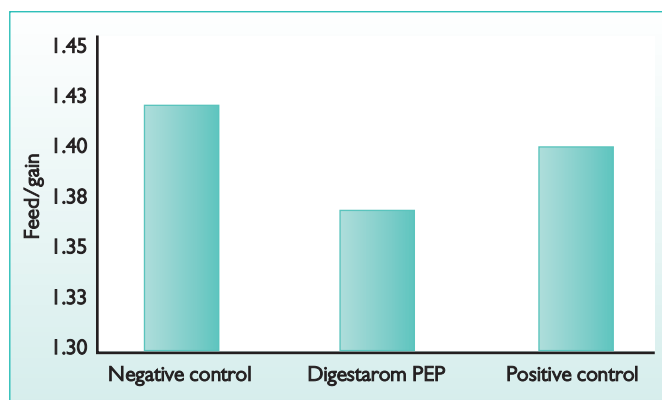
While scientists continue their research on the actual impact of the extensive use of AGP in animal feeds on microbial resistance in humans, consumers are becoming increasingly aware of the negative effects of the so-called superbugs (bacteria highly resistant to antibiotics).

Tendentially, they will demand for AGP-free products. What are the alternatives?

## Phytogenics

It is about time to revisit the potential of substances used in traditional medicine. With the technology currently available, it is possible to use these products more effectively and to better understand their mode of action.

First written records of the use of



**Fig. 2. Results of the trial conducted at Kansas State University. Some 144 piglets (22 days old) with an average body weight of 5.85kg were divided into three treatment groups (eight replications per treatment, six pigs per replication): Negative control, Digestarom PEP 125 (125g/t) and positive control (neomycin and oxytetracycline, each at 140g/t).**

plants for medicinal purposes can be traced back to the year 2,600 BC in Mesopotamia.

Plant-derived substances, also known as phytogenics, possess several properties – flavouring, antioxidant, antifungal, antiviral, antibacterial, antidepressant, immunomodulating and physiological, amongst others, all of which are important for their performance-enhancing effects in animals.

Digestarom comprises high quality herbs, spices and essential oils in standardised formulations that are optimised according to species and growth stages which work together to increase digestibility, reduce intestinal inflammatory processes and stabilise intestinal health.

## A good start for sows

Many factors can influence the feed intake of sows during lactation. The fact is that deficient feed intake during the lactation period results in sows losing excessive body weight, a decrease in milk production resulting in poor litter weight gain and a prolongation of the weaning-to-oestrus interval, with obvious negative effects on sow fertility.

Heat stress is also known to further reduce the feed intake of lactating sows.

In a trial conducted at Texas A&M University (Texas, USA), supplementation of Digestarom in the diets of sows increased feed intake by 14.8% in comparison with control animals (Fig. 1).

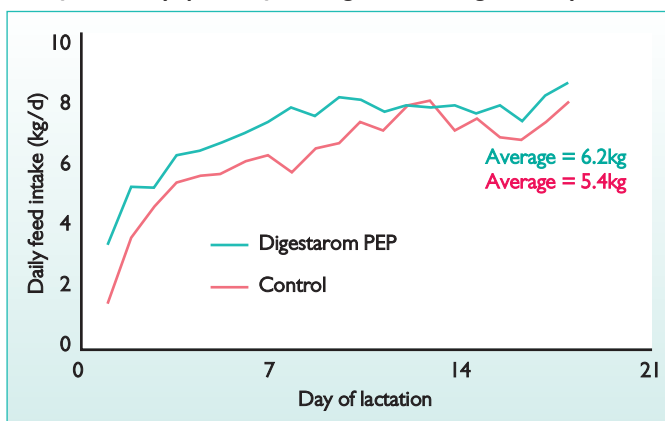
As a consequence, piglets from supplemented sows presented a 10.2% higher weaning weight and their growth rate was increased in comparison with control animals. Moreover, supplemented sows lost 6.1kg less body weight compared with non-supplemented sows (7.2kg vs. 13.3kg), thus maintaining the animals in a better body condition for a faster resumption of reproductive activities. Besides a number of other scientific and field trials which confirm results presented above but in different environments, a trial performed in Germany also showed similar results together with a 39% reduction of piglet pre-weaning mortality in the Digestarom supplemented group (9.5% vs. 15.5%).

## Piglet performance

Piglets undergo a great deal of stress at weaning. This is related to several factors of which changes from a liquid diet to solid feed, separation from the sow and relocation/regrouping are of main importance.

*Continued on page 8*

**Fig. 1. Results of trial conducted at Texas A&M University where 47 crossbred sows were randomly divided into a control and trial groups. The trial group was supplemented with 2kg/t of Digestarom PEP 1000 from 10 days prior to farrowing until weaning at 21 days.**



Continued from page 7

Such changes in their physical, hygienic and social environment reduces feed intake and has a major impact on intestinal health and function. Furthermore, early life stress is increasingly recognised as an important risk factor in the development and onset of chronic intestinal disease.

The potential of Digestarom as an AGP-replacer has been shown in several trials. In Kansas State University (USA), the average daily gain of piglets significantly improved ( $P < 0.05$ ) against a negative control

group. Likewise, daily feed intake also increased numerically. As a result, FCR was better for phyto-genics-supplemented animals and statistically lower ( $P < 0.001$ ) than both the negative control and the AGP-supplemented group (Fig. 2).

### Finishing pigs

Increased weight gain along with reduced feed consumption reveals better feed utilisation by the animal. The Digestarom mode of action has been comprehensively studied and is

proven to reduce nutrient competition by reducing microbial pressure in the gut. On one hand, this was shown to improve digestibility of nutrients and on the other, to reduce the amount of intestinal bacterial breakdown products, such as ammonia and biogenic amines.

Ammonia is also produced by the fermentation of swine manure. It is the most common poison in the swine-rearing environment and a major problem for both the animals as well as the animal caretakers within the facilities.

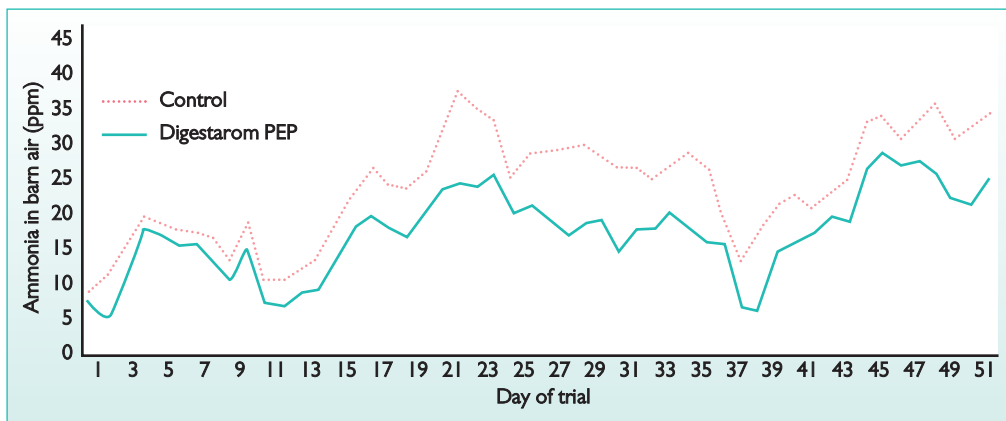
Besides greatly affecting animal

health by causing cough, eye, mouth and nose irritation and leading to poor weight gain and feed intake in pigs, it has a huge environmental and health impact in the vicinity surrounding farms.

The effects of Digestarom supplementation in finishing pigs have been ascertained in several trials.

Reduction of ammonia and odour emissions, by 24 and 29%, respectively, was achieved after supplementation with the phyto-genic product (Fig. 3). Unsurprisingly, this was accompanied by an improvement in total weight gain by 3.4% (897.4 vs. 867.7kg for the whole group) and an improvement in FCR of 4.3% (2.46 vs. 2.57).

**Fig. 3. Results of the trial conducted at HBFLA Gumpenstein, Austria. 32 piglets (initial body weight of 30kg) were divided into two treatment groups (eight pigs per pen, two pens per treatment) as follows: Control group and Digestarom PEP. MGE at 150glt in grower diet and 100glt in finisher diet.**



### From breeding to finish

Sky-rocketing feedstuff prices and highly demanding customers pit swine producers against new challenges: how to make feeds more efficient and above all, how to do it without antibiotic growth promoters. Biomin's Digestarom, a blend of plant-derived substances, is certainly an alternative that will bring success to swine producers in a cost-efficient manner, from breeding to finish. ■

References are available from the author upon request.