

# Why it makes sense use phytogenic feed additives in pigs

**S**ustainability. The keyword and, simultaneously, the challenge of our time. However, even if this is the first thought that comes to mind, this term does not refer solely to our environment, which is worthy of protection. Sustainable development focuses on economic, social, and ecological goals in the present and the future. This also concerns pig farmers all over the world.

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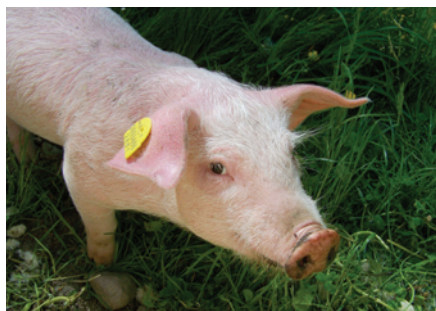
But how do pig producers manage to deal responsibly with finite resources so that present and future generations can live according to their needs, both from a global point of view and regarding the individual farmer's production?

## Sustainable development

Agriculture, with its livestock production sector providing animal-derived food, is critical regarding sustainability. Ensuring high-quality food in the long term will also be a key objective in feeding the world in the future.

At the same time, preserving natural resources and reducing undesired and harmful gas emissions that arise with animal husbandry should be targeted.

Like all other sectors of the economy,



sustainability also concerns pig farming. At the same time, this sector must be economically viable to remain attractive and internationally competitive for future generations.

## Flavour of success

The question is, how are we going to do all this justice – operate economically, yet also generationally and environmentally friendly?

Although it may sound paradoxical - even if natural resources risk being limited, the answer to this question comes exactly from mother nature herself.

Using standardised, specific, science-based combinations of bioactive compounds found in plants – phytogenics – seems to have a promising future in animal nutrition.

Specific combinations of bio-actives have proven efficacy and sustainability.

They can positively impact the animal's efficient usage of the available resources, like enhancing nutrient digestibility and performance, supporting resilience, and, at the same time, potentially contributing to minimising the noxious and greenhouse gas emissions from livestock.

## The goal: maximum feed efficiency

Improved nutrient digestibility is the key to increasing animal performance and a valuable strategy for reducing overall feed costs.

Many compounds in well-formulated phytogenic feed additives (PFA) are highly efficient in stimulating digestive enzymes and facilitating nutrient uptake in the gastrointestinal tract.

They can improve the feed conversion ratio, which means that the animal can perform the same with less feed or perform better with the same feed quantity.

Whatever the approach, the result is always the same. In the case of pigs, the less feed (resources) are needed per kg of weight gain for the pig.

## Reducing feed costs

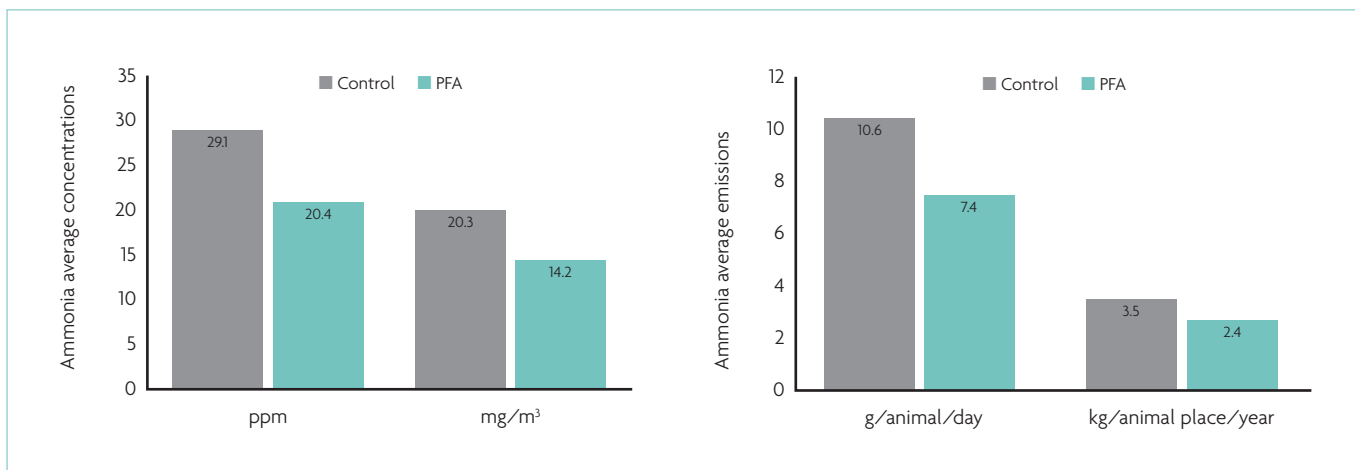
In economic sustainability challenging times, for example, when diet ingredient prices are high, impacting feed price directly, causing cash flow and even profitability losses to producers, vital measures should be taken.

If the nutrient digestibility enhancements promoted by the PFA are transposed to nutrient matrix values (Performizer solution) and applied on least-cost feed optimisation (formulation), immediate saving on feed costs are produced while maintaining consistent animal performance.

Optimising nutrient utilisation comes with a reduction of the amount of resources used, contributing to responsible land and water use, including soil health status.

All these benefits can translate into more profitability and economic sustainability in animal husbandry.

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**Fig. 1. Ammonia emissions comparing PFA (Aromex Pro) with the control (Delacon).**

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### The ammonia dilemma

The earth's capacity to absorb pollutants and harmful emissions is limited. There is no time to lose, as agriculture is the third most significant contributor to greenhouse gas emissions.

Ammonia (NH<sub>3</sub>) is one of the leading emission gases from livestock production, next to carbon dioxide (CO<sub>2</sub>) and methane (CH<sub>4</sub>).

When the aerial concentration of ammonia increases indoors, the animals and workers are affected. Ammonia is a colourless gas with a pungent smell, potentially toxic, corrosive, and irritant.

Frequent exposure to ammonia causes irritation and damage in the respiratory tract mucosa, increasing susceptibility to diseases and decreasing animal performance and welfare.

Surroundings of extensive livestock facilities can be exceptionally high in emitting ammonia.

When released into the atmosphere, NH<sub>3</sub> is converted to ammonium and ammonium salts, significantly impairing terrestrial and aquatic ecosystems through acidification and eutrophication (nutrient enrichment), possibly even leading to changes in biodiversity.

Ammonia and ammonium are also significant precursors for forming particulate matter (PM, a standard proxy indicator for air pollution), affecting human and animal health by triggering inflammation and stress in cells.

Though the dust particles themselves pose a health risk, depending on their size, they can deeply enter the respiratory tract, even affecting the pulmonary tissues and consequently enter the blood or lymphatic system.

Air pollution (both household and ambient air pollution) is responsible for many deaths, and caused 6.7 million deaths in 2019 globally.

Fortunately, there are already known

strategies to minimise ammonia formation and emissions.

Those range from buildings and slurry pits design, ventilation, air-washing systems, and slurry management to nutritional manipulations and additives provided via the feed, such as phytogenics that can potentially have a meaningful and beneficial effect in this sense.

### Tapping into the knowledge of nature

The reduction of ammonia emissions by using phytogenic feed additives may be achieved by several effects, such as increased protein digestibility, resulting in less protein available in the large intestine and higher protein body retention (improved nitrogen balance).

However, some phytogenic compounds also show additional beneficial effects, like the direct binding of ammonia and inhibition of urease activity.

### Acting at the farm level

The growing and fattening (G/F) periods are the most critical in high ammonia emissions in pig production.

Acting at the farm level – thus at the emission source – is an excellent way to contribute to ammonia emission reduction to the atmosphere, improving animals' and workers' welfare while reducing lost performance and production costs.

To evaluate the impact of the incorporation of a well-formulated PFA in pigs' diets (growing and finishing phases) on the ammonia emissions produced under commercial farm housing conditions, a field trial was conducted in the Netherlands.

According to the applicable 'Ammonia and Livestock Farming Regulations (Rav)' in the Netherlands, yearly ammonia emission factors are established for and per type of livestock housing structure.

The farm's established NH<sub>3</sub> emission factor

was 3kg/animal place/year. In this trial, the in-loco-measured ammonia emissions of the control group animals were closely approached with the officially established factors, indicating that the ammonia measurements were representative and could be considered reliable for the housing systems in question.

Results showed (see Fig. 1) an average reduction in ammonia emissions of 30%, both as aerial concentration (ppm and mg/m<sup>3</sup>) and as emission – quantity per animal or even per animal place – generated by Aromex Pro fed animals, compared to the control group.

This study showed that Aromex Pro could potentially be a reliable and effective solution to minimise ammonia emissions at the farm level and under commercial pig housing conditions.

Adding Aromex Pro to G/F pigs' diets can contribute to environmental sustainability and animal welfare by minimising ammonia emissions.

### Give nature a chance

Well-formulated phytogenic solutions can potentially contribute to the challenges facing the pig sector while supporting the whole agricultural value chain in becoming more sustainable. This means saving resources and nutrients and minimising emissions without losing economic perspective.

In the long run and regarding future generations, both globally and for the individual pig farm, we were giving these small but precious bio-actives from the plant universe a chance to pay off.

There is no doubt that sustainability requires certain efforts, but at the end of the day, it brings significant returns, both environmental and economic. Is that not what we are targeting? ■

References are available from the authors upon request