Phytogenic feed additives – advancements in technology

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t has been more than 20 years since the specialist manufacturer Micro-Plus first began research on phytogenic materials (derived from plants) and their effects on animal species.

The goal was to create a new kind of flavour which as well as enhancing palatability of the feed optimised digestion by using the digestibility enhancing properties of selected spices.

The knowledge at that time came mainly from research and publications of the effects on human nutrition and health but it was recognised that there would also be an effect on animal performance.

Of course, 20 years ago the use of antibiotic growth promoters (AGPs) in animal nutrition was the norm and the general perception was that it would not be possible to attain the same levels of performance without the prophylactic use of antibiotics. However, we now recognise that their use was in many situations counter productive.

Backed by research

There are now numerous branded phytogenic feed additives in use around the world. The leading products, such as digestarom from Micro-Plus, are supported by more detailed researched than the traditional AGPs and have been proven to have a wide range of positive effects.

Recent work, including various university and government funded trials, has also demonstrated the effect of phytogenic feed additives but this work has generally been carried out on single plants alone.

The highly sophisticated composition of leading products such as digestarom is the intellectual property of the developers. This know-how is the result of years of experience and many costly trials.

There have been more than 300 scientific trials conducted around the world with the product range digestarom, including research on immune system response and the effect on metabolism by improvement of the precaecal digestibility of nutrients. The effectiveness of phytogenic feed additives is often underestimated and their mode of action misunderstood even by the companies offering such products. It is often thought that the mode of action is antimicrobial and indeed many plant extracts do have such properties.

However, to have an antimicrobial effect in order to, for example, influence intestinal health would require much higher dose rates than are normally used and levels that would negatively impact feed intake.

For example, the antimicrobial properties of oregano (carvacrol and thymol) in-vitro are well documented but these essential oils are rapidly absorbed in the stomach and have a much reduced antimicrobial effect invivo.

However, research on ginger (Zingiber officinale) has shown that zingerone, the principal organic compound responsible for giving ginger its pungent taste, binds the E. coli toxins on the intestinal wall and stops the cascade of biochemical reactions which under normal circumstances leads to diarrhoea. A trial on broilers conducted at the Georg-August-University, Göttingen, Germany, showed the effect of digestarom on the micro-flora in the gut reducing the level of E. coli in the small intestine and in the caeca.

Understanding plants

It is also important to understand the nature of the plants used in phytogenic additives and quality control the ingredients accordingly. For example, the composition of the essential oils found in dill (Anethum graveolens) depend on the time of harvest.

Early harvested plants will have an essential oil with a high content of α -Phellandrene (also one of the main constituents of eucalyptus oil). However, later harvested plants, after the development of fruit and seeds, have a higher content of a different essential oil, carvone. These two essential oils have very different properties.

These examples illustrate the importance of selecting the right ingredients and the knowledge needed to develop successful products that suit the needs of feed markets



today. Micro-Plus has worked for years to standardise the digestarom range to produce highly consistent results.

More than two decades of research lie behind their understanding of the best possible combination of ingredients and the optimal dosage.

Digestarom is now a highly sophisticated range of phytogenic products containing 40 to 80+ different ingredients often representing a couple of hundred single active components.

The company continues to invest in research and development of the digestarom range in order to differentiate their products and to provide bio-statistical data to their customers.

As well as zootechnical data, research has been done and results are available on the following:

Intestinal health and diarrhoea.

• Modification of the intestinal flora (lacto-bacilli).

- Availability of essential amino acids.
- Mortality and morbidity.
- Meat quality (lean meat/abdominal fat).
- Research on the sensory quality of meat (succulence and tenderness).

No other group of feed additives can provide such a comprehensive range of activities and has the potential to give such a high return. Digestarom is a very cost effective solution and can also be combined successfully with acids or enzymes.

There is no doubt that digestarom should be a part of every modern feed concept.

References are available from the authors on request