

Phytoadjuvants – key for enhanced pig productivity

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The history of the human race has been marked by the quest for a healthy life and for the preservation of health. Traditionally, man has depended upon natural resources to stay healthy, whether they are herbs, plants, minerals or substances derived from animals. These natural remedies have been applied to both humans and animals.

During this voyage, man became aware of the existence of various molecules which could provide answers to various health related problems. The major breakthrough was achieved when Louis Pasteur first isolated the infective particle which caused disease. This eventually led to the invention of the chemotherapeutic agent, which could be described as one of the most significant achievements in modern health care.

The primary objective of conventional systems of health care has been the elimination of cause and effect, so as to make the individual disease free. However, this approach did not address the larger issue of health, a state, wherein, the mind, body and soul are in perfect harmony with diet and the external environment.

Fortunately, we have been blessed with a cornucopia of herbs, leaves, roots and shrubs, whose medicinal properties were

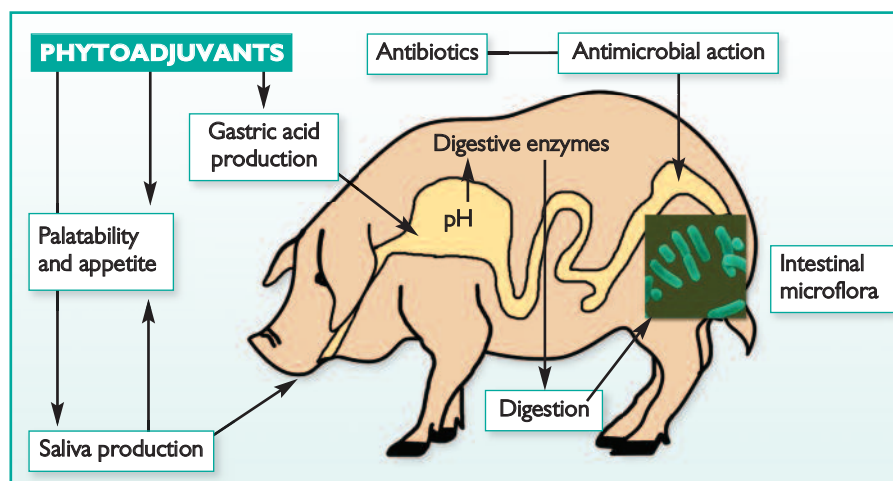


Fig. 1. The routes by which phytoadjuvants help digestion in the pig.

discovered and developed by our ancestors. This branch of knowledge goes way beyond the eradication of disease, after the disease has manifested itself. This is the ideal path that leads to optimum production and yields, without disturbing the balance of nature.

Chemically, herbs reveal a great variety of different chemical substances and have a variety of biological effects. The active components of herbs can be found in many medicines – traditional and modern. In herbs it is mainly the essential oils that are used. Essential oils are extracted from plants by distillation and represent the most con-

centrated form of the biologically active, volatile substances contained in plants.

The use of phytoadjuvants in animal feed first arose when the majority of antibiotic growth promoters (AGPs) were banned from use in animal feed.

As a result, there was a need to find alternative products. It is probably for this reason that phytoadjuvants are often compared with antibiotic growth promoters.

Mode of action

Phytoadjuvants as feed additives have a very diverse mechanism of action from that of AGPs. The mode of action of AGPs is mainly related to their antimicrobial effects against specific pathogenic bacteria in the gastrointestinal tract of the animal.

The generalised mode of action of phytoadjuvants, on the other hand, results from their natural origins. As already mentioned above, herbs contain a great variety of different substances with a variety of effects and thus their mode of action is complex.

In this way, phytoadjuvants have evolved protective mechanisms against many factors that can potentially intimidate their existence, giving them a greater chance of endurance in nature. Thus, the role of the essential oils produced in phytoadjuvants

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Table 1. Phytoadjuvants reduce farrowing stress in sows: Control Group A control comprised two pregnant sows. Group B, comprising eight pregnant sows, was supplemented with Phytoadjuvants for 10 days (five days prior to farrowing and five days after parturition).

Groups	Glucose (MEAN ± SE)		
	5 days before	5 days after farrowing	
Group A (mg/dl)	93.55 ± 5.02	86.73 ± 6.76	
Group B (mg/dl)	95.45 ± 4.06	93 ± 3.2	
Restobal supplementation resulted in restoration of blood glucose level after farrowing stress.			
Groups	Haemoglobin (MEAN ± SE)		
	5 days before farrowing	5 days after farrowing	30th day of farrowing
Group A (gm %)	11.73 ± 0.312	11.53 ± 0.348	13.5 ± 1.28
Group B (gm %)	10.3 ± 0.3*	10.9 ± 0.50	11.5 ± 0.702*
Hb level is normal (absence of haemoconcentration due to farrowing stress) in the treated group as compared to control.			

Parameters	Treated	Control
No. of sows	52	52
No. of sows affected with hypogalactia	2 (3.80%)	6 (11.50%)
Average weaning weight (kg)	7.5	6.8
Piglets affected with diarrhoea (%)	5.4	7.8
Piglet mortality (%)	6.7	11.8

Table 2. Supplementation of phytoadjuvants reduces the incidence of hypogalactia in sows and diarrhoea in piglets.

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additives includes a combination of effects that protect them against pathogens and fungi.

The major problem encountered with AGPs is not only that they encourage antibiotic resistance in pathogenic bacteria, but they also directly affect the beneficial microflora population. By inhibiting the growth of specific bacteria, they simultaneously make a path for other potentially pathogenic bacteria on which they have no effect. Therefore, it makes more sense to support the animal's own defence system, which is adapted to protect the animal against a number of pathogens.

Their mode of action is based on a more holistic approach, which can support the animal's endogenous defence mechanisms, and thus can be considered a more sustainable long term solution.

The major advantage of phytoadjuvants is the way they are used in animal feed – they neither pose a risk to the animal nor to the consumer and are accepted fully in any feed regulations.

Support appetite

Due to their mode of action, phytoadjuvants prevent an inappetence related drop in performance. In the pig, lactation in the sow and weaning in the piglet are the critical stages of production. During these phases, incidences of digestive disturbances are quite common.

Impaired digestion thus influences the growth of colonic pathogenic bacteria since more nutrients reach the colon where pathogenic bacteria generally grow.

This can subsequently lead to urinary tract infections as well as MMA syndrome. For suckling pigs this means an increased risk of infection, due to increased secretion of pathogenic bacteria in the faeces of the sow.

In the weaning pig digestive problems and the associated imbalance of the intestinal microflora often lead to drops in performance and in many cases to diarrhoea problems, which can further impair performance.

Support digestion

Phytoadditives have a positive influence on saliva production and the production of gastric acid, thus they not only increase appetite and feed intake in weaners by releasing digestive enzymes, but they also support digestion.

Increasing the secretion of gastric acid in weaners is important, since at that age the secretion of gastric acid has generally not reached its full potential.

Gastric acid acidifies the stomach contents which not only makes the environment conducive for proper action of protein digestive enzyme pepsin but also inhibits the growth of pathogens which have a preference for a higher pH.

Validated and sustainable

The day to day problems like diarrhoea in piglets and MMA syndrome and hypogalactia in sows, can also be kept to a minimum level by the use of herbs and scientific studies along with field use has proved this. In the wake of guidelines restricting the use of antibiotic growth promoters and other chemicals in the production chain, herbs can provide a solution. The herbs with an antimicrobial action can be used for improving digestive functions and better nutrient utilisation. Due to their pro-host action against microbes the risk of resistance emerging is minimal or nil.

Ayurvet has many years of experience in the research and development of phyto-genic feed additives. Its phyto-genic product range is based on the mode of action of high quality extracts. The efficacy of these phyto-genic products has already been proven many times under commercial situations in pig production.

At the independent research institute for pig production in Korea, commercial products are tested on a scientific basis for their efficacy in feeding trials.

The parameters for sows and weaners are the number of sows affected with hypogalactia, average weaning weight, piglets affected with diarrhoea and the percent mortality from which an index for comparison is calculated to evaluate the economic viability of products.

In one such commercial trial, 104 sows were selected on the basis of similar body weight and parity and assigned to two groups. Both groups received conventional diets in a pelleted form. The diet of the trial group was supplemented with a combination of phyto-genic extracts.

The results (see Table 2) show a significantly higher weaning weight of piglets, low diarrhoea and mortality percentage in the treated group.

In the treated group, there was 5% less piglet mortality as compared to the control group. ■