

# Important opportunity to improve piglets health and welfare benefits

A natural nutritional ingredient as an alternative to antimicrobials



#### List of abbreviations

ADG:	Average daily gain
ADFI:	Average daily feed intake
FCR:	Feed conversion ratio
AMGP:	Antimicrobial growth promoter
SDAP:	Spray dried animal plasma
SDPP:	Spray dried porcine plasma
SDBP:	Spray dried bovine plasma

This summary uses the conclusions reported in:  
**Spray dried animal plasma as an alternative to antibiotics in weaning pigs, a review.**

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## Opportunity to improve piglets health and welfare benefits

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A review of available evidence from 20 years of research and experience indicates that spray dried porcine plasma (SDPP) is an excellent alternative to in-feed antimicrobial growth promoters for piglets in the post-weaning phase. Benefits include better welfare and higher productivity by protecting health at vulnerable phases such as weaning.

Animal plasma products, like SDPPs, are safe, natural ingredients for animal feeds and pet foods, rich in essential nutrients such as amino acids, vitamins and minerals. They are also used in food products such as hams and sausages and by the pharmaceuticals industry.

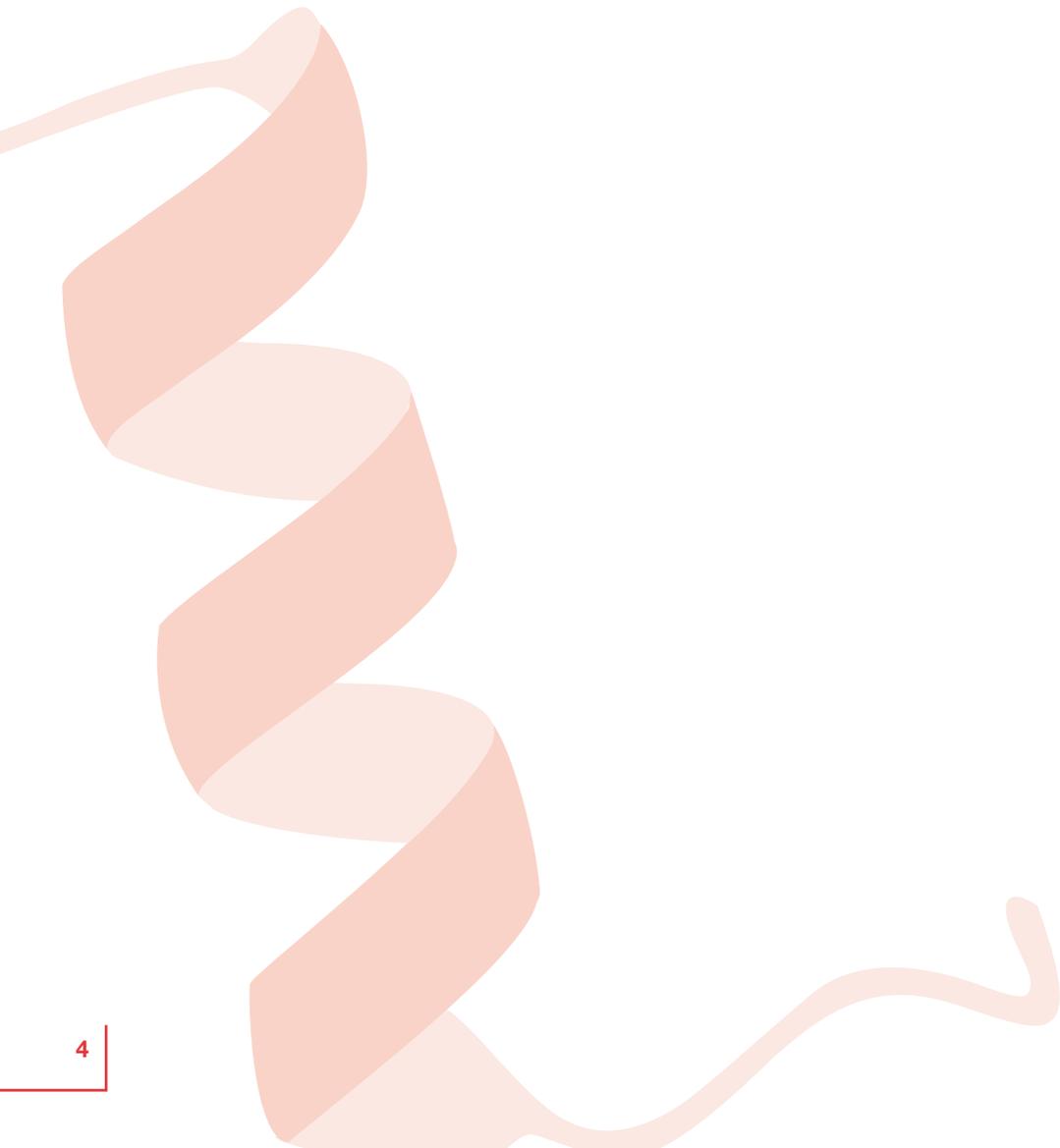
Weaning is when piglets are moved from the sow into a new environment. They change from suckling to eating dry feed from a hopper and drinking water from a drinker. At the same time they mix with pigs from other litters. The piglets often go through a brief period of not eating, which compromises disease resistance and the development of their intestine.

When they start eating again, hungry piglets often eat more feed than they can cope with. The intestine is not yet adapted to produce enzymes for digesting feed of vegetable origin; as opposed to milk from the sow. Undigested feed in the gut and the piglets' reduced resistance to disease can lead to sickness that delays growth and development. Previously these problems were controlled by antibiotics added to feed as growth promoters.

Piglets are particularly vulnerable shortly after weaning. Dietary factors that boost their vigour and resistance to disease will deliver benefits that last throughout their lives. Following the ban on antimicrobial growth promoters in the European Union and other regions, new options are needed to ensure robust health and good animal welfare.

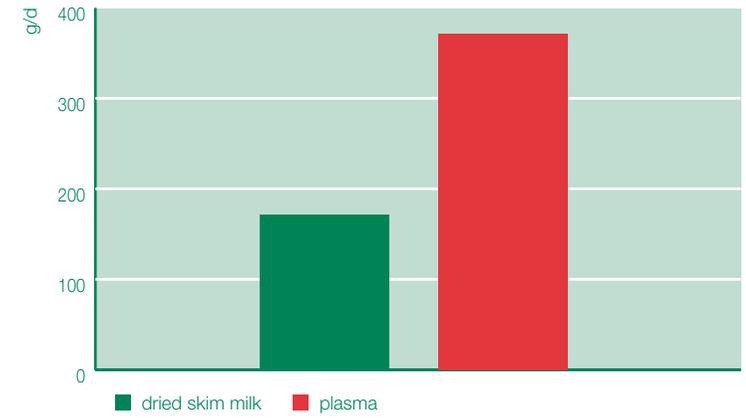
Evidence from 75 trials in 43 publications involving over 12,000 piglets shows that spray dried animal proteins (SDAPs) bring positive responses and plasma from porcine origin (SDPP) is the best, delivering good health and good welfare.

As well as being an effective alternative to antimicrobial growth promoters, SDPP is sustainable and meets all European regulatory requirements.



**Piglets eat more feed when SDPP is added in their diets, even comparing when diets contain milkproducts**

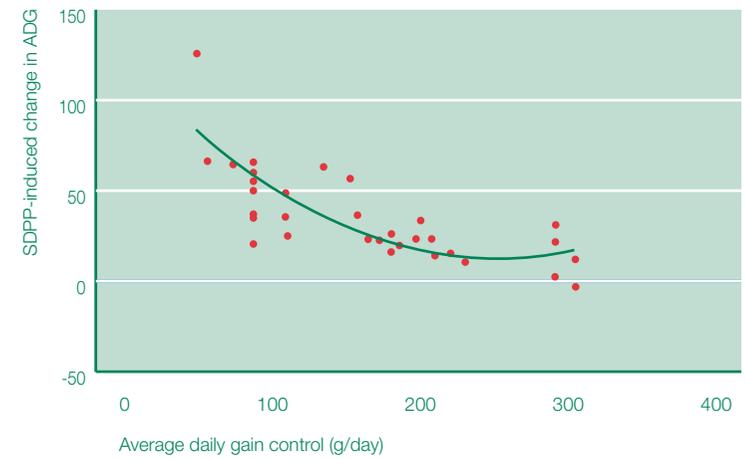
*Piglets prefer SPPP to milk proteins in their diet*



**Plasma protein works when other ingredients fail**

*If the health status of piglets is low (represented by a low daily growth)*

*SDPP has a greater effect*



## Feeds for today's pig farming

Most modern pig farms are highly efficient and are certified to Quality Assurance standards required by major retailers.

The pigs are reared in a series of phases. First the piglets are with the sow, feeding on her milk. That provides optimum nutrition and delivers valuable protective antibodies against diseases. Special solid feeds can be introduced from about seven days of age (so called creep feed).

After three to four weeks, the piglets are weaned and move into piglet groups with solid feed only, while the sow is prepared for the next gestation cycle.

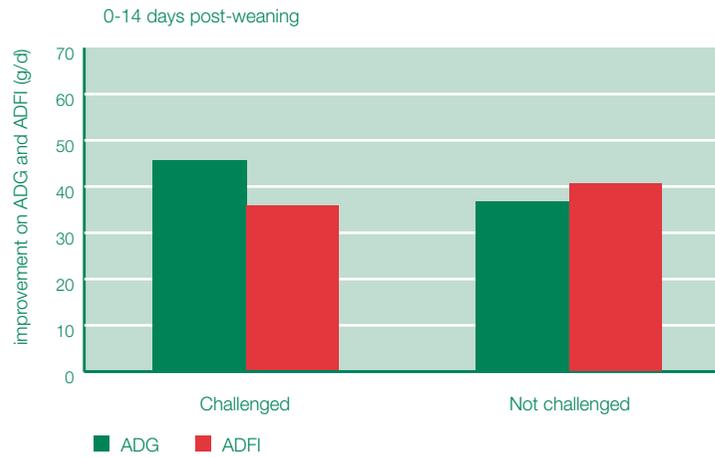
At about two months, when the metabolism is fully adjusted to solid feeds, they move onto grower feeds. By this time the grower pigs have developed their own resistance systems. The final phase is as finishers.

At each phase, the pigs are looked after by livestock specialists and provided with appropriate nutrition. The exact nutritional balance is regularly adjusted by changing ingredients, their proportions and production methods. In this way feed suppliers and farmers can match the needs of the pigs in each phase of their life cycle, to produce uniform batches of pigs that become high quality food.

Increasingly, pig farms operate as closed units. All phases follow strict bio-security rules to protect the pigs from infections and eliminate stress from transport between units. The farms are productive, with low mortality and high welfare standards.

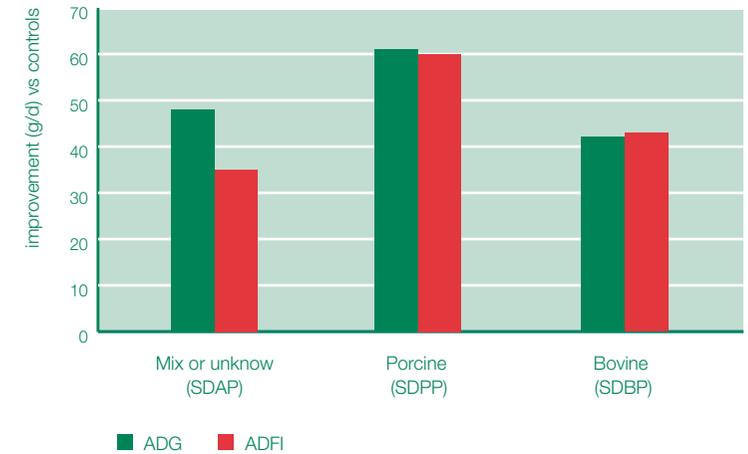
### ADG and ADFI improvement in response to SDAP in pigs under experimental challenge

Benefits from plasma are significantly higher under compromised health conditions. Although not showed in these graphs, it appears that plasma improves feed to gain ratio more markedly when the piglets are exposed to an experimental challenge. This could be indicative of a lower expenditure of energy and nutrients to build an immune response against the challenge



### ADG and ADFI improvement in response to different sources of SDAP

The results indicated that, independently of the origin of plasma (porcine or bovine), in all cases the performance of piglets improved significantly, although it appears that plasma from porcine origin has a higher efficacy than plasma from the other sources



## **Pigs efficiently convert nutrients into high quality food**

Compound pig feeds provide a complete balanced diet through a combination of energy and amino acids and other essential nutrients such as vitamins and minerals.

In producing feeds for pigs and other animal, the feed industry creates an outlet for large volumes of raw materials. The raw materials may be feed grade crops that are not wanted for food production, or food grade crops that are surplus to demand, or by-products of food and drinks processing or, more recently, from biofuel production.

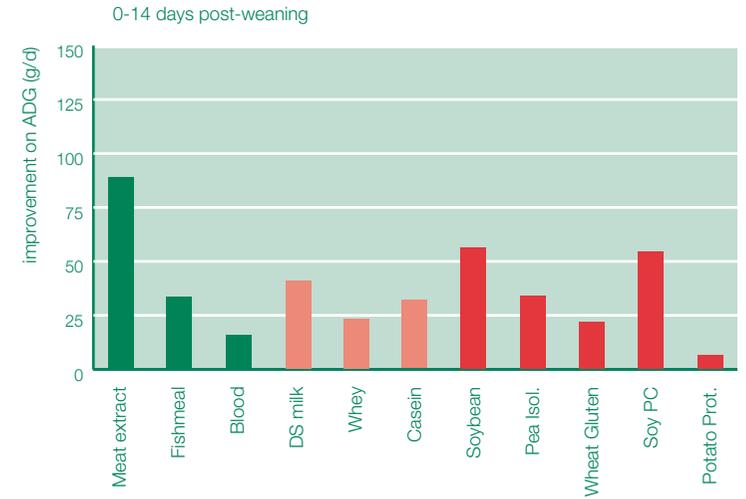
The formulations of animal feeds are flexible — different raw material combinations can give the same nutritional profile. Using what is available, feed and pig producers upgrade otherwise unwanted raw materials into high quality food for human consumption.

Historically, many raw materials were bought without close attention to food safety. Nowadays, all reputable feed producers audit and monitor their suppliers, with extensive analytical programmes to check for unwanted substances. Equally, pig producers and processors that supply retailers, food service and food processors will only purchase feed from reputable companies and require quality certifications to be in place throughout the supply chain.



**ADG improvement in response to SDAP according to the protein source being replaced**

*SDAP replace efficiently all kind of protein sources from animal, milk, or vegetable origin. Replacing these proteins by SDAP the scientific results statistically demonstrated that the piglets grew faster, ate more and used the feed more efficiently indicating that these animals are healthier*



Plasma vs different protein sources

Trials	Protein replaced	Improvement		
		ADG (g/d)	ADFI (g/d)	FCR (kg/kg)
27	Animal origin	33*	22*	-0.10
47	Milk proteins	35*	46*	-0.11
69	Vegetable origin	41*	45*	-0.07

\* P<0.05 statistical significance of improvement versus control diets without plasma

## Better weaner health and welfare

The most vulnerable stage in the pig's development, even on closed units, is at weaning and that is where the proteins in SDPP can make an important difference. The switch to solid feed triggers the change in metabolism and the development of the intestine but piglets usually take around 15 hours to start feeding properly on solid feed and it is some days before their metabolisms and intestines begin to adapt.

Briefly the piglets are without the natural protection found in the sow's milk. Simultaneously, their stomachs are still optimised for digesting milk and not yet acid enough to destroy pathogens that may be ingested. Over-eating often follows the hours of not eating and can lead to bouts of diarrhoea, known as scouring in piglets. This causes additional distress and temporary loss of weight.

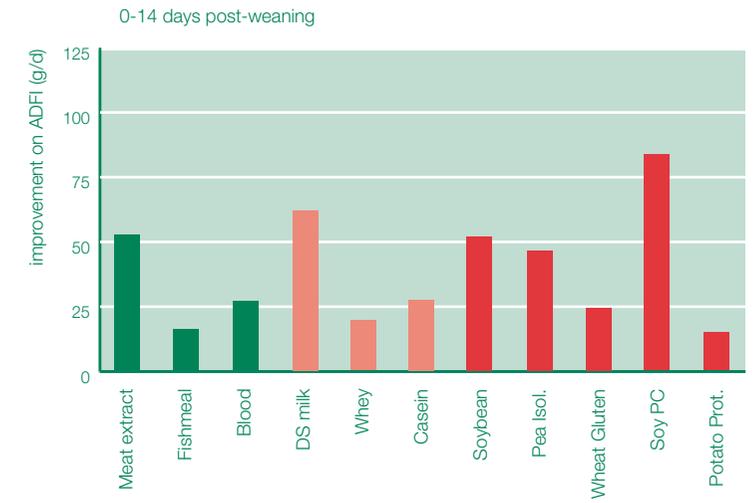
Effective protection in the feed is vital for good welfare and a good start.

Antimicrobial growth promoters delivered protection from infections and scouring but they have been banned in the EU because of concerns that their use in farming leads to the development of antibiotic resistance in bacteria. Bacteria are able to pass resistance between strains and thus the resistance may transfer to human pathogens and compromise our ability to treat bacterial diseases.

It is well known that SDPP offers equivalent protection. Ideally SDPP should be added at 4–8% in the creep feed before weaning and during the two-week prestarter period. After the first two post-weaning weeks and before the piglets move to the grower phase. At that point, the piglets usually take no SDPP as they have fully functioning immune systems and digestive tracts.

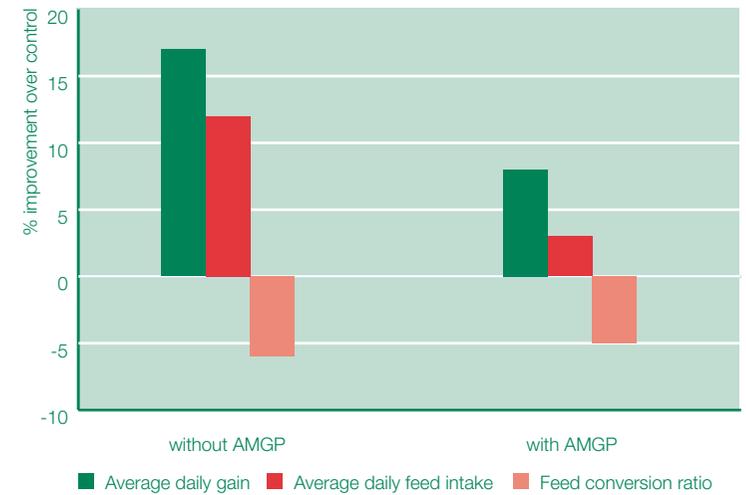


**ADFI improvement in response to SDAP according to the protein source being replaced**



**Plasma in European piglets diets with and without AMGPs**

*The effect of SDPP is greater in feed without AMGPs (growth promoters)*



## A natural, sustainable product with natural properties

Spray dried porcine plasma protein is a sustainable by-product from the meat industry. Plasma proteins are extracted from fresh blood collected at certified slaughterhouses from animals approved for human consumption. The production process is similar to that of fresh milk and dairy products. Valuable components are separated using ultra-hygienic techniques in processing plants to produce high quality, safe, nutritious ingredients.

Plasma is the clear, straw-coloured liquid fraction of blood, after cells and solids have been removed. The plasma is concentrated by vacuum evaporation or filtration then dried by spraying fine droplets into a drying chamber at inlet air temperature around 200 °C. The droplets dry instantly, without denaturing their nutritional value and the elevated temperatures eliminate any risk of microbial or viral contamination. SDPP is of porcine origin, in line with European legislative requirements, and is an excellent way of retaining the value from by-products of the meat processing industry that otherwise have little or no value.

At present in Europe only porcine plasma can be used for piglet feeds. In the rest of the world both porcine and bovine plasma can be used. In Europe, bovine plasma is mainly used for manufacturing companion animal food as well as in food for humans.

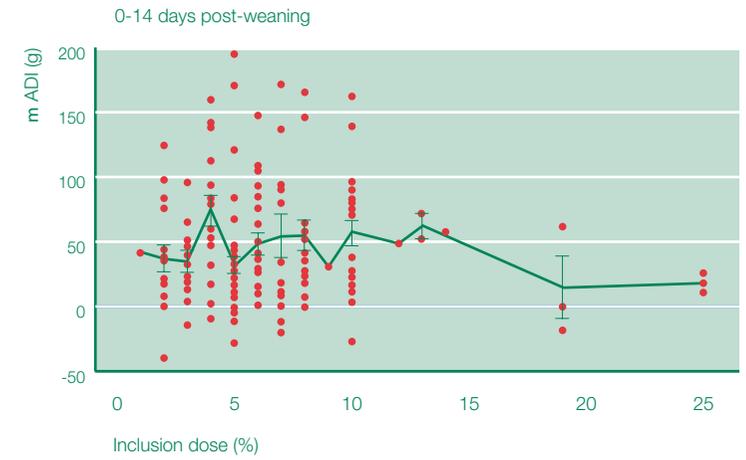
SDPPs are rich with quality proteins, 70–80 percent protein, and provide vitamins and minerals. The amino acid profile of plasma proteins is very close to that of milk protein, which is considered to be the nutritional model.

Ninety-five percent of the protein is albumins and globulins. Albumins are highly nutritious and the globulins include gamma globulins, which have an important function in immunity. These immunoglobulins keep their biological activity throughout the SDPP production process.

### ADG improvement in response to SDAP according to inclusion level



### ADI improvement in response to SDAP according to inclusion level



*Response of piglets to different doses of plasma. The results indicated the improvement on growth and feed intake over the control diets at different inclusion levels of plasma. During the two weeks pre-starter period, an optimal inclusion level of 4 – 8% is suggested*

## Endorsed by research

A large volume of research has been published on the efficacy of SDPP since it was first proposed as a protein source for piglets in the late 1980s.

SDPP appears to be the most effective, especially in the immediate post-weaning period. Even so, the few trials directly comparing both sources of plasma found little difference between them.

SDPP may work better because it continues the natural protection against pig pathogens, delivering the antibodies previously provided in the sow's milk and that protection lasts throughout the weaning period, bringing better health and improved welfare.

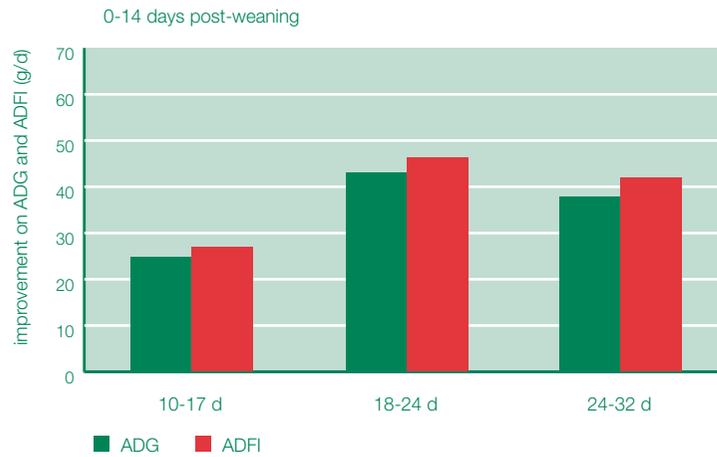
The response of piglets to SDPP is most marked when it replaces meat meal or soya bean meal in the diet. The method used to concentrate the plasma has no significant effect on performance.

SDPP also improves the ratio of feed intake to weight gain more markedly when an infection is present among the piglets, possibly because the protective effect of the immunoglobulins means less energy is needed to fight the infection.

Trials show weaning piglets prefer diets with porcine SDPP. Possibly the palatability increases feed intake and contributes to the improved performances.

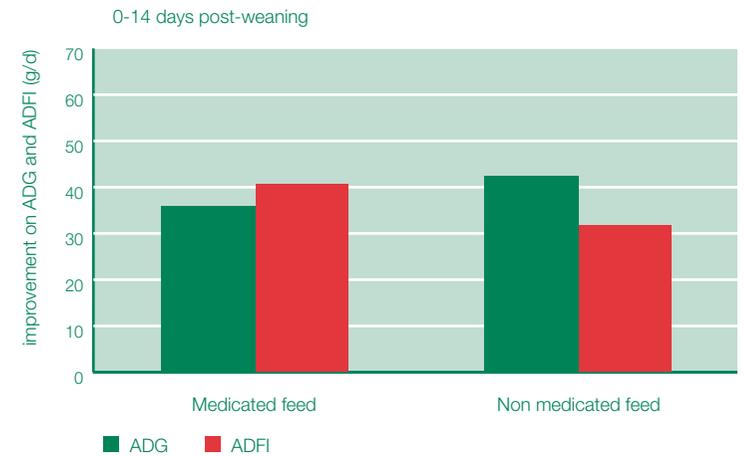
### ADG and ADFI improvement in response to SDAP according to age of weaning

The response on performances to plasma according to the age of the piglets at weaning was studied. The magnitude of the response in the first week post-weaning appears to be more important in the 18 – 24 days group, although no statistically significant differences were observed between groups. However, in the whole prestarter phase (0 – 14 days) the positive response to plasma is similar to all weaning ages



### ADG and ADFI improvement in response to SDAP combined or not with medicated feed

Plasma works, if the feed contains antimicrobials or not. The plasma effect is additive to the effect of the antimicrobial. During the first two weeks post-weaning similar response on growth and feed intake was observed independently if the feed contains or not antimicrobials, indicating that plasma is a good alternative to replace them. Although not indicated, the feed efficiency was statistically improved in both periods compared with the inclusion of antimicrobials



## Safe approved ingredients

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Spray dried plasma products are produced in strictly controlled and hygienic processes that capture the full nutritional value while meeting regulatory specifications to ensure they are pure and safe, and free from pathogenic microbial and viral contamination.

All producers of blood products in Europe are members of the European Animal Protein Association (EAPA). All EAPA members must be certified by external auditors to meet the highest HACCP and ISO, or equivalent, standards.

Blood products such as SDPPs and other SDAPs are permitted as food and feed ingredients in the European Union, in North America and South America and throughout most of the Asia Pacific region. They are approved by all major food safety authorities, including the European Food Safety Authority and the US Food and Drugs Administration and meet the specifications of bodies such as the World Health Organization. Porcine plasma proteins are specifically approved for use in piglet feeds in the EU (Regulation (EC) No 1292/2005).

For further information on the benefits of natural animal proteins in feed please contact EAPA. EAPA represents all European producers, specialized in the production and supply of high quality natural animal proteins.

***EAPA***

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