

A raw material in the feed which ensures the sow feels fit in the maternity pen and optimizes her capacities directly after giving birth. It sounds unreal, but seems possible. Under practical circumstances, there was an improvement in the number of weaned piglets per sow per year due to adding fermented potato protein into sow feed.

Raw material in sow feed should optimize metabolism

Fermented protein for better liver function

Whilst giving birth and during lactation, sows don't have it easy. Eventually, sows do not always perform as well physically and genetically as they could. Through sow feed, in the past years, efforts have been made to facilitate sows during this period. Still sows suffer from certain physical stress which prohibits certain mother behaviors from expressing optimally.

Supplying fermented potato protein to sows can eliminate these problems according to Ardol in Susteren (NL). Adding this raw material to feed, Ardol ensures that the digestive system works optimally. As a result, the sow stays fit and she can optimally wean her piglets. Owner of Ardol, Hubert Gillessen, became known in the livestock farming, among other things, as director of Schils. About ten years ago, one of his companies came into contact with French researchers who examined the properties of the Taxus plant, genus of the yew. They researched this plant in order to develop a vaccination against cancer. Among other things, the yew evidently has an inhibiting effect on cell growth. "We considered that the reverse should also be possible: to find a vegetable extract which stimulates cell growth", says Gillessen.

After research, it was apparent that administering a specifically treated extract to calves had an interesting side effect: the animals ate more and digested the feed better. Gillessen discussed this effect with biologists and professors and they were able to explain this

positive effect. "This specific extract ensures that the production of IGF-1 (Insulin-like Growth Factor 1) in the liver is leveled, which has a positive effect on the functions of the digestive system.

Complex process

The production of IGF-1 is a part of a complex process. The functioning of the body is determined by the production of hormones by several glands. All these glands together form the endocrine system. The produced hormones actuate organs, which in turn ensure that the body functions properly. The pituitary gland has an important role in this process. This is a gland found at the base of the brain, which, among other things, produces Growth Hormone (GH). The pituitary gland is actuated by the hypothalamus, a small gland that continuously monitors the GH level in the blood. The GH produced by the pituitary gland is transported by the blood to the liver. Receptors in the liver, which react to the GH in the blood, instruct the liver to produce IGF-1. IGF-1 is essential for the formation and restoration of muscles, bones and heart functions. Without the combination of GH and IGF-1, strengthening or restoration of the body would not be possible. According to Professor Bas Kemp, Professor Adaptation Physiology at the Wageningen UR; IGF-1 is also known to have a positive effect on the processes that are essential to reproduction. IGF-1 is involved in follicle growth, ovule quality and placental development.

The production of IGF-1 by the liver can be interrupted due to several factors. For example, the immune system is activated because of the detection of a virus

or an infection. Substances are released which inhibit the receptors of the liver, this means that less IGF-1 is produced. A Negative Energy Balance can also inhibit the receptors in the liver.

Desired level

In order for the body to function properly, the IGF-1 must be maintained at a desired level. It is known that people with the Chronic Fatigue Syndrome (CFS), for example, have low levels of IGF-1 in the blood. According to Ardol, research has proven that administering specific vegetable extracts to CFS patients has a positive effect on the IGF-1 level in the blood. The theory behind this is that the extracts ensure that the receptors in the liver are preserved. IGF-1 is produced despite the challenges that the system is faced with. The repairing capacity of the body is thus kept in tact.

The IGF-1 production in sows faces certain pressures. For Ardol it was worth seeing if the administration of a vegetable extract also had a positive effect on pigs. Ardol's veterinarian Rudi Forier carried out several practical trials with production pigs. He used an extract which was obtained from potato protein. This protein is fermented by a specific bacteria culture at DSM, Germany.

Forier extracted blood from the trial pigs before they received the fermented potato protein. During several weeks, the pigs received the extract and blood tests were taken during this period. The blood tests showed that the IGF-1 level in the blood

had increased. Then Forier carried out several preliminary trials with stragglings piglets. He did not look at IGF-1 levels but at visible effects. "After approximately three weeks you could see the animals recover. They ate better and there was an increase in growth", Forier said. Through a colleague veterinarian, Forier started administering topdressing over the sow feed on a Belgian sow farm. The animals received the extract from the moment they were put in the farrowing pen till insemination. "Months later there proved to be even more piglets per sow" Forier claims. Ardol wanted to know what the results would be on several different sow farms with a diversity of cross breeding under practical circumstances.

On a large scale

This is the reason why Ardol was looking for a Dutch company which administratively follows a large amount of sows and could specifically process the product through the feed. The factory owned by Boerenbond Deurne in Helmond (NL) has an installation which can mix raw material in small quantities homogenically. This was the requirement for a proper administration of the fermented potato protein. Director Bert van 't Klooster and Nutritionist Koen Molenaar decide on the basis of the information given by Ardol, the Belgian results and their own trials to process the fermented potato protein in all of their sow feed. The results on the sow farms had to prove that this application actually has a positive effect on the condition of the sows and eventually on the amount of weaned pigs per sow. Bert van 't Klooster realized that he took a risk. "But, we are a co-operation and I believe we owe it to our consumers to continuously seek possibilities that raise performance levels. I was, on the basis of extensive preliminary analysis and

Results practical trials on 60 farms			
	Practical farms	Agrovision	Improvement
Live born/litter			
Jan-Mar 2006	12,5	12,3	
Jan-Mar 2007	12,9	12,5	
Improvement	0,4	0,2	0,2
Fall-out till weaning (%)			
Jan-Mar 2006	13,0	12,9	
Jan-Mar 2007	12,4	13,0	
Difference	-0,6	0,1	-0,7
Weaned/litter			
Jan-Mar 2006	10,8	10,7	
Jan-Mar 2007	11,3	10,9	
Difference	0,5	0,2	0,3
Re-inseminations (%)			
Jan-Mar 2006	7,1	8,0	
Jan-Mar 2007	6,6	8,0	
Difference	-0,5	0	-0,5
Weaned/sow/year			
Jan-Mar 2006	26,2	25,3	
Jan-Mar 2007	27,4	25,7	
Difference	1,2	0,4	0,8

accessible information, convinced that this product could work to raise organ activity levels."

The table shows the results that were taken from 60 sow farms with in total almost 20.000 sows. The period includes the first quarter of 2007. The sows had all received the feed three months prior to the trial. The results are compared to the same period in the previous year and with Agrovision (without the customers of Boerenbond Deurne). In order to get a clear picture of the effect of the fermented potato protein, a correction of the average yearly (genetic) progress has been made.

Statistically difficult to prove

It is not possible to indisputably determine if supplying fermented potato protein has resulted in keeping the IGF-1 levels in the blood at optimal levels. To prove this, blood would have had to be taken from all sows. The results do show that there is a significant improvement in the number of weaned piglets per sow per year: 1.2 piglets compared to last year after a correction of 0.8. The number of live born piglets increased whilst the fall-out during weaning decreased. The number of re-inseminations also decreased. "It is an interesting theory," says Professor Kemp, "particularly due to the involvement of IGF-1 in the reproduction. But, IGF-1 is not the only factor involved in follicle growth, ovule quality and the

placental development. It would be useful to see, if products like these, also do other things besides influence the IGF-1 production."

Moreover, according to Kemp, these trials still remain experiments, because a comparison has been made of sows before and after treatment. "You can hardly

correct differences in time. IGF-1 concentrations in growing animals are dependant on age and food supply and reproduction results can also fluctuate extensively in time. So, even with corrections and with the best intentions, it is difficult to categorically conclude anything based on these results. Scientific experiments place experimental animals next to each other and compare them." For Ardol, these test results offer, due to the large number of sow farms tested, enough evidence to market fermented potato protein under the name LIANOL. It is available to all the mesh manufacturers. Ardol does agree with Kemp that in the future testing should be executed with equal testing groups and to test the groups under similar circumstances. Van 't Klooster from Boerenbond Deurne will continue to process the fermented potato protein in his sow feed. "I believe that the results show, with a few specific vegetable raw materials that you can profit even more from the possibilities that the body naturally offers."