

RESULTS 2019

SEGES DANISH PIG RESEARCH CENTRE

DanBred (also)
stands for sustainability

Success with intact tails

It pays
to follow the standards

DANISH:
Vigorous requirements
pay off



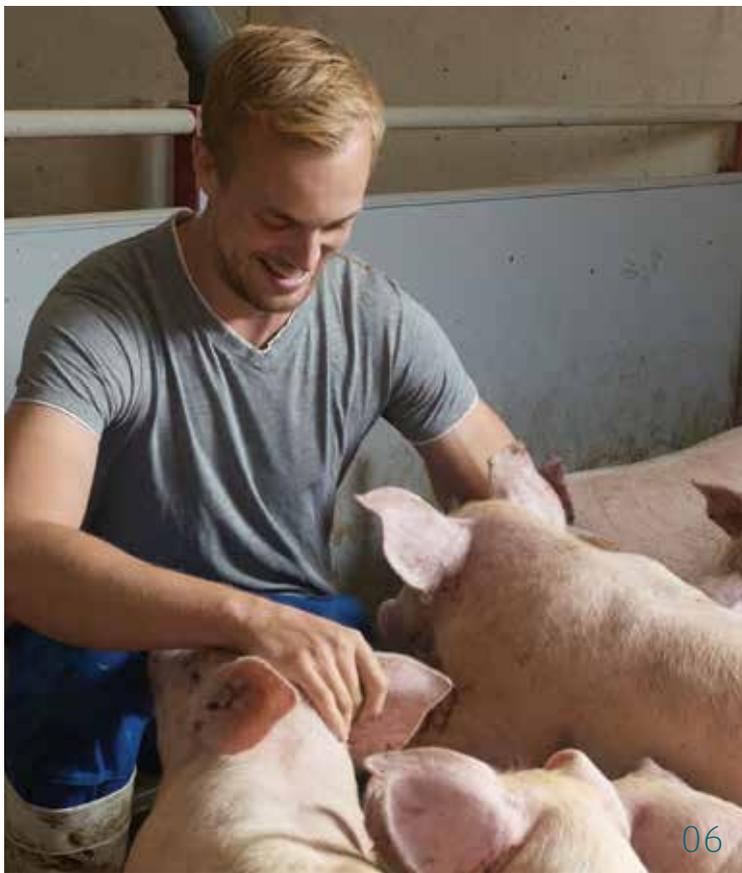
SEGES
Danish Pig Research Centre



Welcome to Results **2019**

Every day, SEGES Danish Pig Research Centre works to ensure better results for you and your bottom line. 2019 was no exception. Our work this year has included improved sets of standards for finishers, young pigs and sows, the further development of a new and less expensive housing unit concept and alternatives to soy meal. A large part of this year's agenda also included our breeding work for DanBred, for which SEGES Danish Pig Research Centre is also responsible.

YOU CAN READ ABOUT ALL THIS AND MUCH MORE IN RESULTS 2019.



06

CONTENTS

- 04 > Knowledge will continue to safeguard Danish pig production
- 06 > Success with intact tails
- 08 > Keeping an eye on feed manufacturers
- 10 > Sows in the right condition perform better
- 12 > Supplementary nutrition: make the right choice
- 14 > New knowledge produces more robust DanBred pigs
- 16 > Vigorous requirements pay off
- 18 > It pays to follow the standards
- 20 > Danish protein for sows is not far away
- 22 > Greater focus on piglet survival rates
- 24 > DanBred (also) stands for sustainability
- 26 > A future without therapeutic zinc oxide
- 28 > New measuring equipment shapes future environmental technology
- 30 > Contingency measures are at hand in an emergency
- 32 > Less expensive finisher units in future
- 34 > Loose-housed sows should be able to look after their own pigs
- 36 > Exciting new projects underway
- 38 > We are where you are



20



12



30



34

FOLLOW US:

-  pigresearchcentre.dk
-  facebook.com/SegesSvineproduktion
-  svin.seges.tv

Svineafgiftsfonden

Thanks to the Pig Levy Fund for supporting a number of our projects



Knowledge will continue to safeguard Danish pig production

SEGES DANISH PIG RESEARCH CENTRE IS DANISH PIG PRODUCTION'S KNOWLEDGE AND DEVELOPMENT DEPARTMENT. THIS IS WHERE EXPERTS IN THEIR FIELD WORK ON WHAT INFLUENCES YOU, YOUR EVERYDAY LIFE AND YOUR BOTTOM LINE.



Danish pig production excels when it comes to quality, animal welfare, traceability and sustainability. This, combined with efficient production, means that we remain competitive despite the high cost levels. We would not be here today were it not for our constant focus on development. This makes it easier to be a pig producer in Denmark, which is precisely what SEGES Danish Pig Research Centre stands for.

PIG PRODUCERS SET THE DIRECTION

The Board of Danish Agriculture & Food Council, Pig Production, approves which activities will receive attention over the coming years. The Board comprises nine pig producers and one adviser.

All new projects are also assessed by an Innovation Council, which comprises forward-thinking pig farmers. It is important that our

research areas provide value for you as a pig producer.

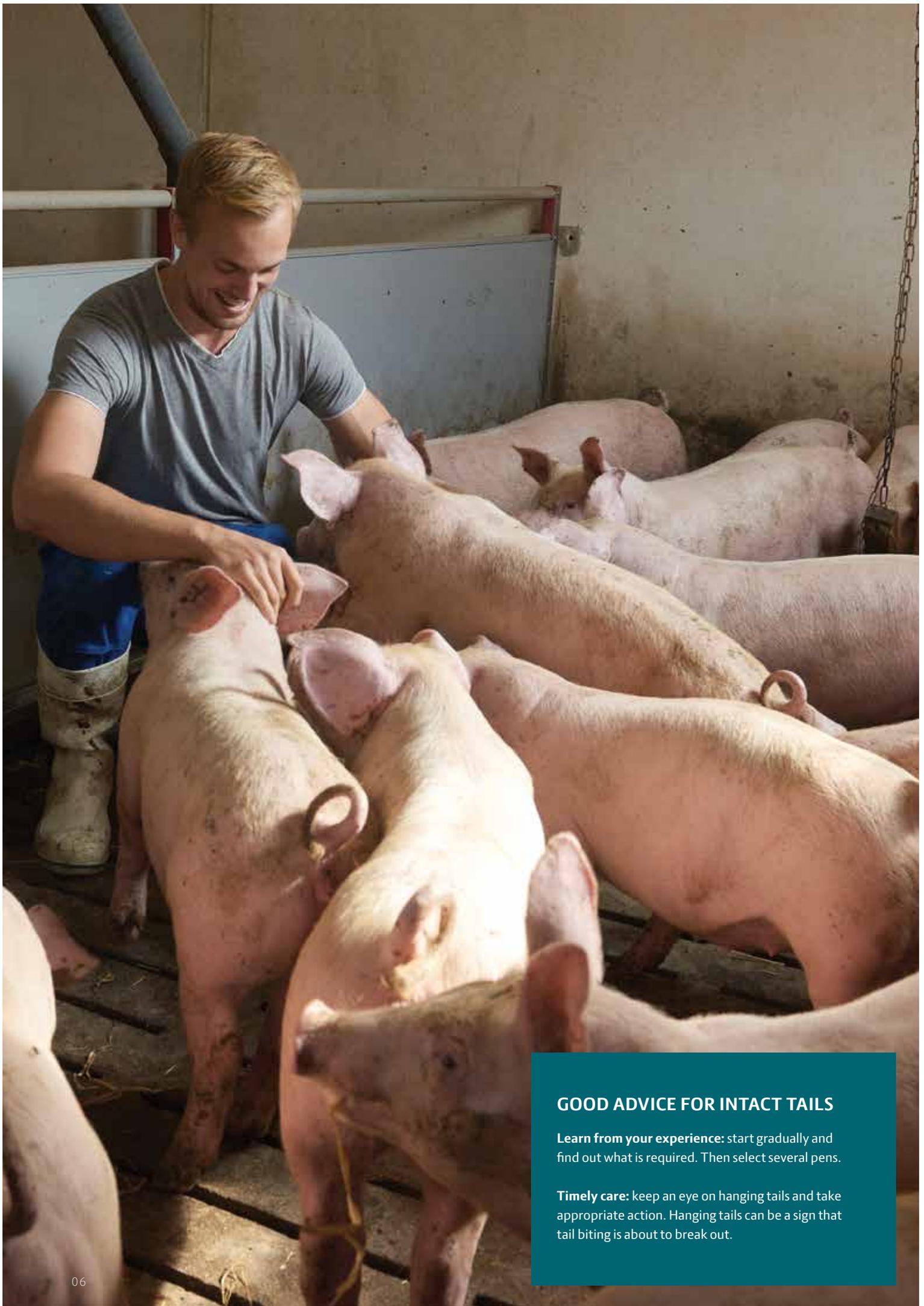
In addition to finding new solutions to achieving even more efficient and sustainable pig production in Denmark, we are also alert to events taking place around us. Indeed, we need the support of consumers and legislators to maintain our production efficiency. Last year, therefore, we drew up a three-year strategy which also addresses the wishes and demands of the world beyond the pig farm.

Colleagues at SEGES Danish Pig Research Centre together with the Board of Directors and the Innovation Council have a good insight into all that happens in the housing units. But you, too, have the opportunity to make suggestions about the projects we should be involved with in the future.

GLOBALLY COMPETITIVE BREEDING WORK

The Board of Danish Agriculture & Food Council, Pig Production also sets the direction for DanBred's breeding programme. Over the past three years, DanBred's research has enhanced the breeding progress for all the traits inherent in the breeding programme, including feed efficiency, which means that it is possible to use less feed to produce the same number of pigs than before. Not only does this improve your bottom line, it also makes production more sustainable.

Thank you for yet another successful year. We are looking forward to making further contributions to the success of Danish pig production.



GOOD ADVICE FOR INTACT TAILS

Learn from your experience: start gradually and find out what is required. Then select several pens.

Timely care: keep an eye on hanging tails and take appropriate action. Hanging tails can be a sign that tail biting is about to break out.

Success with intact tails

SUCCESS AT PRODUCING PIGS WITH INTACT TAILS FROM BIRTH TO SLAUGHTER REQUIRES A GRADUAL TRANSITION. THIS IS EVIDENT FROM THE “INTACT TAILS – ALL IN” TRIAL. SO FAR, 80,000 PIGS WITH INTACT TAILS HAVE BEEN PRODUCED AT THE FARMS PARTICIPATING IN THE TRIAL.

Danish Agriculture & Food Council, Pig Production have a goal that more Danish pigs must have intact tails from birth to slaughter. To secure knowledge in the field, the trial “Intact tails - all in” was started last year. In return for volunteering to take part, pig producers receive help and feedback from SEGES Danish Pig Research Centre’s experts on how to produce pigs with intact tails.

““ We have produced 80,000 pigs with intact tails so far as a result of our trial. There are, of course, many pig producers who are already producing pigs with intact tails,” says Senior Advisor Dorthe Poulsgård Frandsen.

In collaboration with Linda Sandberg Pedersen, a technician at SEGES Danish Pig Research Centre, Dorthe Poulsgård Frandsen has helped pig producers across Denmark adapt their production. A key criterion is to start gradually and learn from experience.

““ During our work on this project, we have seen the importance of beginning gradually

with individual pens - and then taking more and more weekly batches on an ongoing basis. In this way, you learn what to be aware of as well as what works and does not work,” says Dorthe Poulsgård Frandsen.

BETTER THAN EXPECTED

Joachim Clausen is one of the pig producers participating in the “Intact tails – all in” project. He runs an integrated pig production business just outside Sorø and produces 20,000 finishers per year. His first batch of pigs with intact tails was slaughtered last year, and since then the entire production has been converted so that all pigs sent to the slaughterhouse now have intact tails. According to him, the switch has gone better than expected.

““ The truth is that we have not experienced any major problems in making the switch. Of course, there were some challenges along the way before we got into the new routines, but we did have problems with tail biting before, so I haven’t regretted the move. Also,

the help and feedback from SEGES Danish Pig Research Centre has made it easier to get started quickly and do things correctly,” he says.

GOOD MANAGEMENT IS THE KEY TO SUCCESS

The most important thing to bear in mind when deciding to produce pigs with intact tails is to remain focused on the pigs. Tail biting leads to more tail biting, which is why it is important to intervene if, for example, any of the initial signs, such as hanging tails, are spotted. A solution may be to provide the pigs with more enrichment material so that they are distracted away from tails.

““ Of course, more time is needed to adapt to the new routines,” says Joachim Clausen. “But I can see that it has other positive side effects. Apart from intervening at the right time, we also discover if there are other issues in the pen.”





“ We don't know the reason, but we at SEGES Danish Pig Research Centre believe that the attention we attract by conducting these checks helps to keep the feed manufacturers on their toes.”

Jesper Poulsen,
Project Manager, SEGES Danish Pig Research Centre

Keeping an eye on feed manufacturers

DOES THE LABEL INSERT ON THE FEED CORRESPOND WITH THE ACTUAL CONTENTS? SEGES DANISH PIG RESEARCH CENTRE CARRIES OUT ANNUAL CHECKS TO VERIFY THIS.

“We want to be sure that the feed that pig producers buy contains what is written on the label,” says Jesper Poulsen, Project Manager, SEGES Danish Pig Research Centre and responsible for testing feed.

He has just revealed the results of the latest round of checks. Feed mixes from the major feed manufacturers are analysed to see whether the nutritional content in the feed is as stated on the label. The results of this year’s laboratory study should please pig producers – because the contents do correspond to the label.

IMPORTANT KNOWLEDGE FOR YOU

It is welcome news that feed manufacturers

keep to what they promise. The reason for checking feed is obvious:

“Feed represents the highest cost for pig producers, which means that they have to have value for money. It’s no good if the feed does not contain the nutritional content that it promises.”

As well as laboratory testing, SEGES Danish Pig Research Centre also conducts regular tests on premixed feed on the pigs.

“It’s one thing to examine the nutritional content in the laboratory – but quite another to ‘ask the pigs’. Even if we check the nutritional content through analysis,

there are other factors that affect pigs’ productivity. In other words, there are aspects to the quality of the feed that only the pig – and not chemical analysis – can tell us,” explains Jesper Poulsen.

“In 2019, we conducted a test on feed mixtures for finishers at our test station at Grønhøj. I’m glad to say that there were no issues here either. But even if things are going well, we cannot afford to be complacent. So, feed manufacturers should expect us to continue to keep an eye on them.”

CHECKING FEED

The feed manufacturers are happy to give the go-ahead for a spot check of their premises.

Technicians from SEGES Danish Pig Research Centre visit the factories and take samples at various times. The technicians also take away the relevant labels for checking against the samples. Some 16 feed samples are collected from each of the nine manufacturers.

The feed samples are sent for chemical analysis. Some 15 nutrients are analysed in each sample. The results of the analyses are compared with the manufacturer’s list of contents provided on the label (the declaration).

A calculation is made for the average discrepancy between the analysed and the declared value for each nutrient and for each manufacturer.

In addition to the checks on ready-mixed feed, SEGES Danish Pig Research Centre also carries out regular checks on mineral mixes where tests are collected from farms.

Sows in the right condition perform better

BY GIVING YOUNG FEMALES MORE ENERGY AND LESS PROTEIN IN THEIR FEED, JEPPE HAUBJERG BELIEVES THAT GILTS MILK BETTER AND DELIVER MORE LIVE BIRTHS.

Pig producer Jeppe Haubjerg is firmly focused on creating the best conditions for his sows. He does this so as to ensure that his sows have the best possible milking abilities and the highest possible number of liveborn piglets.

Alongside Thomas Sønderby Bruun, Special Adviser at SEGES Danish Pig Research Centre, Jeppe Haubjerg has been adjusting the feed his gilts get prior to service. This is part of the Barometer Herd project whose aim is to transfer existing knowledge into the housing units.

“The aim of our collaboration is to ensure that the knowledge we generate at SEGES Danish Pig Research Centre is put to practical use at the farm. Our work with Jeppe is all about ensuring that the gilts are in the right condition prior to service. It was also important for us to re-establish the sows' loss of back fat during their nursing period as soon as possible after weaning – without them having too much protein,” says Thomas Sønderby Bruun.

Thomas Sønderby Bruun and Jeppe Haubjerg have been studying the growth of gilts prior to insemination. Together, they have put together a plan for increasing the

thickness of back fat. This means the gilts' daily energy allocation is increased, and their back fat increases in turn. Moreover, the sows' condition is re-established by allocating more energy.

“When we started, we could see that both gilts and sows had too little back fat during service and the same applied to our sows during farrowing. So we wanted to change that to see how it changed their milking abilities,” explains Jeppe Haubjerg.

CONTINUING FEEDING

Once a day, the gilts receive a supplement comprising barley, wheat, a little fat and minerals in order to give them more energy without them getting too much protein. Almost half a year into the trial period, Jeppe Haubjerg can already see a beneficial effect from this.

“There's a clear correlation between the thickness of their back fat when they are serviced and their subsequent efficiency. Between 15 and 18 mm back fat is the optimum amount. With a greater or lesser amount than that we found that we have fewer liveborn. It's as if they either lack the energy they need if they get too little energy

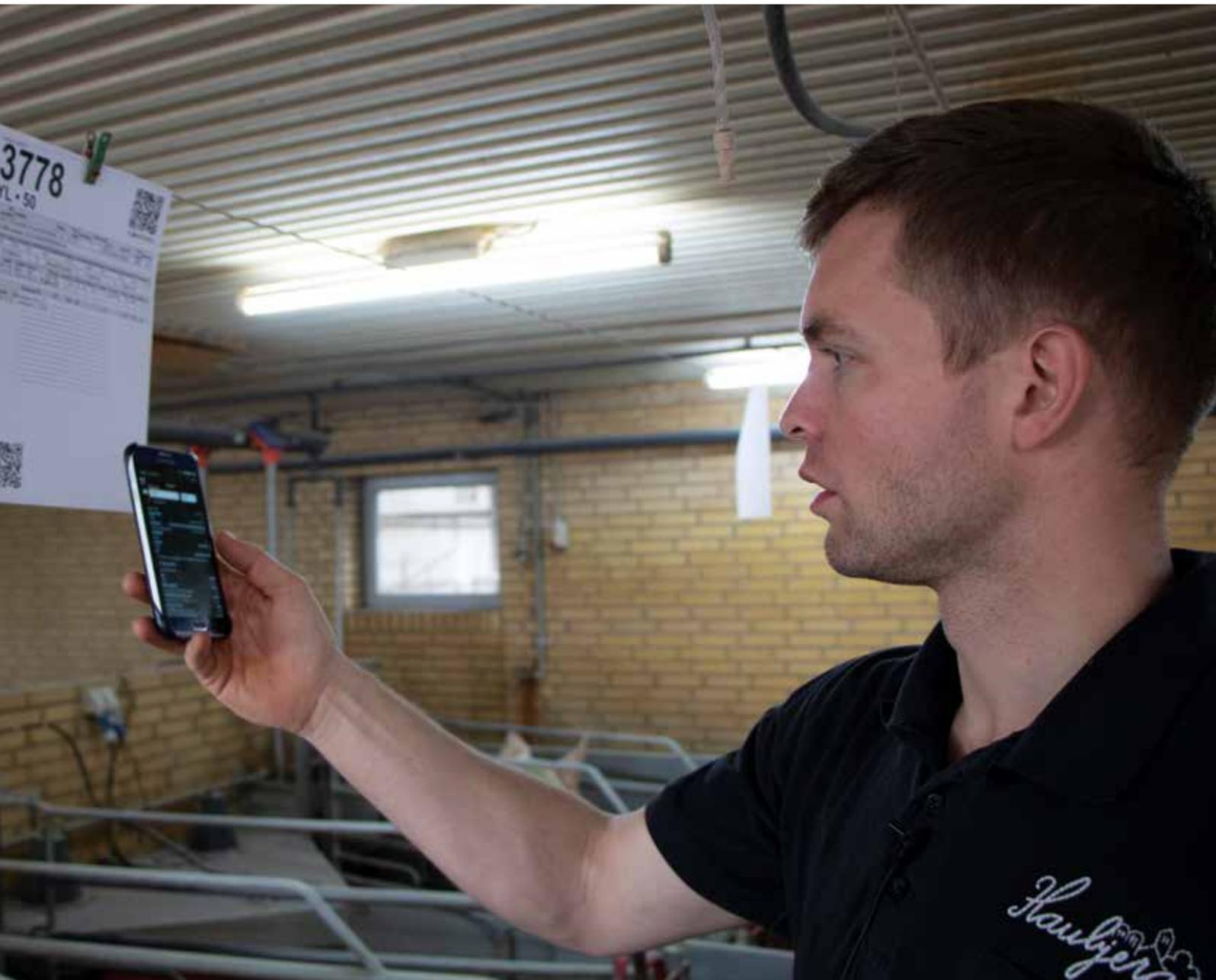
or they become too fat. And we can see that in the statistics,” says Jeppe Haubjerg.

The findings are supported by Thomas Sønderby Bruun, who refers to research from both Denmark and abroad.

“Both Danish and international research has shown that sows with medium back fat – whether between 15-18 or 16-19 mm – are inferior, but these sows will most often have the fewest stillborn, produce the most milk and wean more pigs compared to lean and fat sows,” he explains.

The collaboration between Jeppe Haubjerg and Thomas Sønderby Bruun will continue in 2020. With the experience already gained there is no doubt that Jeppe Haubjerg will continue to feed his gilts with the new mixture.

“So far we have given the energy supplement by hand. But we will certainly continue with it in some form or another. Maybe we shall make another feed mix or a supplement of some kind. However, I've no doubt that this is something that we'll continue with – and also when the project is concluded,” says Jeppe Haubjerg.



“There’s a clear correlation between the thickness of their back fat when they are serviced and their subsequent efficiency.”

Jepe Haubjerg, Pig Producer

Supplementary nutrition: make the right choice

LOWER FEED COSTS BUT THE SAME DAILY GROWTH FOR PIGLETS AND WEANERS. THIS IS ONE OF THE BENEFITS OF REPLACING SUPPLEMENTARY MILK WITH WET FEED IN THE FARROWING UNIT. BUT MINI WET FEEDING SYSTEMS THAT CAN DO THIS ARE EXPENSIVE TO SET UP.

Should you opt for milk replacement or a combination of wet feed and milk replacement for piglets? This is a question worth asking if you have supplementary nutrition in the farrowing unit. Milk replacement is a large item on the budget whereas wet feed is rather less expensive.

“ We have known about milk systems for several years, but a few years ago, a so-called mini wet feeding system came on to the market. This is a system that can allocate a combination of wet feed and milk replacement. The advantage of this feeding strategy is that wet feed is far cheaper,” says Special Adviser Marie Louise Madelung Pedersen from SEGES Danish Pig Research Centre.

To investigate whether it pays to go for a less expensive feed strategy SEGES Danish Pig Research Centre has examined the two feeding strategies' influence on growth.

SEVERAL OPTIONS

The investigation has shown that piglet and weaner growth in the two groups is largely identical. This means that it makes sense to opt for the less expensive feeding strategy.

“ In our test we saved DKK 3 per pig by introducing wet feed through a mini wet feeding system instead of just giving milk throughout the entire period. However, the system has a snag: firstly, setting it up is expensive, and secondly, the system cannot offer more feed than you can give by hand. You need to decide, therefore, whether the investment is necessary or whether you would prefer to hand feed,” says Marie Louise Madelung Pedersen.

SEGES Danish Pig Research Centre is currently investigating whether dry feed or wet feed is the best solution for supplementary nutrition for reducing the risk of weaning diarrhoea.

To offset the high feed price in the milk system, some sow units have installed mini wet feeding systems. As well as milk replacement, these systems can provide wet feed which is equivalent to pre-starter or weaning feed in the farrowing unit. There is a small trough in the partition between two pens from which the pigs can eat and drink.

The benefit of a mini wet feeding system is that it is possible to control what the pigs eat. However, if a large yield is required, time at the feed computer needs to be prioritised together with a greater focus on hygiene.



“ We have known about milk systems for several years, but a few years ago, a so-called mini wet feeding system came on to the market. This is a system that can allocate a combination of wet feed and milk replacement.”

Marie Louise Madelung Pedersen,
Special Adviser, SEGES Danish Pig Research Centre

New knowledge produces more robust DanBred pigs

SEGES DANISH PIG RESEARCH CENTRE, WHICH IS RESPONSIBLE FOR DANBRED'S BREEDING PROGRAMME, HAS DEVELOPED A NEW METHOD TO EVALUATE CONFORMATION – ONE THAT ENSURES GREATER BREEDING PROGRESS FOR THE TRAIT.

A more robust breeding stock delivers a better bottom line. A new method currently being tested to evaluate the conformation of all DanBred pigs is therefore set to benefit DanBred's customers.

““ For many years, we have been breeding for conformation and so far, we have been using the overall score of the pig to assess which pigs are best in terms of conformation. However, breeding technicians always evaluate conformation for the sub-categories – forequarters, hindquarters and back. The new method combines the data from these categories with the overall score of the pig, which is found to have the maximum genetic variance and thus a higher heredity compared to the overall score on its own,” says Birgitte Ask, Chief Scientist at SEGES Danish Pig Research Centre.

BETTER BOTTOM LINE

That all the data can now be used in a new way means that the most robust breeding

stock can be selected, which will increase the breeding progress for conformation. The method was implemented this summer and is expected to result in increased breeding progress for conformation from 2 to 5 per cent.

““ The improved conformation trait is better at distinguishing between the animals, which means selecting the strongest pigs as parent pigs for the next generations

in the breeding programme will be easier and more accurate. For the individual pig producer, the outcome is that the next generation of gilts, sows and finishers will have better conformation, which will not only benefit a pig's robustness throughout the production cycle, but also the earnings of the pig producer,” says Birgitte Ask.

SEGES DANISH PIG RESEARCH CENTRE WORKS FOR YOU

The Board of Danish Agriculture & Food Council, Pig Production, decides on the composition of breeding work, which breeding goals are weighted and how. The breeding and development work for DanBred is handled by SEGES Danish Pig Research Centre, which is always alert to how further pressure can be applied to the breeding progress in the traits of the breeding goal. SEGES Danish Pig Research Centre is also focused on how new methods can be brought into play so that DanBred genetics are world class – now and in the future.



Longevity
(proportion)
0.01

Daily gain
30 kg – slaughter
(g/day)
18

Daily gain
birth - 30 kg
(g/day)
1

Feed
conversion
(kg feed/kg gain)
-0.041

Lean meat
percentage
0.17 (%)

Conformation
(points)
0.11

Male fertility
(piglets born/litter)
0.20

Killing out
(kg)
-0.03

LP5
(living piglets
on day 5/litter)
0.33

The average annual genetic progress over the past three years.



“Of course, a DANISH visit involves work. But the things that are checked should already be under control. And if there are a few things that we’re not quite on top of, the visit gives us a chance to make small adjustments so that our production gets back on track.”

Lene Tærsker Madsen, pig producer

Vigorous requirements pay off

DANISH IS YOUR TICKET FOR SELLING BOTH LIVE PIGS AND PIG MEAT – NATIONALLY AND GLOBALLY. THE QUALITY SCHEME ALSO ENSURES THAT WE PROTECT DENMARK FROM DISEASE.



Every time Germany's HoWe's customers bite into an original Nürnberger Rostbratwurst*, they get a taste of DANISH – Danish pig production's quality assurance programme.

“When we buy Danish pig meat, we know that we're buying into a high-quality standard – in terms of food safety, consistency and animal welfare. This is the reason why we use meat from Danish pigs in our production,” says Florian Hoeneß, CEO, HoWe.

Because of the high-quality standards, HoWe can also supply U.S. customers where Danish meat alone is used in their sausages.

“For importers of Danish pig meat around the world, it is important that we have a well-functioning quality assurance scheme with rigorous requirements. They should be able to rely on the fact that they get the same high-quality standard every time. This applies to both the export of pig meat and to live pigs,” says Asger Kjær Nielsen, who is responsible for DANISH.

PUTTING OUR OWN HOUSE IN ORDER

A vast majority of the countries that import Danish pigs or pig meat stipulate that it be produced under a number of specific requirements. Other countries have similar quality assurance schemes. Several of the countries that import Danish pig meat or piglets demand that, as a minimum, we meet their own quality scheme.

It is not only in export markets that the DANISH Product Standard is of significance to Danish pig production, however. The general public also trust DANISH.

PRIORITISING HEALTH

Where the DANISH Product Standard ensures that we deliver a high standard of quality within the applicable rules and regulations, the DANISH Transport Standard combined with the SPF system ensures that health and protection against infection receive top priority.

One of the areas where the risk of infection is highest is in transport, including the vehicles

ABOUT DANISH

The DANISH Product Standard is Danish pig production's quality scheme which ensures and documents that Danish pig producers comply with Danish legislation and industry requirements. In particular it focuses on animal welfare, a high standard of food safety and clear traceability. Some 3,000 certificates are carried out every year.

The DANISH Transport Standard sets out the cleaning and disinfection requirements for vehicles arriving from outside Denmark with the purpose of preventing the entry and outbreak of diseases such as African Swine Fever and Foot & Mouth disease in Denmark. Every year, some 28,000 animal transport vehicles arriving in Denmark from abroad are washed and disinfected.

that collect pigs for export. It is important, therefore, that they are completely clean when they arrive on the premises of a Danish pig producer. To ensure this, all animal transport vehicles receive an extra external wash and are disinfected inside and out when they arrive in Denmark.

“Every year, some 28,000 vehicles are washed after they have crossed the border into Denmark. We do this so as to prevent diseases from entering the country,” says Asger Kjær Nielsen.

*HoWe Wurstwaren KG is one of the leading producers of the original Nürnberger Rostbratwurst – sausages that have to be produced in Nuremberg according to a set and protected recipe.

It pays to follow the standards

FEED STANDARDS HAVE BEEN AMENDED SO THAT THEY CONTINUE TO DELIVER THE BEST POSSIBLE FINANCIAL RESULTS.

A few pence here, a few pence there. It does not sound much but if you multiply these small amounts with the total number of pigs produced in Denmark, you are looking at quite a large figure. This is why SEGES Danish Pig Research Centre is constantly focused on feed standards in order that they deliver the best possible financial results for all Danish pig producers.

“One of our new initiatives is to change the structure of the sets of standards to make them simpler when it comes to optimising feed mixes – in part for home-mixed feed but also for the feed manufacturers,” says Chief Consultant Niels Morten Sloth, who is one of those responsible for the ongoing development of the standards.

In addition to making changes to the structure, a new set of standards has been introduced for growing pigs, which have a special category.

“We believe that the new structure and the addition of growing pigs as a category will make it even easier to ensure the best possible feed composition and thus an improved bottom line for the producer,” says Niels Morten Sloth.

ONE KRONE MORE PER PIGLET

In connection with the changes to the standards, efforts have also been made to increase the addition of free amino acids for piglets. Some 28,303 piglets have taken part in the trial and the results are graduated

amino acid profiles for both piglets and growing pigs.

“The trial has proved that protein in piglet feed can be utilised 5–10% better than previously thought. The significance of this is that we can better utilise protein, which is expensive, and, for example, save around 8 grams of digestible protein per feed unit per pig in a protective diet. This will provide a higher contribution margin of around DKK 1 per pig,” says Niels Morten Sloth.

“GREAT TO MAKE A DIFFERENCE”

The graduated amino acid profile trial was conducted at Spøttrup Pig Production. The owner, Søren Andersen, is pleased to have contributed to the development of Danish pig production.

“It’s fantastic that we have a system like SEGES Danish Pig Research Centre to define the standards, so we don’t just waste unnecessary money on nothing. While we ran the trial, we did not notice any great difference, but when you look at the statistics, it’s clear that it does make a difference as to what standards you follow. And then it’s great to be able to help make a difference,” he says.

The trial has also clarified that adding more amino acids does not necessarily add value.

“We know that the higher the allocation of amino acids the greater the growth of the pigs. But this is not necessarily the most profitable in the end when you take into

account the prices of amino acids, protein, etc. Consequently, it’s good that there’s someone sitting with the calculator and doing the calculations based on actual research,” he says.

By following the new standards, there is therefore money to be saved in terms of the smaller addition of protein. There is also the health value because a lower protein level can mean healthier pigs, less need for treatment and less environmental impact. Indeed, if you buy pre-mixed feed, you will already be enjoying the effect.

“In the light of our findings, we have been in discussions with feed manufacturers and DLBR advisers, who have changed the composition of the nutrients so that they now comply with the new standards. Most pig producers in Denmark will therefore achieve greater margins automatically,” says Niels Morten Sloth.





“It’s really great to be part of a trial such as this. As well as helping to develop Danish pig production, the interaction with SEGES Pig Research Centre provides fresh inspiration for new ways to tackle our work.”

Søren Andersen, owner,
Spøttrup Pig Production

Danish protein for sows is not far away

NEW TRIALS HAVE SHOWN THAT UP TO 15 PERCENT OF FAVA BEANS CAN BE MIXED IN SOW FEED WITHOUT COMPROMISING EITHER THE LITTER'S DAILY GAIN OR THE REPRODUCTION RESULTS.

The world's increasing soy consumption and the consequent risk of price rises have enhanced the interest in alternative protein sources. Moreover, increasing imports of soybean meal have fallen under the political spotlight because of the impact on the climate. It makes sense, therefore, to investigate other climate-friendly alternatives to soybean meal. This is why fava beans are interesting because they can be produced locally.

“So far, our recommended admixture percentage has been 0 percent for sows. This was based on previous trials from the 1970s. But the available varieties have improved so that they give both a higher yield and have a lower content of harmful substances. We have, therefore, recently conducted research into how much can be mixed without productivity being

compromised,” says Else Vils, Chief Scientist at SEGES Danish Pig Research Centre.

The new trial has shown that it is possible to add up to 15 per cent variegated flowered fava beans as a replacement for 6-7 percent soybean meal and 8-9 per cent cereal and wheat bran.

“The climate is high on the agenda, which is why it makes sense to use locally-produced protein sources whenever it is possible and cost-effective to do so,” says Else Vils.

FAVA BEANS FROM BIRTH TO SLAUGHTER

Fava beans as an alternative to soybean meal have not only been trialled for sows. SEGES Danish Pig Research Centre has also conducted trials on piglets and finishers where it is possible to replace up to 25 per

cent for piglets and 20 per cent of the feed for finishers with fava beans.

“Admittedly, not all soybean meal can be replaced, but it's a start. And I believe that, in the years ahead, we will become even better at finding alternative protein sources for pigs,” says Else Vils.

NEW RECOMMENDED ADMIXTURE LIMITS

Fava beans with low tannin content:

Lactating sows:	max. 15 %
Nursing sows:	max. 15 %
Piglets:	max. 25 %
Finishers:	max. 20 %





Greater focus on piglet survival rates

THERE IS CONSTANT FOCUS ON INCREASING THE PIGLET SURVIVAL RATE IN DANISH HOUSING UNITS. SEGES DANISH PIG RESEARCH CENTRE HAS A NUMBER OF INITIATIVES UNDERWAY TO HELP PIG PRODUCERS DO EVEN BETTER.

The body temperature of all piglets drops abruptly after birth. Ensuring that the smallest piglets are kept warm after farrowing has been a particular focus area in several trials. In a new trial, SEGES Danish Pig Research Centre has shown that the temperature of the smallest pigs rises when terrace heaters are installed on each side of the sow.

“ Our trial has shown an increased temperature among pigs, which is positive. Unfortunately, the challenge is that terrace heaters require so many watts that not only are they expensive, but they require far more sockets and phases than there are in the housing units. We're therefore looking into viable alternatives,” says Senior Advisor Dorthe Poulsgård Frandsen.

The heat source trial next to the sow is just one of the new initiatives that is underway to find ways to increase the survival rate.

HELP AT HAND

However, there is no need to wait for the latest findings. There are already many specific pieces of advice available as to how the piglet survival rate can be increased, including Farestaldsguide.dk (Farrowing Unit Guide) which has recently been updated. The guide contains videos, pictures and text describing what should be done before, during and after farrowing.

Many stockpersons working in the farrowing unit know what to do during farrowing. But finding answers to questions quickly is always a good thing – plus the guide is available in English and Danish.

CAUSE OF DISEASES

Advice for increasing the piglet survival rate includes determining the reason why piglets do not survive. The Laboratory for Pig Diseases therefore offers post-mortem examinations of piglets where veterinarians carry out a thorough analysis to determine the cause of death.

“ When piglets fail to survive, farm workers don't always make connections. The cause of death can be blood poisoning, for example. And when you can see things for yourself, it is, of course, easier to take action,” says Svend Haugegaard, Senior Veterinarian at the Laboratory for Pig Diseases.

MANY ENLIGHTENING TRIALS UNDERWAY

The list of new trials designed to increase the piglet survival rate is long. Here is a small – but by no means exhaustive - selection.

Increased blood sugar up to farrowing

By increasing the sows' blood sugar just before farrowing, it is possible to have faster farrowings and fewer stillborn piglets. Faster farrowing also reduces the impact during the critical period around farrowing and has a positive impact on the sow.

Camera monitoring of farrowings

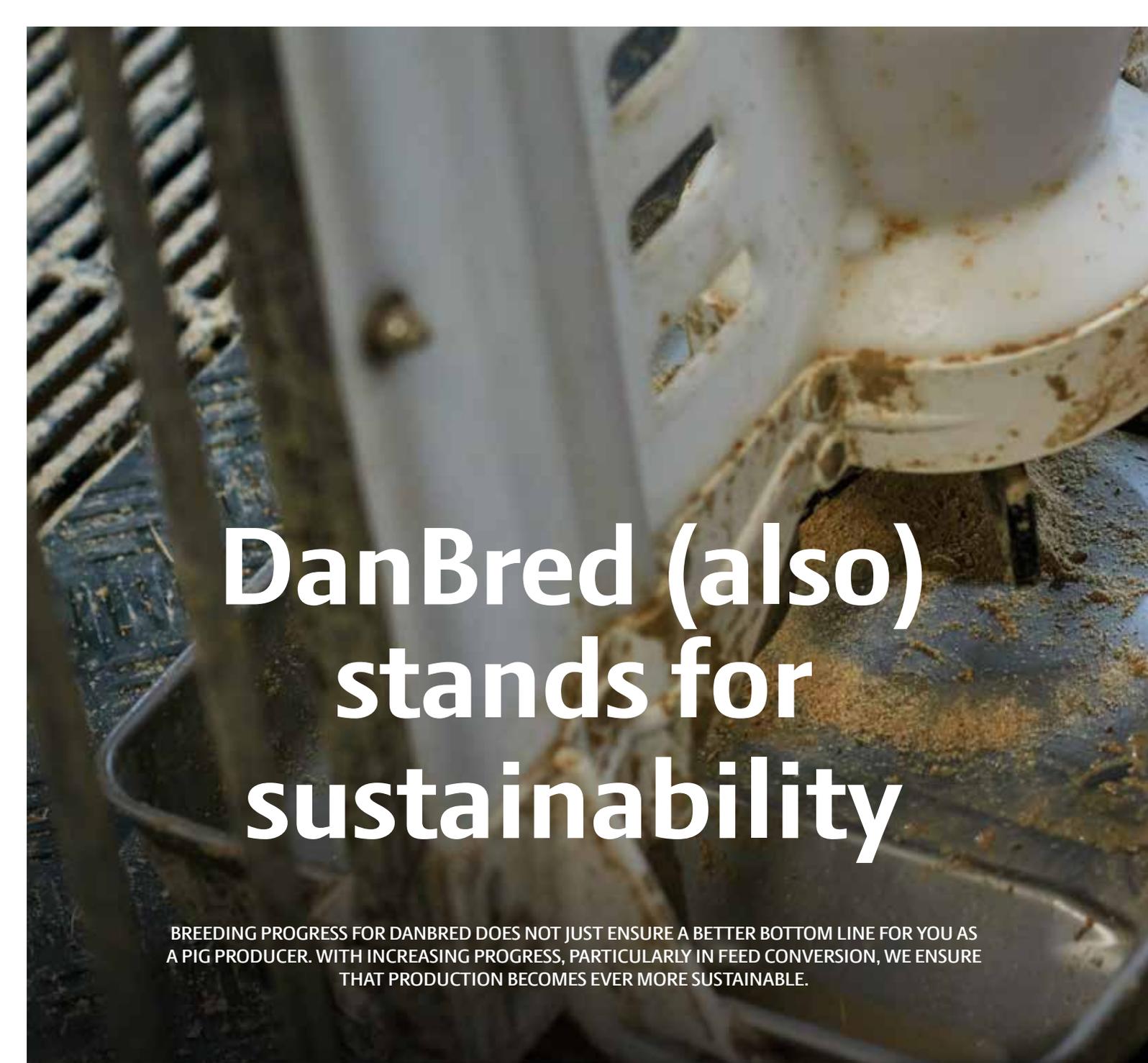
A camera behind the sow can record farrowings and alert stockpersons if the farrowing stops and obstetric assistance is required.

PigletLife 2.0

We are repeating our past success and providing the opportunity to make a targeted effort to increase the piglet survival rate.

Expert group

In addition to the aforementioned initiatives, the Expert Group, which was established last year, is continuing. The group is designed to put forward specific proposals as to how the survival rate can be increased.



DanBred (also) stands for sustainability

BREEDING PROGRESS FOR DANBRED DOES NOT JUST ENSURE A BETTER BOTTOM LINE FOR YOU AS A PIG PRODUCER. WITH INCREASING PROGRESS, PARTICULARLY IN FEED CONVERSION, WE ENSURE THAT PRODUCTION BECOMES EVER MORE SUSTAINABLE.

Sustainability, the climate and the environment are high on the agenda of public debate – not just among the public at large but also within Danish agriculture.

Our work is ongoing in areas such as slurry acidification, regular slurry discharge and feed conversion. And DanBred's breeding work plays an important role in the work to ensure more sustainable and more climate-friendly production.

“ We are firmly focused on maximising our breeding progress for the benefit of

DanBred's customers and this has been the case for many years in all the traits we have in our breeding goals, including feed conversion. This is not only beneficial for DanBred's customer's bottom line, but also in terms of making their production more sustainable,” says Tage Ostensen, Head of Department at SEGES Danish Pig Research Centre, which is responsible for the development of DanBred's breeding programme.

MORE FOR LESS

In short, the significant breeding progress for DanBred genetics in recent years means

that pig producers can produce more or the same number of pigs with fewer resources. Genomic selection, i.e. DNA testing of all breeding candidates, has made a significant difference to breeding progress since it was introduced gradually in 2010.

“ As we know all the breeding animals' DNA – so to speak - and their relations to each other, we can more easily find the breeding candidates that have the best genetic system for the traits that we want to develop. This means that we breed for even better feed efficiency and other traits,” says Tage Ostensen.



It is precisely these traits, which are of great value to both the pig producer and the environment, that have seen significant progress in recent years.

“ Breeding for LP5 (living piglets on day 5/ litter) means that DanBred sows have more pigs than before. This means that fewer sows can produce just as many finishers, which reduces our climate footprint. The progress in feed conversion has also meant that less feed is needed in production. In this way, everything forms a synthesis,” says Tage Ostensen.

PRODUCTION SCALE - EFFECT OF THE BREEDING PROGRAMME

Year sows

2005 1,151,000

2018 1,045,000

Produced pigs per year (million)

2005 25,800

2018 32,700

Source: extract from Statistics Denmark and statistics from Danish pig slaughterhouses

A future without therapeutic zinc oxide

AN INTERNATIONAL CONFERENCE WAS ATTENDED BY SCIENTISTS AND EXPERTS FROM 33 COUNTRIES WITH KNOWLEDGE THAT CAN BE APPLIED BY PIG PRODUCERS ACROSS THE WORLD. THE QUEST TO FIND ALTERNATIVES TO ZINC OXIDE BEFORE A BAN COMES INTO FORCE BY 2022 HAS BEGUN.

The European Commission has decided that by June 2022 the therapeutic use of zinc oxide as a means of reducing diarrhoea in weaned pigs will be phased out. The dilemma we face as an industry was the trigger for SEGES Danish Pig Research Centre hosting the Zero Zinc Summit in June – a conference that brought together the world's leading scientists and experts in the field.

“We know experts around the world have a lot to offer in terms of their knowledge of feed, health and diagnostics. Many of the same mechanisms come into play when we talk about reducing antibiotics in the treatment of piglet diarrhoea. All of us have an incentive to share our knowledge, particularly here in Europe, so that we have solutions in place for weaning without the therapeutic use of zinc oxide when the ban comes into force,” says Lisbeth Shooter, Senior Manager, SEGES Danish Pig Research Centre.

One of the keynote speakers at the conference was veterinarian Nicolai Weber from SEGES Danish Pig Research Centre. He is currently working on a project in collaboration with several Danish veterinary

practices to bring together and assimilate knowledge on how pigs can be weaned without the therapeutic use of zinc oxide – and obviously without increasing the use of antibiotics.

“It was good to share experiences with colleagues from across the world and hear their thoughts on how they are trying to solve the challenge. But producing pigs in Denmark is different from producing pigs in Australia or in Germany for that matter. Therefore, we need to adjust our own experiences and those of our non-Danish colleagues so that they can also be used in Denmark,” says Nicolai Weber.

“In our work, we have talked to certain pig producers who have managed to phase out the therapeutic use of zinc oxide. We have done this to flesh out their practical experiences so that we can try out new initiatives on them in the new year with a view to them becoming even better. We can then share these experiences with other pig producers to enable them to be ready to produce without the therapeutic use of zinc oxide.”



Lisbeth Shooter and Nicolai Weber are both part of the SEGES Danish Pig Research Centre's "Zinc unit". A unit with experts working to find viable alternatives to zinc oxide.

ZinkGuide.dk: HOW READY ARE YOU?

SEGES Danish Pig Research Centre has produced ZinkGuide.dk. This will be regularly updated and provides some good advice on where you should focus your efforts to reduce the risk of diarrhoea in just-weaned pigs, thereby reducing the need for zinc oxide.

The guide also contains a number of check lists in five different languages. You can either print them out or email them to your employees.

Finally, the guide contains the Zinc Challenge test comprising 12 questions. By answering these you will see how close you are to the objective of being able to phase out the therapeutic use of zinc oxide.





Protein reduction against diarrhoea

It is possible to reduce the occurrence of diarrhoea and also the use of antibiotics by reducing the protein content in feed. Reducing the protein ration, however, results in a lack of limiting amino acids which cannot be added and thus leads to inferior productivity. SEGES Danish Pig Research Centre has therefore benchmarked four protein strategies against two control groups. One of the control groups was given zinc oxide while the other was not.

“From our experiment we have discovered how far the protein content can be reduced by adding amino acids in free form to limit the negative impact on productivity,” says Chief Consultant Niels Jørgen Kjeldsen.

“The experiment has shown that two of the four protein strategies could reduce the number of diarrhoea treatments without any significant effect on productivity – if reducing the protein ration is only

compensated by the addition of more free amino acids. The results from the experiment have been taken into account in the updated amino acid standards. So, my message is: follow the standards for amino acids for piglets if you want to reduce the therapeutic use of zinc oxide,” says Niels Jørgen Kjeldsen.

Read more about the new standards on page 18.



New measuring equipment shapes future environmental technology

CONSTANT FOCUS ON NEW ENVIRONMENTAL TECHNOLOGY ENSURES THAT DANISH FARMERS ARE ABLE TO COMPLY WITH THE REGULATIONS PERTAINING TO THE EXPANSION OF HOUSING UNITS – OR THEIR CONSTRUCTION. SEGES DANISH PIG RESEARCH CENTRE HAS DEPLOYED A NEW 'WEAPON' TO ENSURE MORE ACCURATE MEASUREMENTS.



“

The new tool is far more precise than the old method and far less onerous. So, as far as I'm concerned, we have really taken a step forwards.”

*Simon Wilhelm Yde Granath,
Senior Adviser at
SEGES Danish Pig Research Centre*

Requirements regarding future pig production are constantly changing. This means that the requirements from the environmental technology designed to ensure a good environment in and around Danish pig housing units are becoming more rigorous. As one of the few organisations in Denmark to do so, SEGES Danish Pig Research Centre has recently invested in so-called PTR-MS measuring equipment, which can determine the concentration of odorants in the analysed air. This means that SEGES Danish Pig Research Centre can now measure the effect of environmental measures on odour emissions more precisely than before.

Until very recently, the method of doing this - roughly speaking - consisted of filling a bag with the air that was to be measured. This would then be packed securely into another bag and placed in a box. This was done three times - typically at 11 am, at noon and at 1 pm. The three samples would then be sent to a laboratory where a panel of four participants would smell a diluted version of the contents of the bag. Gradually, the percentage of housing unit odour was

increased until the test panellists could smell the contents. And from that an odour value was determined.

“This method works - but the new tool is far more precise than the old method and far less onerous,” says Simon Wilhelm Yde Granath, Senior Adviser at SEGES Danish Pig Research Centre.

“ The new method enables us to measure the air directly, e.g. just before and just after the use of an air purifier. Also, we're not dependent on a panellist's subjective sensory assessment of when they can smell the contents; and we can get measurements 24 hours per day instead of only three point measurements. This is because the equipment is always in place and ready to measure odour over a given period. We therefore get a much more precise assessment of how much odour is removed from the air,” says Simon Wilhelm Yde Granath.

FUTURE POTENTIAL

The PTR-MS measuring equipment is currently used to measure air purifiers. It has

already been used to get the Agri AirClean air purifier from Agrifarm A/S listed on The Danish Environmental Protection Agency's technology list while Skov A/S' new air purifier is also being evaluated. But the measuring equipment can do more than just take precise odour measurements from air purifiers.

“ If you imagine a change in the composition of a feed that lowers the emission of an odorous substance, e.g. methanethiol, then we know very little about what might be discharged instead. But with the PTR-MS measuring equipment we can measure a large number of substances, so we can be certain that we really are making progress and not just emitting other odorous substances,” says Simon Wilhelm Yde Granath.

The PTR-MS measuring equipment can be used in a large number of contexts. In addition to measurements in various environmental technologies, it is also used for various pieces of research in collaboration with SEGES Danish Pig Research Centre and Aarhus University.

Contingency measures are at hand in an emergency

IN JULY, PRRS1 (PORCINE REPRODUCTIVE AND RESPIRATORY SYNDROME) WAS CONFIRMED AT A DANISH BOAR STATION. FORTUNATELY, THIS LAST HAPPENED 17 YEARS AGO, BUT WHEN IT DOES, SEGES DANISH PIG RESEARCH CENTRE'S VETERINARY CONTINGENCY MEASURES ARE DEPLOYED.

All Hatting boar stations receive fortnightly visits from Health Control, which is part of SEGES Veterinary and Quality Services. On these occasions, veterinarians from Health Control take blood samples in every section of the boar station.

On July 26th, what we work to avoid on a day-to-day basis happened: a blood sample showed the PRRS antibodies and a few minutes later, a sales ban was imposed at Hatting in Horsens.

“Fortunately, we rarely see PRRS at Danish boar stations. Last case was 17 years ago. And this is something we take very seriously of course,” says Bent Nielsen, who heads up the Veterinary and Quality Services.

A MAJOR ENQUIRY

When a disease is detected at a Danish boar station, veterinary contingency measures get underway, which is what happened in July. Shortly after the PRRS antibodies were detected in a blood sample from Hatting in Horsens, representatives from Health Control travelled to Hatting Horsens to take more blood samples and to check whether this was a case of a so-called false positive. The following Monday, the results from the blood samples arrived, which unfortunately confirmed that the tests were positive. PCR analysis of previous blood samples showed that the infection had arisen in the herd in the first week of July. Where a traditional blood sample shows whether there are antibodies

– i.e. traces of a virus – a PCR analysis can show both the presence and amount of a given type of virus.

The important thing in this situation is to contain the damage, which is why the Veterinary and Quality Services at SEGES Danish Pig Research Centre decided that all breeding and multiplier herds that had received semen from the affected boar station between 1st and 26th July should be tested for three consecutive weeks.

“Our investigations were concluded on 1st September and showed that three multiplier herds and a quarantine unit had been infected. We are now working to eradicate PRRS in these herds,” says Bent Nielsen.

With regard to production herds, it was not possible to get a list of farms that had purchased semen between 1st and 26th July. Therefore, we called for all herds to be tested for PRRS.

A PARTICULAR VARIANT OF THE PRRS VIRUS

Although the work to analyse the blood samples from the breeding and multiplier herds is now concluded, focus on the situation continues, including whether the infected herds were infected via the semen from Hatting Horsens.

“Genetic investigations of the PRRS virus from Hatting Horsens have shown that this variant of the PRRS virus is a very special one that we have never seen before and which is a combination of two other PRRS variants. This new PRRS variant is therefore known as Horsens PRRS. Our investigations have also shown that the combination of the two PRRS variants did not arise in Horsens, which means that there is another source of infection that we cannot identify,” says Bent Nielsen.

“The new PRRS variant has been shown to cause more serious symptoms than those that are present in many herds. Of course, we need to find out the extent of the infection from Hatting Horsens and how we solve the problem. However, it will be relatively easy to identify whether the infection has come from semen from the boar station in Horsens or whether it has occurred in another way because it's a new PRRS variant,” says Bent Nielsen.

HELP AND ADVICE

While further enquiries are underway, there is a close collaboration with all Denmark's pig veterinarians and farmers so they can receive the best advice.

In addition, efforts are being made to improve contingency measures, including the testing of boar stations on a weekly basis. New procedures for communicating to customers will be also introduced in case this should happen again.



SOL-10-18021



Less expensive finisher units in future

BY FOLLOWING FIXED STANDARDS AND USING LESS EXPENSIVE MATERIALS, SIGNIFICANTLY LESS EXPENSIVE FINISHER UNITS CAN BE BUILT IN FUTURE.

“ You could call it the pig housing’s answer to the system-built house. It contains everything required for the optimum housing unit – no more, no less”.

This is how Kenneth Poulsen, Construction Manager at SEGES, describes the Concept Housing Unit, a pig housing system constructed according to a fixed design and less expensive facade panels. It also provides for the option of a narrower design. Plus, it delivers significant savings on the pad foundation compared to a traditional building.

“ In short, we have created a concept that sets out how to build a finisher pig unit quickly and competitively. The Concept Housing Unit follows certain fixed standards that have been defined in collaboration

with a number of experts in the area. This makes the building process quicker and less expensive,” says Kenneth Poulsen.

The new type of housing unit is built using sandwich panels with PIR foam, which is a far less expensive material than the traditional type. The concept builds on the Letstalden (Easy Unit) project where the project group worked with various types of building materials.

SIGNIFICANTLY LESS EXPENSIVE

SEGES Danish Pig Research Centre’s calculations show that the Concept Housing Unit with its aforementioned shell will be around DKK 500 less expensive per pen place compared to the traditional construction. If this is combined with a higher level of standardisation in both

housing and equipment, the savings will probably be even greater.

“ It is one of Danish Agriculture and Food Council Pig Production’s strategic goals to produce more finishers in Denmark. To maintain or increase finisher production, it is therefore important to reduce the need for capital and increase profitability,” says Kenneth Poulsen.

“ The Concept Housing Unit is, of course, designed with focus on high welfare standards, a good working environment and low antibiotic usage. In other words, the framework has been determined on the basis that it should meet the requirements of future finisher production where greater competitiveness and production safety are a must,” says Kenneth Poulsen.



Loose-housed sows should be able to look after their own pigs

LITTER SIZES HAVE CHANGED SINCE THE FIRST PENS FOR LOOSE-HOUSED SOWS WERE BUILT SOME YEARS AGO. BUT A NEW TYPE OF PEN WITH SUPPLEMENTARY NUTRITION SHOULD ENSURE THAT LOOSE-HOUSED SOWS CAN LOOK AFTER MORE OF THEIR OWN PIGS.



Since the first pens for loose-housed sows were established, a development in litter sizes has taken place. For many pig producers with loose-housing systems this means that more space is required together with an option for supplementary nutrition. SEGES Danish Pig Research Centre has therefore embarked on a collaboration with two housing systems manufacturers, Jyden and Vissing, to examine the opportunities for the further development of farrowing pens for loose-housed sows.

“The pens that are currently on the market are for sows with 12-14 pigs and have not been equipped with an appropriate milk cup system. In collaboration with housing system manufacturers, we’re working on developing a new type of pen where the focus is on the sow and her ability to look after up to 20 pigs. The objective is to reduce the need for nursing sows and ultimately to improve both survival and weaning weight. This is so that the pigs in

the early weaning section can perform better, have healthier intestines and have a reduced risk of weaning diarrhoea,” says Chief Scientist, Vivi Aarestrup Moustsen from SEGES Danish Pig Research Centre.

PIG PRODUCERS NOTICE A DIFFERENCE

So far, the work has resulted in a number of different prototypes which are currently being pilot tested by pig producers who already have pens for loose-housed sows. Among them is Jonas Würtz, who is particularly positive about one of the prototypes.

“One of the prototypes has not worked so well for us so far but we have managed to wean more pigs than normal in one of the other prototypes,” says Jonas Würtz.

DEVELOPMENT BACKED BY KNOWLEDGE

Although Danish pig production has a high global reputation, there is a need for

further development and for us to make our production even better in terms of sustainability, animal welfare and antibiotic consumption. The alternative is a risk that the industry will be subject to further pressure. This is why it is imperative that we make progress in new areas such as the development of pens for loose-housed sows. Albeit slightly caricatured, comparisons could be drawn with developments from the Stone Age to today.

“In the Stone Age, our ancestors did not stop using stones because they ran out of them. They stopped because of the developments taking place. Among the Danish pig production community – and among European pig producers for that matter – developments are also happening that the industry should follow in order to remain viable. This is with the proviso that animal welfare – particularly piglet survival – and our competitiveness are not compromised,” says Vivi Aarestrup Moustsen.

She is supported in her view by Jonas Würtz who has just agreed to try out new prototypes in order to contribute to the development of the future of Danish pig production:

“The pens we have today are excellent – but I can see that by making small adjustments and improvements we can become even better – and I want to be involved in this process,” says Jonas Würtz.



“The pens we have today are excellent – but I can see that by making small adjustments and improvements we can become even better – and I want to be involved in this process.”

Jonas Würtz, pig producer

Exciting new projects underway

EVERY YEAR, SEGES DANISH PIG RESEARCH CENTRE UNDERTAKES A NUMBER OF TRIALS WHICH LEAD TO NEW KNOWLEDGE – ALL FOR THE BENEFIT OF DANISH PIG PRODUCTION.

A substantial part of the costs of SEGES Danish Pig Research Centre are accounted for by innovation work. 2019 has contributed much new knowledge which will help you and your colleagues to make further improvements to your production. This year, 22 per cent of SEGES Danish Pig Research Centre's costs have gone to innovation.

INNOVATION IN 2020

We seek to remain at the forefront of research and are involved with projects that are important to you and your bottom line. In 2020, we will have a number of initiatives underway which will lead to higher health

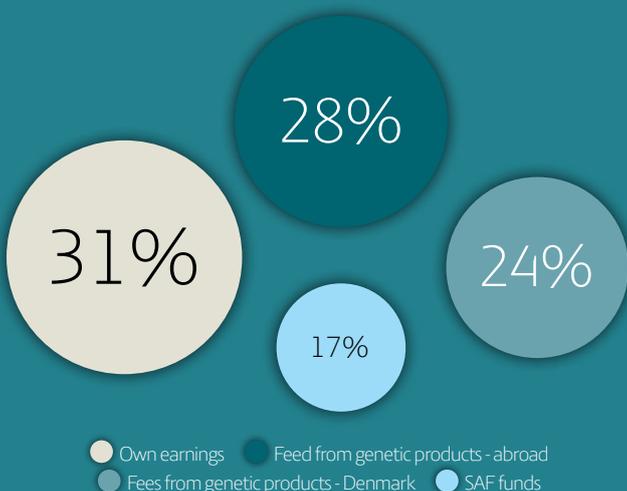
standards, even better animal welfare and a higher contribution margin – to mention just a few.

ALTHOUGH THE LIST IS LONG, THE FOLLOWING GIVES A FLAVOUR OF OUR NEW RESEARCH PROJECTS:

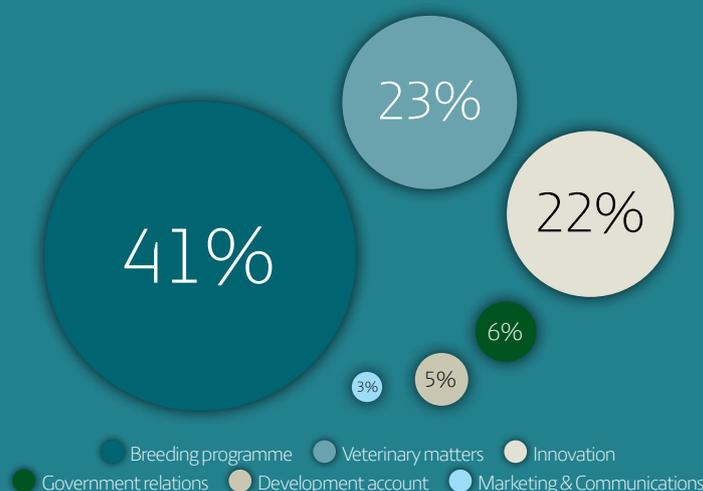
- > Feed for healthier sows with better nursing abilities
- > Tools for piglet survival
- > Prevention of hernia without antibiotics
- > Simple and effective methods to reduce pig housing emissions
- > Better gut health for piglets

In addition, there are, of course, a number of trials and initiatives that extend over a longer period and are already fully underway, i.e. feed strategies, alternatives to the therapeutic use of zinc, tools for better management and much more. We are looking forward to sharing our knowledge with you.

WHERE DOES THE MONEY COME FROM?



WHERE DOES THE MONEY GO TO?







We are where you are

SEGES Danish Pig Research Centre shares its latest results on a regular basis. You can always obtain a brief overview of our work through our news releases at pigresearchcentre.dk or on Facebook. And if you really want to get a thorough understanding of our scientific activities, our experts' publications are available for downloading.

In 2019 we started [segestv](http://segestv.seges.tv) where extended video clips feature both your colleagues and SEGES Danish Pig Research Centre's experts – often at pig farms where many of our trials take place.

If you would like to receive the latest news in your mailbox, you can subscribe to our weekly newsletter via pigresearchcentre.dk

In short: we are where you are!

FOLLOW US:

 pigresearchcentre.dk

 facebook.com/SegesSvineproduktion

 svin.seges.tv



Follow SEGES Danish Pig Research Centre:
facebook.com/segessvineproduktion