

# RESULTS 2021

SEGES DANISH PIG RESEARCH CENTRE

**Laboratory**  
New PCR machines  
analyse samples from pigs

**Ad libitum**  
can pay off

**Climate reduction**  
One target,  
several ways of  
getting there

# Welcome to Results 2021

The focus of SEGES Danish Pig Research Centre is to improve your business and its bottom line. In this year's Results, we cover how registering the cause of death can raise the piglet survival rate, the new digital tool for DANISH certification and how a so-called health wheel and a concept known as 'nudging' can ensure the correct handling of pigs.

Results also offers insights into how a new PCR machine has streamlined diagnoses at the Laboratory for Pig Diseases and into the work underway at DanBred which SEGES Danish Pig Research Centre is helping to develop.



06



22



16



24



32

## CONTENTS

- 04 > We will and we can
- 06 > New PCR machines analyse samples from pigs
- 08 > Ad libitum can pay off
- 10 > The foundation stones for even better longevity
- 12 > One target, several ways of getting there
- 14 > Fine-tuning piglet feeding
- 16 > Help with difficult decisions
- 18 > Long live the sow
- 20 > Eat up! More feeding points for more daily gain
- 22 > Registering the cause of piglet deaths
- 24 > Home-mixers, know your sieve profile
- 26 > Concept reduces weaning diarrhoea
- 28 > Easy access to documents  
- and fewer comments during audits
- 30 > Environmental technology: less methane emission
- 32 > Liquid feed for piglets increases daily gain
- 34 > Standing together

### FOLLOW US:

-  [pigresearchcentre.dk](http://pigresearchcentre.dk)
-  [facebook.com/segesgris](https://facebook.com/segesgris)
-  [gris.seges.tv](http://gris.seges.tv)
-  [podcast.seges.dk](http://podcast.seges.dk)

 **Svineafgiftsfonden**

Thank you to GUDP and the Pig Levy Fund for supporting a number of projects.



# We will and we can

There is great potential in Danish pig production. We aspire to do even better through innovation, development and enterprise.

Every year, SEGES Danish Pig Research Centre carries out research and trials, which have one primary aim: to ensure Danish pig production's position in the global elite in terms of animal welfare, low climate impact, meat quality and efficiency. 2021 has been no exception despite the global presence of Covid.

"Danish pig units have remained as active as ever. Irrespective of what has been going on in the world around us, we still need food on the table. We have a product that is in demand across the world – and we must ensure that this continues," says Erik Larsen, Chairman, Danish Agriculture and Food Council, Pig.

#### FROM BREEDING TO ZINC

We have achieved what we set out to do, but we can continue to develop and become better at making a product that many people want to have. It is no good having a good product if we do not deliver a sensible bottom line. Fortunately, we have an efficient

production which enables us to compete with other pig producing countries. Part of this can be attributed to breeding work and to SEGES Danish Pig Research Centre's innovation. To take two examples: new feed standards are being constantly revised to deliver the best possible financial results while new knowledge is helping to improve the piglet survival rate. That is to say, it benefits both animal welfare and the bottom line when as many pigs as possible are sent for slaughter.

"Everyone involved in Danish pig production puts in a great deal of effort on a daily basis to ensure that we live up to our reputation in Denmark and abroad. This work, combined with the latest knowledge, will help to secure our future. And that's already going well," says Erik Larsen.

#### INDUSTRY SHAPES THE FUTURE

The Board of Danish Agriculture and Food

Council, Pig, which comprises nine pig producers and one adviser, directs SEGES Danish Pig Research Centre's innovation work. As well as the Board, there is an Innovation Council comprising pig producers who are also involved in the work to decide which innovation projects should be launched. In other words, a great deal of preparatory work takes place before research into finding alternatives to medicinal zinc, other amino acid profiles or new environmental technologies gets underway.

"We're here for you, your farm and your future. Together we can ensure our continuous improvement and that in 20, 30 and 40 years from now we can compete with pig producers from countries that have other production conditions than we have in Denmark," says Erik Larsen.

**Thank you for all that you have done over the past year.**



# New PCR machines analyse samples from pigs

IN ORDER TO ENSURE THE EFFICIENT TREATMENT OF DISEASES ON FARMS AND THE HIGHEST STANDARD OF FOOD SAFETY, THE LABORATORY FOR PIG DISEASES IN KJELLERUP HAS A STRATEGY FOR PROVIDING A SMOOTH AND RAPID CASE PROCESS. IN ORDER FOR THIS TO HAPPEN, EFFICIENT ANALYSIS EQUIPMENT IS ESSENTIAL.



diarrhoea should be treated with antibiotics or prevented with vaccination. With a PCR analysis it is also possible to detect infectious intestinal disorder, swine dysentery, in pigs.

"The range of PCR analyses is constantly developing to ensure the best possible diagnostics. The bacterium that causes swine dysentery is difficult to detect by traditional methods. In this respect, PCR testing has proved to be a better alternative for detecting the bacterium in pigs," says Anne-Grete Hassing-Hvolgaard.

## PART OF THE SALMONELLA ACTION PLAN

In addition to PCR analyses, the laboratory also has an important role in relation to the Salmonella action plan. This is because meat juice from finishers is analysed at the laboratory.

"We are involved in the Salmonella action plan in that we analyse meat juice from finishers. This is used to identify Salmonella herds so that an appropriate action plan can be implemented to reduce the prevalence of Salmonella. In this way, the laboratory helps to ensure a high standard of food safety at Danish farms," says Anne-Grete Hassing-Hvolgaard.

Food safety facilitates the exports of Danish pig meat and is an important element in the action plan.

We have all got used to the acronym, PCR, over the past 18 months, but PCR analyses are not only used for analysing swabs for Covid tests. There are many PCR analyses of material from pigs that can provide the correct diagnosis and thus make the treatment process as accurate and fast as possible.

"Due to Covid-19, PCR machines have been on backorder for a year, but in the spring of 2021, we were able to upgrade our analysis apparatus with new PCR machines. This means that we can now expand our analysis offer and capacity for PCR tests for the benefit of pig producers," says Anne-Grete Hassing-Hvolgaard, Head of Department and Veterinarian specialising in

pigs at the Laboratory for Pig Diseases.

The new PCR machines mean that it is often possible to get the results from the samples within a few days. The new equipment has meant that the Bølgård testing station has the test results on the week's transferred pigs before the weekend so that the workflow at the testing station is optimised. It is important that prior to transfer, the pigs are tested negative for PRRS as Bølgård has been declared free from PRRS.

## RAPID CLARIFICATION

PCR machines are also used to analyse boot swab samples, i.e. manure samples. The test results are used to clarify whether



## FACT BOX – ANALYSED SAMPLES FROM THE LABORATORY FOR PIG DISEASES FROM JANUARY TO SEPTEMBER 2021

- > 26,000 analyses of autopsy samples, e.g. PCR analyses and resistance investigations.
- > 200,000 blood sample analyses for SPF diseases, including PRRS samples.
- > 100,000 meat juice samples analysed for Salmonella.

# Ad libitum can pay off

THE LATEST RESEARCH RESULTS FROM SEGES DANISH PIG RESEARCH CENTRE SHOW THAT AD LIBITUM FEEDING FROM TUBE FEEDERS CAN COMPETE WITH RESTRICTED FEEDING AND ALTERNATIVE FEED DISPENSERS. THIS IS PROBABLY BECAUSE GENETICS, HEALTH AND MANAGEMENT HAVE CHANGED IN RECENT YEARS.



In 2018, SEGES Danish Pig Research Centre carried out trials which showed that ad libitum feeding from tube feeders resulted in a lower production value compared to simple feed dispensers.

The lower production value arose because a too high feed intake resulted in a lower meat percentage and an inferior feed conversion. In purely financial terms, the higher daily gain had its benefits, but not enough to offset the financial losses from the two other factors.

The result was not surprising as the effects of high feed intake through ad libitum feeding were already established. Nevertheless, tube feeders are almost exclusively used in dry feed herds.

"Many finisher producers are pleased with the results of ad libitum feeding from their tube feeders. They offer a number of benefits such as easy cleaning and easy adjustment and the ad libitum feeding concept is easy for stockpersons to work with," says Senior Consultant Jesper Poulsen from SEGES Danish Pig Research Centre.

## GOOD NEWS FOR AD LIBITUM PRODUCERS

It is said that all good things come to those who wait. And although this may not always be true, this has proved to be the case with ad libitum feeding from tube feeders. SEGES Danish Pig Research Centre has conducted a trial where ad libitum feeding with tube feeders was tested against two methods of restricted feeding.

"In our recently completed trial, we tested three different feeding strategies: ad libitum in tube feeders, restricting feed intake by turning off the water in the feed dispenser and restricted feeding using special feed systems," says Jesper Poulsen:

"Surprisingly the trial showed that pigs which were fed ad libitum with access to water and feed round-the-clock, did rather well. The pigs' feed intake was higher but did not affect the meat percentage or feed conversion as we saw before," adds Poulsen.

## BREEDING, MANAGEMENT AND HEALTH

Why is ad libitum feeding paying off now? There is no definitive answer. However, Jesper Poulsen says that everything indicates that first and foremost, it can be attributed to a change in genetics, i.e. breeding progress which has been reflected in the production chain in recent years.

"As we've also seen in the national average, there have been great improvements in the production traits of finishers over the past few years. And in our recently completed trials we still see the same correlation between the amount of feed consumed and daily gain, meat percentage and feed conversion, but the negative effects on meat percentage and feed conversion have decreased. At the same time, the positive effect of daily gain has increased. All in all, ad libitum feeding delivers the best production value," says Jesper Poulsen.



Group	Ad lib	Restricted	Water in the feed dispenser turned off
Feed intake	3.18	2.80	2.99
Daily gain grams/day	1189	1067	1113
Feed conversion FU/pig/kg daily gain	2.68	2.63	2.69
Meat percentage	60.4	61.8	61.4
Production value per pen place (DKK)	1023	994	1002





# The foundation stones for even better longevity

SINCE 2019, SEGES DANISH PIG RESEARCH CENTRE, BREEDING & GENETICS HAS BEEN FOCUSED ON IMPROVING SOW LONGEVITY. THE RESULTS ARE ENCOURAGING.

Longevity has been part of the DanBred Landrace and DanBred Yorkshire breeding goals since 2006. This is a difficult trait to improve, however.

SEGES Danish Pig Research Centre, therefore, is now engaged in a new PhD project in collaboration with Aarhus University where solutions for improving breeding for longevity are being studied.

"So far we've been using a so-called indicator trait as a benchmark for improving longevity. But by using completely new data and models, we can accelerate genetic progress for longevity," says PhD student Bjarke Grove Poulsen, SEGES Danish Pig Research Centre.

Longevity is generally defined as the length of the productive life of a sow. As far as DanBred's breeding goals are concerned, longevity is defined as the likelihood of a sow coming into heat after weaning its first litter and functions as an indicator trait for the sow's reproductive lifetime. In production herds, longevity is the sow's ability to avoid being culled and thereby its ability to keep reproducing piglets.

An indicator trait for longevity is a trait that is genetically correlated with longevity: the stronger the correlation, the more genetic progress for longevity. The indicator trait is currently measured in multiplier herds, but as longevity is not quite the same trait in multiplier herds as in production herds, this has imposed some natural limits on genetic progress. However, this is what Bjarke Grove Poulsen's PhD project seeks to address.

#### FIGURES FROM PRODUCTION HERDS

One of the major changes is that data from production herds is being used, i.e. DanBred production herds. By using this data, Bjarke

Grove Poulsen and his colleagues from SEGES Danish Pig Research Centre and Aarhus University can obtain information to be used as a starting point for improving longevity.

"This provides scope for breeding directly for longevity in production herds. First and foremost, there is certainty in breeding for precisely what you are interested in. But it also means that it is easier to find the indicator traits that can support breeding for longevity. All in all, I firmly believe that the outcomes from the project will make a difference to both sows and producers," says Bjarke Grove Poulsen.

#### FACT BOX – STEP BY STEP

The first phase in the project is to use data from production herds to breed for longevity. The next phase is to establish how to account for the fact that the animals are crossbred instead of purebred. The third phase is to find a statistical method that can handle the fact that longevity is measured very late in the life of some sows. The fourth and final phase is to find traits in breeding and/or multiplier herds that can support breeding for longevity from production herds. The project is currently in its third phase.

## GENETIC PROGRESS

DanBred has a balanced breeding programme that ensures continuous genetic progress and efficient pig production. The DanBred breeding goals comprise the most economically important traits and the traits that contribute to the sustainable production of robust pigs.

The average genetic progress over the past three years is DKK 10.34 per year per produced finisher. Feed conversion, daily gain and lean meat percentage are the

traits that have made the most significant difference economically. Genetic progress in terms of Danish kroner is not as high as before. This is primarily due to the fact that over time, unfavourable genetic correlations have occurred between LG5 (number of live pigs in the litter five days after farrowing) and finisher traits which have not been there to the same extent as before.

"The unfavourable correlations between

LG5 and finisher traits mean that the reality in which we are currently making genetic progress is not the same as it was 5 years ago. We're working with biology and pigs are changing all the time in interaction with their local environment. Therefore, we're constantly changing the breeding goals and methods to ensure the best possible genetics," says Anders Vernersen, Head of Department, SEGES Danish Pig Research Centre, Breeding & Genetics.

Trait	LL	YY	DD	Average DLY - Finisher
LG5 (live pig day 5/litter)	0.23	0.10		0.16
Daily gain 30-118 kg (g/day)	21	21	19	20
Piglet daily gain birth-30 kg (g/day)	2.3	1.3	-0.9	0.4
Feed conversion (FUs/kg daily gain)	-0.040	-0.048	-0.035	-0.039
Longevity (proportion)	-0.03	-0.01		-0.02
Lean meat percentage (%)	0.24	0.18	0.12	0.17
Fertility & survival, farrowing effect (live pigs day 5/litter)			-0.04	-0.04
Conformation (score)	0.04	0.03	0.20	0.12
Slaughter loss (kg)	0.00	-0.04	-0.05	-0.04

The biological progress for all traits in DanBred's breeding goals for DanBred Landrace, DanBred Yorkshire, DanBred Duroc and for an average DLY finisher.

“ There are many alternatives to palm oil, e.g. rapeseed oil, soybean oil and fat. These have the same nutritional effect, but a lower climate footprint.

*Finn Udesen, Chief Consultant,  
Centre for Climate and Sustainability at  
SEGES Danish Pig Research Centre*

# One target, several ways of getting there

**THE JOURNEY TOWARDS CLIMATE NEUTRAL DANISH AGRICULTURE IN 2050 MAY SEEM A LONG ONE. BUT THERE ARE A NUMBER OF TOOLS THAT CAN BE USED TO PAVE THE WAY. MANY ARE ALREADY UNDERWAY.**

Danish pig production is far more efficient than pig production in many other countries that Denmark normally benchmarks itself with. This is largely due to breeding work and good management. And with efficient production comes a better bottom line and lower climate impact. Nevertheless, there is a wide range of measures that can further reduce climate footprint.

“The industry aims to be climate neutral by 2050. For many people, this may seem far into the future. But what is being done today is helping to pave the way towards the target. Consequently, Danish pig producers in 2021 should already be thinking about how to reduce their farm’s future climate footprint,” says Finn Udesen, Chief Consultant, Centre for Climate and Sustainability at SEGES.

#### **FEED WITH LESS CLIMATE FOOTPRINT**

Fortunately, there are many initiatives that can be tackled now, including feed composition.

Earlier this year, SEGES Danish Pig Research Centre launched a new feed component table, where the climate footprint of each component is provided.

“Feed composition is something that all farms should address. By entering current feed recipes and using the new feed component table, it is possible to see the climate footprint of the components,” explains Finn Udesen.

#### **ALTERNATIVE SOURCES OF NUTRITION**

Palm oil is a commonly used component. As it has a large climate footprint, it pays – purely for the sake of the climate – to switch to alternatives.

“There are many alternatives to palm oil, e.g. rapeseed oil, soybean oil and fat. These have the same nutritional effect, but a lower climate footprint. Our calculations based on current prices show that these alternative protein sources can be replaced without the

feed price immediately increasing,” says Finn Udesen.

Soy protein production is constantly being improved to lessen the climate footprint. But there are alternatives for this too: green protein, for example. Broad beans will be able to replace soybean meal in whole or in part, possibly combined with rapeseed cakes.

#### **NEW ENVIRONMENTAL TECHNOLOGIES**

In addition to feed composition, environmental technologies obviously have an impact on the number of climate gases that eventually exit pig housing units. Frequent discharge and slurry cooling are some of the technologies pig producers should consider further. Although weekly discharge requires more working hours, it is beneficial for the climate – see also page 30.

# Fine-tuning piglet feeding

**PIGLETS CAN ACHIEVE BETTER FEED CONVERSION AND THERE IS LESS RISK OF DIARRHOEA IF MORE FREE AMINO ACIDS ARE ADDED TO THEIR FEED.**

Tuning a motorcycle to run faster is illegal. However, this is not the case with piglet feed. Feed can be fine-tuned to achieve better feed conversion and lower incidents of diarrhoea. New ground-breaking results from SEGES Danish Pig Research Centre show that adding more free amino acids will achieve this.

"We know that the higher the protein level, the greater the risk that piglets will get diarrhoea. In our latest trial, we tested no fewer than 20 different combinations of protein and free amino acids to find precisely the perfect mix," explains Niels Morten Sloth, Chief Scientist at SEGES Danish Pig Research Centre.

The new trials has shown that it is possible to achieve the positive effect from proteins on daily gain and feed conversion, without increasing the risk of diarrhoea, by increasing the amount of free amino acids.

"With the latest results now available we can now show where the level should be to achieve maximum economic efficiency without compromising on health," says Niels Morten Sloth.

## **DIFFERENTIATED STANDARDS**

The new results have led to a change in the standards for piglet feeding, which means that there are now differentiated standards as there are for finishers. The standards that SEGES Danish Pig Research Centre continually

optimises are aimed at maximum production efficiency. In other words, the cost of the feed compared to the benefits from daily gain, feed consumption, etc.

"The latest revision of the standards means that we now have one protective diet, one standard and one for farms with a particularly good feed conversion. In testing, we also went to extremes and increased amino acids and protein. And although the number of diarrhoea treatments is low and the feed conversion good, it cannot pay off when compared to the cost of free amino acids," explains Niels Morten Sloth.

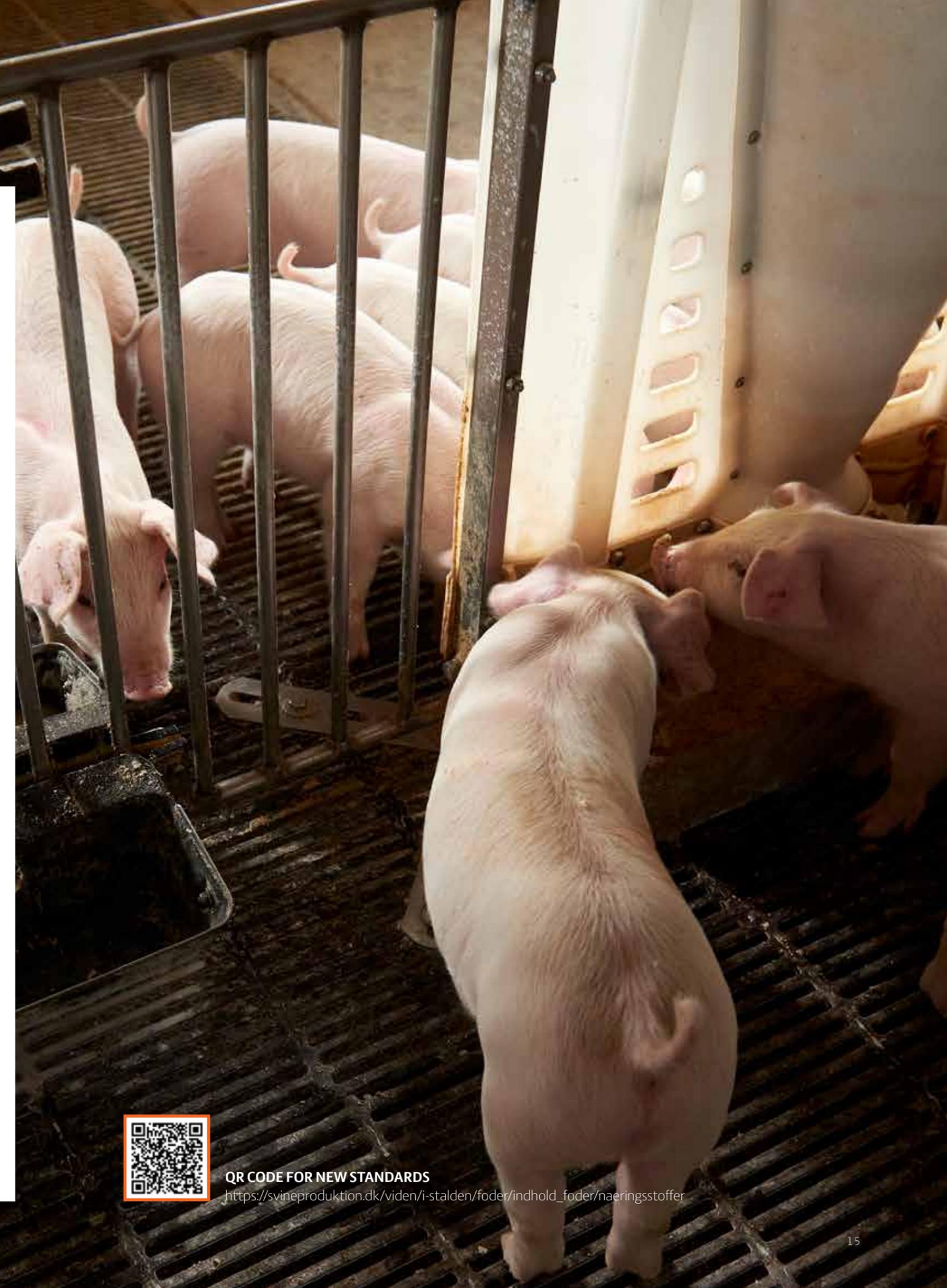
## **INCREASED MARGINS**

If the new standards are followed, calculations show that one can expect an increased

margin of between 1 and 2.5%. And this is particularly noticeable when the increased cost of greater amounts of amino acids has been taken into account.

The next step is to find out if it is possible to achieve the higher production value and improved health by using specific free amino acids.

"Once again, we will prepare a number of combinations of amino acids and protein, where we will start by testing lysine alone. This is the cheapest of the free amino acids so if the same results are seen just by using this, we will probably be able to achieve an even better margin. From there we will test the second cheapest amino acid and so on," explains Niels Morten Sloth.



**QR CODE FOR NEW STANDARDS**

[https://svineproduktion.dk/viden/i-stalden/foder/indhold\\_foder/naeringsstoffer](https://svineproduktion.dk/viden/i-stalden/foder/indhold_foder/naeringsstoffer)

# Help with difficult decisions



IT CAN BE DIFFICULT TO ASSESS WHETHER A SICK OR INJURED PIG SHOULD REMAIN WITH ITS PEN MATES, BE PUT INTO THE HOSPITAL PEN OR CULLED. A NEW TOOL PROVIDES ASSISTANCE.

Reprimands about not dealing with sick or injured pigs correctly are highly unwelcome. It is bad for both pigs and stockpersons if there are no checks on when a sick pig needs to go into a hospital pen or be culled. And although, over the years, there have been a number of information campaigns and initiatives, the issue continues to cause problems.

"Stockpersons only want to do the correct thing. They have the right intentions, but sometimes these fail to lead to action and objectives are not achieved. This is human and only natural. But we want to make it easier to do the right thing, which is why – over the past year – we've drawn on the principles known from behavioural design to solve this challenge," says Helle Pelant Lahrmann, who is responsible for the project.

## WHERE DO THINGS GO WRONG?

What is behavioural design? Jossi Steen-Knudsen from the iNudgeYou company explains:

"Changing people's behaviour involves taking different approaches, but the approach must fit the specific behavioural problem to have any effect. At the one end of the scale, there are information campaigns while orders and bans in the form of legislation are at the other. Most people would prefer to avoid the latter – including when it comes to sick or injured animals," he says.

Behavioural experts from iNudgeYou therefore visited a number of Danish pig units to find out where in the process things start going wrong.

"There are many things that come into play when we have to make decisions, e.g. our surroundings, the time of day and our personal preferences. This is why we have analysed the processes in the housing unit to find out what it is that causes sick and injured animals not always to be dealt with correctly," says Jossi Steen-Knudsen.

## DOING THE RIGHT THING

The work has resulted in the Health Wheel, which is a decision-making tool that can be used in the housing unit. If, for example, hernia is diagnosed, users can turn the Health Wheel to find out what action should be taken. The Health Wheel is a particularly good tool for teaching new farm workers and stockpersons. There is evidence to show that there is a significant difference between what a pig producer

thinks, what action his team takes and what happens in reality.

"If this topic is not included during training, some bad habits are passed on to new employees. We have also seen that the tool has created a good dialogue between the team because the instructions in the Health Wheel are quite specific. If instructions are not followed, therefore, this suddenly becomes a deliberate action whereas previously, it was not always clear what should be done and when. We humans have a tendency not to take action if we're in doubt about the right thing to do," explains Jossi Steen-Knudsen.

## Handy daily tool

New employees are not the only ones to benefit from the new tool. The first version of the Health Wheel has been tested by Morten Thorkilsen, a finisher producer in West Zealand. His employees used the Health Wheel for one month and although Yoliia Rymari, who works for Morten Thorkilsen, was initially sceptical she has

discovered that it has made some routines easier.

"I have several years of farm experience. But I have to admit that it helps us to make better and faster decisions in terms of judging whether a sick pig should go into the hospital pen or be culled," she says.

This is confirmed by Morten Thorkilsen, who also says that standards in general have been raised, which has given him more confidence in his daily work.

"We have a regular intake of new employees on our farms. The Wheel is good because it can help those who work at weekends. It's great for me to know that they have this tool when they're on their own," he says.



“ We have a regular intake of new employees on our farms. The Wheel is good because it can help those who work at weekends. It's great for me to know that they have this tool when they're on their own.

Morten Thorkilsen,  
Finisher producer

# Long live the sow

WITH THE LAUNCH OF THE SOLIV 2.0 CAMPAIGN, THE SPOTLIGHT IS ON RAISING THE DANISH SOW SURVIVAL RATE, WHICH ALSO BENEFITS THE BOTTOM LINE. WITH THE AIM OF SUPPORTING THE FARMER, COLLABORATION WITH ADVISORY OFFICES HAS GOT UNDERWAY AND A NEW REGISTRATION SYSTEM WILL SOON BE UP AND RUNNING TO ASSIST SOW PRODUCERS, VETERINARIANS AND ADVISERS TO IMPROVE THE SOW SURVIVAL RATE.

Some would say that the foundations of a good sow unit start – not surprisingly – with the sow. Work with sows is therefore an important element in maintaining a sustainable production, including good animal welfare and healthy profits. Unfortunately, recent years have seen a rise in the number of sows, young sows, finishers over approx. 120 kg and gilts sent to DAKA.

An increase in the survival rate can deliver a better contribution margin as shown in calculations from SEGES Danish Pig Research Centre. For every percentage point that sow mortality is reduced, up to DKK 50 per year sow can be earned. That is to say that in a herd of 1,000 year sows, with a sow mortality rate of 14%, the contribution margin will increase to DKK 250,000 per year by reducing sow mortality to 9%, which is the industry's target.

## COLLABORATION WITH ADVISERS TO INCREASE SURVIVAL RATE

In order to offer producers accessible and individual solutions, SEGES Danish Pig Research Centre has started collaborating

with six advisory offices across Denmark, with 30 farms participating in the sow survival project. Rasmus Andresen is an adviser with Svine-Rådgivningen (Danish Pig Advisory Centre) and is part of the collaboration.

"Our approach to the collaboration is based on the financial benefit gained from increasing the sow survival rate. In our experience, structure and routines can often be improved. But all sow producers find that it takes time to improve sow survival," he says.

## NEW TOOL FOR SOW SURVIVAL

In addition to the campaign and the collaboration with the advisory offices, a tool is currently being developed to help farmers form an overview of the causes of death. The tool comprises a complete report, including benchmarking, sent monthly for the adviser or veterinarian to analyse with the producer.

"The aim of a good diagnosis registration of dead sows is to focus on the key issues. The tool provides an overview of the cause of death as well as where in the sow's cycle and

age the problems are most significant. This enables the appropriate action to be taken with a view to increasing sow survival," says Senior Scientist Claus Hansen from SEGES Danish Pig Research Centre, the developer of the system.

## CAMPAIGN SINCE 2020

The SoLiv 2.0 campaign was launched in mid-2020 to share SEGES Danish Pig Research Centre's knowledge within the area and raise awareness of what is needed to increase sow survival. This includes a series of webinars covering various related topics, videos featuring advice on best practice from veterinarians and advisers as well as financial analysis and fact sheets. All the material is available at soliv.dk

"Our campaign is designed to help farmers raise the sow survival rate of their herds. It has been important to make our knowledge accessible as management and operational reasons can be at the root of a sow's death," says Tina Birk Jensen, Special Consultant and Veterinarian at SEGES Danish Pig Research Centre.



# Eat up!

## More feeding points for more daily gain

IT MAY WELL PAY OFF TO INSTALL ADDITIONAL FEEDING POINTS IN PIGLET PENS. DAILY GAIN INCREASES WHEN ACCESS TO FEED IS EASIER.

Are your piglets fed by tube feeders but failing to grow as you would wish? It may be that you need to give them more space when feeding.

"When many pigs share a feeding point, there is, of course, some competition at the feeders during periods of high feeding intensity. And even though the pigs get all they need, our trials have shown the effect of doubling the number of feeding points," says Dr. Helle Pelant Lahrmann, Team Leader, SEGES Danish Pig Research Centre.

### FROM 485 TO 514 GRAMS

If the current recommendations for the number of 'pigs per feeder' are followed, generally speaking all pigs get the feed they need. With the new results available, however, there is reason to increase the number of feeding points. Ultimately, a higher daily gain is synonymous with fewer days in the piglet unit and a better production flow.

"Our trial has shown that pigs in pens where we doubled the number of feeding points grew an average of 514 grams per day compared to 485 grams in pens with a single feeding point. This means savings on feed costs of approx. DKK 2 per pig, if we assume that

there is no more feed waste and that feed conversion is reduced due to higher daily gain," says Helle Pelant Lahrmann.

### MORE FEEDING POINTS IN ALL PENS

Pig producer Niels Aage Arve, who carried out a trial in one unit, will now install more feeding points in all his piglet pens. However, he will not double the number, as was the case in the trial, but only install 50% more.

"There were some practical challenges in terms of our particular unit. We're changing the set-up slightly so that the additional feeding points are integrated into the housing system. But of course, the money saved means we can do so without any major investment," he says.

In addition to the fact that more feeding points provide increased daily gain, Niels Aage Arve hopes that a less frantic feeding time will have a positive impact on tail biting.

"The purpose of the trial was originally to reduce the risk of tail biting. Unfortunately, this could not be proved. But, of course, we're keeping an eye on whether we can see a positive effect on that front," he says.

### AFTERNOONS NEED MONITORING

Although there have been good results from the trial, it is not certain that the results will be equally good for everyone. There are differences between herds and the effect of having an extra feeder per pen.

Helle Pelant Lahrmann recommends, therefore, that piglets need watching during the afternoon feed. A good indication as to whether the change is paying off is whether the pigs wait in line for the feeders in the afternoon when feeding intensity is at its highest.

"Piglets have a fixed circadian rhythm and the results from the trial indicate that pigs absorb less feed if they are unable to feed in periods when the desire to eat is high. In fact, we saw more pigs standing and feeding in pens where there were extra feeding points. Our advice, therefore, is to keep an eye on whether there is a queue at the feeder when doing your afternoon rounds," says Helle Pelant Lahrmann.

“ Piglets have a fixed circadian rhythm and the results from the trial indicate that pigs absorb less feed if they are unable to feed in periods when the desire to eat is high.

Helle Pelant Lahrmann, PhD and Team Leader, SEGES Danish Pig Research Centre





# Registering the cause of piglet deaths

BY REGISTERING THE CAUSE OF PIGLET DEATHS, PIG PRODUCERS, VETERINARIANS AND ADVISERS CAN OBTAIN A DETAILED OVERVIEW THANKS TO A NEW PROGRAMME.



Scientist Claus Hansen from SEGES Danish Pig Research Centre.

As an example, he mentions a farm where a large proportion of stillborns are connected to farrowing which ended on the Monday.

"When you look at the figures, you begin to think about the reasons. Are farrowings on the wrong days and should a change of day be considered? Are there too few stockpersons at work to assist the pigs or is there another reason? In other words, can this overview be used to produce specific solutions instead of just saying that more piglets need to be saved. Is there something to be gained from taking a specific course of action," says Claus Hansen.

## VETERINARY TOOL

The herd's veterinarian also receives the weekly overview. Gerben Hoorneborg, is a veterinarian with Porcus.

"I use the overview to continually keep an eye on piglet mortality at the farms I visit. It shows where they are and is useful for following up on why things have gone the way they have in a specific herd," he says.

The next step is to get some consistency in the causes of death. While more producers have started to register the correct cause of death, there are still some users who simply register the death of a pig.

"In order to make full use of the tool and benchmark the findings against the rest of the industry, we need more consistency in the registrations. Even so, this is a good tool for monitoring developments," he says.

Every Monday, pig producer Jesper Tambour receives an email with an updated overview of piglet mortality on his farm. The overview is so detailed that he can see the rate of piglet mortality from week to week and the reason for the deaths. The report is generated automatically based on data entered into Cloudfarm. SEGES Danish Pig Research Centre collects the data from Cloudfarm and makes it easily accessible from the pig producer's mailbox.

"I know the age of my pigs when they die and what they've died of. And I know which sow has nursed which piglet and I can also see which sows are not so good at looking after their piglets," he says.

## OUTCOMES

Increasing the piglet survival rate is a goal for the entire Danish pig industry. There are many initiatives underway at various farms. However, the successful initiatives are not always followed up on as when the calculations become available, the tendency is to focus on the number of mortalities – not the reason.

"By following developments week by week, you can see what effect your work has had. Not only does this provide an overview but it also provides an incentive to make the cause of death registrations even more detailed and so prevent piglet mortality," says Chief

"It's important that we can see the effects of the measures we take to increase the piglet survival rate. The weekly report we get from SEGES Danish Pig Research Centre means that we can constantly follow developments. And the graphs make it easier to see the weekly fluctuations," says Jesper Tambour.

He and his stockpersons register the dead piglets when they are removed from the pen.



“ It's important that we can see the effects of the measures we take to increase the piglet survival rate. The weekly report we get from SEGES Danish Pig Research Centre means that we can constantly follow developments.

Jesper Tambour, Pig producer



# Home-mixers, know your sieve profile

**TAKING A CLOSER LOOK AT SIEVE PROFILES CAN RESULT IN IMPROVED HEALTH FOR YOUR PIGS AND A HEALTHIER BOTTOM LINE. THE TYPE OF MILL AND SIEVE MAKES ALL THE DIFFERENCE.**

Between 60% and 80% of feed particles below 1 mm for growing animals and a maximum of 50% below 1 mm for sows. This has been the longstanding recommendation. There is some truth to this in that you are on reasonably safe grounds in terms of both feed efficiency and pig health.

A new trial from SEGES Danish Pig Research Centre, however, shows that the sieve profile depends on both the type of mill (impact mill v. disc mill) and the sieve method (volume or weight-based). The recommended sieve profile, therefore, depends on both these factors.

“We can now confirm that it is beneficial for home-mixers to take both these factors into account before they decide on which sieve profile they want,” says Tommy Nielsen, Specialist Technician at SEGES Danish Pig Research Centre.

## DIFFERENCE IN MILLS AND SIEVES

The background is that there is a difference in the way in which impact mills and disc mills grind. There is also a significant difference in the proportion of particles in a volume sieve and a sieve based on weight percentage. Based on the results from the trial, therefore, SEGES Danish Pig Research Centre has drawn up a new and more nuanced sieve profile which takes account of the two factors.

“I know that many pig producers don't exactly think that setting the feed mill and adjusting the sieve profile is the most exciting thing to do. But having said that, it has a significant impact on the bottom line,” says Tommy Nielsen.

## FINANCIAL BENEFITS

Growing animals need a certain proportion of finely ground feed because of its positive

effect on feed conversion. For sows and gilts, feed that has been ground too finely can have a negative effect. A certain amount of coarse feed is therefore recommended. Common to both growing animals and sows/gilts is that a balance should be found to suit the individual herd. A good starting point is the new, nuanced recommendations. If the right balance is struck, there are financial benefits to be had.

“You could almost say that it's money for nothing. Of course, it takes some time to make sieve profiles, but it doesn't take many minutes per week to make a profit. Our view is that there is often more money to be made per pig if you can achieve optimum grinding and the right sieve profile on your farm,” says Tommy Nielsen.

“ I know that many pig producers don't exactly think that setting the feed mill and adjusting the sieve profile is the most exciting thing to do. But having said that, it has a significant impact on the bottom line.

Tommy Nielsen, Specialist Technician, SEGES Danish Pig Research Centre

Type of animal	Type of mill	Particles under 1 mm	Particles under 1 mm Weight (2) per cent
Piglets and finishers	Impact mill	Min. 60%	Min. 60%
Sows and gilts	Impact mill	Max. 50%	Max. 50%
Piglets and finishers	Disc mill	Min. 60%	Min. 72%
Sows and gilts	Disc mill	Max. 50%	Max. 60%

1) E.g. Bygholm 2 feed sieve, where the particles are read on a scale before the percentage is calculated

2) E.g. Electric sieve and Skjold hand sieve, where the particles are weighed before the percentage is calculated. With the Bygholm 2 hand sieve, the particles can also be weighed instead of read.

# Concept reduces weaning diarrhoea

THREE SPECIFIC MEASURES IN THE WEANER UNIT CAN REDUCE THE PREVALENCE OF WEANING DIARRHOEA, NEW RESULTS SHOW.

"Almost five years ago, we introduced some alternatives to medicinal zinc. Some have worked while others had no effect on the prevalence of diarrhoea. But today, we produce exclusively without using medicinal zinc," says pig producer Lau L. Christiansen from Oure on the island of Funen in South-Central Denmark. He has been producing piglets without the use of medicinal zinc since 2017.

He recently participated in a trial from SEGES Danish Pig Research Centre where he was involved in the implementation of three specific measures to prevent weaning diarrhoea. Although his zinc-free weaning was already going well, the results were positive.

## EXPERIENCE GATHERING RESULTED IN THE CONCEPT

The measures, which were trialled in an overall concept, stem from SEGES Danish Pig Research Centre's experience gathering from 26 farms, which are already weaning without using medicinal zinc. In the experience gathering, 24 out of the 26 farms did something 'extra' in terms of feed and water post weaning. For example, some used gruel feed in troughs while others water in troughs. Some also deployed frequent floor feeding. In the concept test, gruel feed was

allocated 3-4 times per day in the farrowing unit up to weaning. Specific emphasis was given to protein level and source in the weaning feed and the mixing of litters during weaning was kept to a minimum.

"The three measures from the concept are definitely a good place to start. They can be combined with some of the other results that we have found from other trials. But there is a significant difference in farms around the country," says Tina Sørensen, Senior Consultant, SEGES Danish Pig Research Centre, who is aided by veterinarian and Head of Department at SEGES Danish Pig Research Centre, Nicolai Rosager Weber:

"We have some tools that we know have an effect, but how many will come into play and how they should be combined depends on the individual farm. Producers should therefore start trying things out now to be prepared for June next year when medicinal zinc will be a thing of the past," he says.

## THE CLOCK IS TICKING ...

Lau L. Christiansen's participation in the trial has only been positive.

"I tested things on a large scale that I would never have started on my own. I hope that

the experience from my farm will help others to begin weaning without using medicinal zinc when the ban comes into force next year," he says and points out that no one solution suits everyone.

"We have a handbook for what works on my farm. But there's a big difference between what works in different places. It 100% depends on the farm, the pigs and the stockpersons. That's why I'm keen to point out why it's important to get started now," he says.

The result from the concept trial at Lau L. Christiansen's farm is good news for Danish piglet producers in that there has been a clear effect on the number of diarrhoea treatments. In other words, the three-measure concept can be part of the solution to reduce weaning diarrhoea without using medicinal zinc.

"There's nothing to suggest that we'll find a solution that has exactly the same effect on reducing weaning diarrhoea as medicinal zinc. But with this concept we can come a big step closer to a zinc-free daily life without compromising on the use of antibiotics," says Tina Sørensen.



## THREE INITIATIVES FOR REDUCING WEANING DIARRHOEA

- > Allocation of gruel feed 3-4 times per day both before and after weaning.
- > Allocation of weaning feed with the emphasis on protein level and source.
- > Less mixing of litters when weaning.

“ I tested things on a large scale that I would never have started on my own. I hope that the experience from my farm will help others to begin weaning without using medicinal zinc when the ban comes into force next year.

Lau L. Christiansen, Pig producer from Oure



# Easy access to documents

## - and fewer comments during audits

**IMAGINE A WORLD WHERE ALL THE PAPERS YOU NEED FOR VISITS FROM THE AUTHORITIES, OR THE DANISH CERTIFICATION BODY, CAN BE FOUND IN ONE PLACE. THIS IS NOW POSSIBLE WITH THE DANISH BOX; A FREE TOOL WHICH COLLATES EVERYTHING FROM SELF-AUDITS TO TAIL BITING RISK ASSESSMENTS.**

Pig producers and stockpersons have a duty to keep good administrative order in addition to looking after their pigs. A large number of tasks and procedures require follow up – all of which are examined when a DANISH certificate comes to be renewed or an audit is conducted.

"By far the majority of pig producers do what is required to comply with legislation and the industry's own regulations. However, the necessary documents are not always

to hand when a visit occurs – which is a pity, especially when everything else has been done according to the rules. We have therefore developed a document management tool," says Niels-Peder Nielsen, Chief Consultant at SEGES Danish Pig Research Centre.

### EVERYTHING IN ONE PLACE

The DANISH Box is the name of the system that is intended to provide Danish pig producers with a much more manageable overview of the farm's key documents,

including course certificates and risk assessments for tail biting, etc.

"It's not unusual for many farms to have rows of ring binders containing new and old registrations and documents," says Asger Kjær Nielsen, DANISH Quality Manager.

"The DANISH Box is intended to make it easier for producers to gather together all documentation required for DANISH certification. The documents are also easily

accessible for when official audits are carried out. It gives producers peace of mind and provides for a constructive visit. They can be certain that all the relevant documents are to hand, and they are up to date in terms of the regulations. One of the benefits of the system is that it reminds producers when existing documents need to be updated or new ones uploaded," adds Asger Kjær Nielsen.

### GET STARTED – IT'S FREE

The DANISH Box was developed by SEGES Danish Pig Research Centre in close collaboration with a number of pig producers.

"We interviewed Danish pig producers to determine what they require to ease their daily workload and get the relevant workflows underway both for DANISH certification and official audits. Over the summer, we also trialled the system with a large group of producers," says Niels-Peder Nielsen.

One of them is pig producer Hans-Christian Dahl from Cathrineholm. Now that he has

familiarised himself with the system and uploaded the initial documents, he can see the potential in the DANISH box:

"It took a little time to get going. But that was largely because of my own mess. I had documents in folders and in different files on my computer – and it took time to enter them all into the system," he says.

### EASIER IN FUTURE

But all this can only become easier as time goes on:

"Now that I've got started, everything looks easier and more systematised. And when the next version of the DANISH box arrives, I will receive notifications about when it's time to upload new documents. More of the key documents are now also available in digital versions and can be entered into the programme straight away. Hopefully, this will enable me to avoid a terrible three days prior to the audit," he says.



“ The DANISH Box is intended to make it easier for producers to gather together all documentation required for DANISH certification. The documents are also easily accessible for when official audits are carried out.

*Asger Kjær Nielsen,  
DANISH Quality Manager*

# ENVIRONMENTAL TECHNOLOGY: less methane emissions

**ENVIRONMENTAL TECHNOLOGIES ARE CRUCIAL IN THE WORK TO REDUCE CARBON EMISSIONS FROM DANISH PIG FARMS. REGULAR DISCHARGE IS A GOOD PLACE FOR FINISHER PRODUCERS TO START. BUT THIS SHOULD BE DONE ON A WEEKLY BASIS TO ACHIEVE THE GREATEST EFFECT, A NEW TRIAL SHOWS.**

New environmental technologies are constantly coming on stream and existing technologies are continually being refined. One of the well-established technologies is regular discharge which is practised by many Danish finisher producers today. But how often should this be carried out to achieve maximum effect? A new trial has found the answer.

“Frequent discharge is already being carried out at many farms. In our most recent full-scale trial, we examined the effect of discharging every week and every other week – and there are notable differences,” says Malene Jørgensen, external consultant at SEGES Danish Pig Research Centre.

#### **DOUBLING THE EFFECT**

The trial has shown that there is a significantly greater effect on methane emissions by discharging every week instead of every other.

“Regular discharge reduces methane. Discharge every other week results in a 16% reduction compared to discharging twice during a batch of finishers. By comparison, weekly discharge results in a methane reduction of no less than 35% compared to twice over the growth period,” says Malene Jørgensen.

Weekly discharge can also reduce odour by 20% in units with fully drained floors.

#### **MORE WORKING HOURS BUT ...**

Discharging should be carried out every week to have a real effect on methane emissions. Methane is all-important as regards the efforts to make Danish agriculture climate neutral by 2050.

“Methane is a greenhouse gas that is approximately 25 times more powerful than CO<sub>2</sub>, and is formed, among other things, in slurry, especially when slurry is stored at a high temperature in a pig housing unit for example. It is therefore important to discharge the slurry into a slurry container on a regular basis where, on average, the temperature is lower,” says Michael Holm, Team Leader SEGES Danish Pig Research Centre.

It is therefore recommended that a plan for weekly discharging is drawn up to ensure that it is carried out – even if this involves extra work.

“The time spent on weekly discharging will mean increased costs of DKK 1-2 per pig. It’s never popular to recommend something that impacts the bottom line. But the pressure to lower agriculture’s greenhouse

gas emissions is not going to ease,” says Michael Holm.

#### **WINCH-DRIVEN CLEANING SYSTEM**

If an even greater reduction in the emission of greenhouse gas and odour is to be achieved, a winch-driven cleaning system could be considered. This was used in housing units in the 1980s and perhaps it could be integrated into new builds.

Whereas weekly slurry discharge can reduce methane emissions but has less effect on odour, a winch-driven cleaning system can reduce methane emissions and odour further as the slurry is discharged daily.

“Earlier this year, we measured the effect of the winch-driven cleaning system on methane and odour. This showed that methane emissions from pig units can be reduced by 70% and odour by 40%. Less odour from pig housing is a key parameter in environmental approval of new builds. Such environmental technology should be considered in such cases – as soon as the winch-driven cleaning system is included on the Danish Environmental Protection Agency’s Technology List,” says Michael Holm.

“The trial has shown that there is a significantly greater effect on methane emissions by discharging every week instead of every other.

*Malene Jørgensen,  
External consultant,  
SEGES Danish Pig Research Centre*

# Liquid feed for piglets increases daily gain

THE CHOICE OF FEEDING STRATEGY FOR PIGLETS HAS BEEN SHOWN TO BE OF GREAT IMPORTANCE TO THEIR FINAL WEIGHT, REGARDLESS OF WHETHER THE WEANING AGE IS FOUR OR FIVE WEEKS. THIS HAS BEEN SHOWN IN A TRIAL WHOSE ORIGINAL PURPOSE WAS TO STUDY WHETHER WEANING DIARRHOEA WAS AFFECTED BY FEEDING STRATEGY AND WEANING AGE.

Better daily gain is important for a pig producer's economy. So far, however, it has been difficult to get piglets to eat more feed in the farrowing unit. A new trial has therefore examined whether supplementary feed can affect a piglet's development to the extent that it can be transferred to the weaner unit – a long-standing topic for discussion.

In the trial, piglets in one herd were offered supplementary feed in the form of liquid feed or dry feed from day 9 after farrowing. The liquid feed was dispensed by means of a mini liquid feed system from BroPil while the dry feed was given by hand in small quantities on a frequent basis. In addition, the pigs were weaned at either the fourth or fifth week. Daily gain was monitored in the farrowing unit and until the pigs were nine weeks old.

## GOOD RESULTS FROM LIQUID FEED

Both the feeding strategy and the weaning age affected the piglets' daily gain. Not surprisingly, the weaning weight was higher when weaned one week later. This resulted in both higher daily gain in the farrowing unit and in the weaner unit at five weeks. Pigs that had been given liquid feed had a higher weaning weight at both 4 and 5 weeks of weaning age and higher daily gain in the farrowing unit and weaner unit. See table.

Even though the pigs were weaned at a higher age, it had a greater effect whether

they were given liquid feed instead of dry feed than when they were weaned. This was established when the pigs' final weight was registered in the ninth week.

"It was surprising that liquid feed produced the most significant effect. A final weight of approx. 1 kg more at nine weeks with liquid feed is a significant difference between the two feeding strategies in the farrowing unit," says Niels J. Kjeldsen, Head of Department, SEGES Danish Pig Research Centre.

## SUCCESS WITH FEED MIXTURE WITHOUT ZINC

The trial's original purpose was to examine whether weaning diarrhoea was affected by the feeding strategy and weaning age. Although the farm did not use zinc in the piglet feed there were very few treatments

for diarrhoea and no conclusions could be drawn. With both dry feed and liquid feed, the farm succeeded in maintaining a very low level of weaning diarrhoea.

"The few treatments for weaning diarrhoea may be due to the fact that it was possible to dispense higher quantities of dry and liquid feed to piglets. The pigs were allocated 750 g liquid feed in the farrowing unit at 4 weeks weaning age. This is significantly higher than in another trial with the same type of mini liquid feeding system," explains Marie Louise M. Pedersen, Special Consultant, SEGES Danish Pig Research Centre. "But more interesting is the fact that the pigs attained approximately the same quantity of feed in the litters allocated dry feed. Here they were allocated 790g in the farrowing unit, which is new compared to previous trials.

Weaning age	4 weeks	4 weeks	4 weeks	5 weeks	Dry/ liquid	4/5 weeks
Feed type	Dry	Liquid	Dry	Liquid	p	p
<b>Farrowing unit</b>						
Weaning weight, kg	6.15	6.37	7.78	8.10	***	***
Daily gain farrowing unit, g	215	225	222	232	***	**
<b>Pigs</b>						
Final weight at 9 weeks, kg	22.0	23.2	22.6	23.7	***	*
<b>From start to 9 weeks</b>						
Total daily gain, kg	20.4	21.6	20.9	22.0	***	**
Total daily gain, g	341	361	349	368	***	**



“ It was surprising that liquid feed produced the most significant effect. A final weight of approx. 1 kg more at nine weeks with liquid feed is a significant difference between the two feeding strategies in the farrowing unit.

Niels J. Kjeldsen,  
Head of Department, SEGES Danish Pig Research Centre

# STANDING TOGETHER

DANISH PIG PRODUCTION HAS BECOME WHAT IT IS TODAY BECAUSE WE HAVE REMAINED UNITED FOR THE PAST 150 YEARS. IF WE CONTINUE IN THIS WAY, WE WILL ALSO BE HERE FOR THE NEXT 150 YEARS.

The Danish agricultural community has stood together since the end of the 19th century. Even though rapid developments have taken place since the first cooperative movements were established, ideologies and a spirit of unity have made production what it is today.

"We have been able to develop our production because of the foundation upon which the co-operative concept is built. We stand together in the good times and the bad, and with a common purpose: to have an up-to-date and efficient pig production now and in the future," says Christian Fink Hansen, Sector Director for SEGES Danish Pig Research Centre.

"For many companies, it's all about delivering profits for the next set of accounts. In our sector, we have to drive developments that enable subsequent generations to inherit

their family farm and carry on the business," he says.

## INNOVATION IS THE KEY

We need to remain on the front foot when competing with countries that have significantly lower costs and do not put the same emphasis on having a low medicine consumption as we do in Denmark where we are focused on animal welfare, the environment and the climate.

This is also precisely why, every year, we invest in innovation in Danish pig production, including in the ongoing development of breeding work, the updating of feeding strategies based on the latest knowledge and the development of new technologies, which all make a difference to the bottom line. And then there is our lower climate impact and a better end

product – all of which are important in Denmark and to the countries we export to.

"Our InterPig partnership means that every year, we receive productivity figures from a number of other countries we benchmark ourselves with. Time and again, Denmark is low when it comes to the cost of production. That's great, but this can only be achieved through collaboration," says Christian Fink Hansen.

## FOLLOW US:

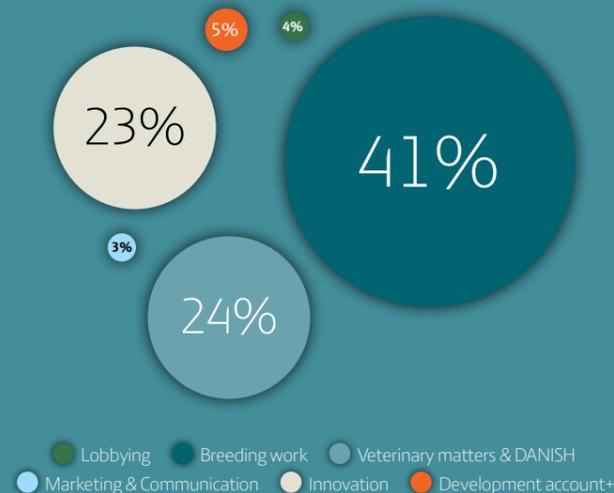
 [pigresearchcentre.dk](http://pigresearchcentre.dk)

 [gris.seges.tv](http://gris.seges.tv)

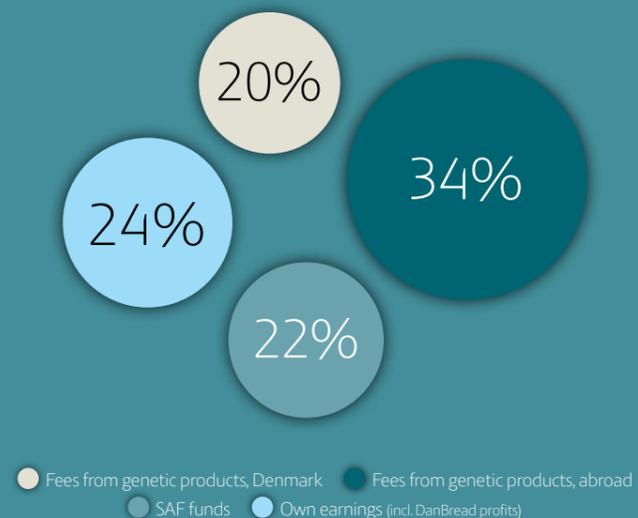
 [facebook.com/segesgris](https://facebook.com/segesgris)

 [podcast.seges.dk](http://podcast.seges.dk)

## HOW WE USE OUR FUNDING



## WHERE DOES OUR FUNDING COME FROM





Follow SEGES Danish Pig Research Centre:  
[facebook.com/segesgris](https://facebook.com/segesgris)