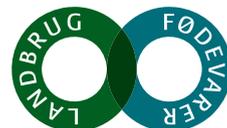


Feeding trials



Pig Research Centre offers a wide range of feeding trials. Companies wishing to have their products tested will find answers to frequently asked questions relating to the way feeding trials are conducted.

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Introduction

The supply of feed additives is constantly increasing, and pig producers, advisors, and feed mills require impartial documentation to ensure that they get their money's worth when investing in and using these products. However, documentation of their effect is often sparse. Pig Research Centre therefore offers companies to have their products tested in a reliable, quick and cost-effective manner. It is also possible for feed mills to have a feed mix tested.

The Department for Nutrition and Reproduction is responsible for all feed-related activities under Pig Research Centre. We have one experimental station, Grønhøj, as well as contact to a number of pig production farms (trial hosts) where feeding trials can be conducted.

Companies wishing to have a product tested that is **not** approved in the EU for the animals in question must forward appropriate product information to the Danish Plant Directorate. A trial cannot start before this approval has been obtained from the Danish Plant Directorate.

Production of trial feed

All trial diets are produced at a commercial feed mill.

Production of trial feed is normally supervised by an experienced representative from Pig Research Centre to ensure correct inclusion of the products and to check that mixtures are labelled correctly. His primary task is to ensure that all procedures relating to the production of the feed are followed. He also coordinates the entire process until the feed is delivered at the experimental station/pig farm.

Analyses

Only analytical methods approved in the EU or nationally in Denmark can be used to analyse the content of various nutrients as well as the correct inclusion rate of a product. If no approved method is available to analyse a given product, the following solutions can be used to document that a product is included in the correct rate:

1. A representative from the company supplying the product for the trial is present when the feed is produced and monitors the manual weighing and inclusion of the product.
2. A premix is made containing the product as well as a tracer substance ("Micro-Tracer"). This tracer can be used for both qualitative and quantitative analyses of the product. Quantitative analysis requires increased inclusion of the tracer - the analytical variation is $\pm 20\%$. All costs related to the use of a tracer are paid by the company.

Statistical analyses

All feeding trials conducted by Pig Research Centre are designed to have a statistical power of at least 80. Statistically significant differences are indicated at a five per cent level ($p < 0.05$). Data is subjected to an analysis of variance, and levels of significance (p-values) are corrected for multiple comparisons in a Bonferroni t-test. The trials are designed to detect a difference in production value of 10%.

In all trials, the results achieved for the different parameters (feed intake, feed conversion ratio, daily gain, and, for finishers, lean meat percentage) are summarised into one value: a production value. This reduces the number of tests in the statistical analysis, thereby reducing the factor used in the Bonferroni adjustment of the obtained p-values. Furthermore, the overall economic effect of a product, ie. the production value, is of greater interest to the pig producer than individual performance parameters.

The statistical procedures and principles for data processing are established before a trial starts and are described, if required, in detail in the trial protocol.

Trials in the climate labs are designed according to the expectation to the products tested.

Equal performance trials

Many products are expected to improve the performance of the pigs when added to a diet identical to the control diet. For some products, however, it may be more appropriate to formulate a negative control diet, add the product, and then compare performance against a positive control diet and a negative control diet. Thus, all equal performance trials must include a negative control treatment. All costs associated with a negative control treatment are paid by the company.

Digestibility and balance trials

In combination with a product trial in which production performance results are the primary parameters, it is also possible to conduct digestibility and/or balance trials. The same feed is used for production performance trials as for digestibility/balance trials. Production performance data can thus be compared with digestibility data and consequently provide further knowledge about the effect of a product.

Digestibility and balance trials are arranged with the Faculty of Agricultural Sciences, Aarhus University. The company will pay for these trials.

Publication

Results from all product trials are published in Danish in a trial report on our web site www.vsp.lf.dk.

Prior to publication, the parties participating in the trial will receive a draft copy of the final report for review. However, Pig Research Centre is responsible for the interpretation of the results and the final wording of the report.

The trial report is also published in English if the trial involves participation of foreign companies.

Ownership of data

All basic data collected during a trial remains the property of Pig Research Centre and will not be distributed. This is to avoid publication of more than one statistical analysis and varying interpretations of the same set of data. All companies participating in trials are, however, welcome to follow the statistical processing and, if necessary, have specific details elaborated.

Option for non-publication

If requested, the results from a trial can be withheld from publication or they can be published at a later date. In such cases, this is specified in the agreement (signed by both parties) prior to trial start, and will double the price of the trial.

Trial facilities – Experimental Station Grønhøj

The trials are normally conducted at Pig Research Centre's experimental station "Grønhøj". In general, all work and management routines are identical to those of any other commercial farm. At Grønhøj, skilled staff is employed to help implement the trials and the facilities are fitted with additional equipment (silos, feeding systems, etc.).

Whenever it is not possible for Pig Research Centre's experimental station to comply with special requirements related to the design of a trial, it will often be possible to recruit suitable commercial farms from the large number of trial hosts known to Pig Research Centre. An example of such requirements could be testing of a product measuring the effect on the frequency of diarrhoea or mortality; or the testing of a product for several groups of animals (weaners + finishers or sows + piglets etc.) simultaneously or consecutively.

Trial protocol

All trials are conducted in accordance with the guidelines stated in the trial protocol for each trial, which is prepared prior to the start of the trial. All feeding trials with finishers are conducted in accordance with the same fundamental guidelines, but the number of animals, groups and replicates involved may vary from one trial to another.

General trial set-up at an experimental station

Description:	A maximum of five companies participate in each trial round. The effect of each product is compared with a neutral control group. Trials follow a fixed trial design, with a limited possibility of incorporating special requirements, such as additional feeding and weighing, extra analyses, etc. It is possible to buy more than one group per trial round.
Primary parameters:	Production value / place unit / year.
Statistics:	In most cases, a difference in production value / place unit / year can be tested as statistically significant when the difference is equal to approximately 0.1 FUgp per kg of gain and approximately 30 g of daily gain.
Duration:	Approximately eight months from the start of the trial and until a trial report is published.

Description of trial facilities at Grønhøj

Weaners (8-30 kg, weaned at 4 or 5 weeks)

Weaner units – small pens

Description:	Each pen measures 1.40 m x 2.95 m = 4.10 m ² . Four sections; 18 pens/section and 11 pigs/pen. Each pen has one drinking bowl and one feeder. Slatted floors cover one half of the pen, and solid floor the other half. There is a covered area at the back of the pen.
Capacity:	Max. six treatments (groups) at a time. Two diets are fed in each group: a starter diet from 4 to 6 weeks of age and a weaner diet from approx. 6 to 11 weeks of age.

Weaner units – large pens

Description:	Each pen measures 1.40 m x 3.56 m = 4.98 m ² . Four sections; 12 pens/section and 16 pigs/pen. Each pen has one drinking bowl and one feeder. Slatted floor covers 40% of the pen and solid floor the remaining 60%. There is a covered area at the back of the pen.
Capacity:	Max. six treatments (groups) at a time. Two diets are fed in each group: a starter diet from 4 to 6 weeks of age and a weaner diet from approx. 6 to 11 weeks of age.

Finishers (30-100 kg)

Finisher unit

Description:	Each pen measures 4.35 m x 1.53 m. Ten sections; 18 pens/section and nine pigs/pen (0.67 m ² per pig). Each pen has one feeder and one nipple drinker in the feeder, and one additional nipple drinker in the pen. All pens have drained and slatted floor.
Capacity:	Max. nine treatments (groups) at a time.

Climate labs at Grønhøj (finishers, 30-100 kg)

Description:	Each pen measures 2.40 m x 4.80 m. Three sections and six chambers per section; two pens per chamber and 16 pigs/pen (0.70 m ² per pig). Each pen is equipped with one feeder and one drinking bowl. Each pen has 1/3 drained floor and 2/3 slatted floor.
Capacity:	Max. six treatments (groups) at a time. The climate labs are used for environmental trials and we can measure odour, ammonia and CO ₂ emissions from the chambers.

Sows

Product trials with sows are normally conducted on commercial farms – as opposed to trials with weaners or finishers. It is therefore not possible to provide detailed information about trial facilities or prices, as they vary from trial to trial.

Dry sows

Description:	The product is administered in the period from weaning until service.
Primary parameters:	Percentage of sows to be mated within seven days, farrowing rate, litter size.
Statistics:	With 1000 sows per group, the following differences between trial and control can be tested as statistically significant: <ul style="list-style-type: none">• 8 percentage points for sows mated within seven days• 8 percentage points for farrowing rate• 0.5 piglets for litter size
Duration:	Trials on two farms: approximately 12-18 months.

Gestating sows

Description:	The product is administered in the period from weaning until five days prior to farrowing
Primary parameters:	Litter size, farrowing rate (M.M.A. and stillborn pigs)
Statistics:	With 1000 sows per group, the following differences between trial and control can be tested as statistically significant: <ul style="list-style-type: none">• 0.5 piglets for litter size• 8 percentage points for farrowing rate• 8 percentage points for M.M.A.• 0.3 stillborn piglets per litter
Duration:	Trials on two farms: approximately 12-18 months

Farrowing sows

Description:	The product is administered in the period from five days prior to farrowing and until farrowing
Primary parameters:	Stillborn piglets per litter, percentage of treatments for M.M.A., birth weight
Statistics:	With 1000 sows per group, the following differences between trial and control can be tested as statistically significant: <ul style="list-style-type: none">• 0.3 stillborn piglets per litter• 8 percentage points for treatment for M.M.A.• 0.1 kg of birth weight per pig
Duration:	Trials on two farms: approximately 12 months

Nursing sows

Description:	The product is administered in the period from five days prior to farrowing and until weaning.
Primary parameters:	Stillborn piglets per litter, percentage of treatments for M.M.A., treatment frequency of litter, weaned pigs per litter, weaning weight.
Statistics:	With 1000 sows per group, the following differences between trial and control can be tested as statistically significant: <ul style="list-style-type: none">• 0.3 stillborn piglets per litter• 8 percentage points for treatment for M.M.A.• 8 percentage points in percentage of treated litters• 0.3 pigs weaned per litter• 0.25 kg in weaner weight per pig
Duration:	Trials on two farms: approximately 12 months.

Prices / contract

Prices

Weaners: DKK 100,000 – standard, Grønhøj, one group.

Finishers: DKK 100,000 – standard, Grønhøj, one group.

Climate lab: The price is calculated according to the actual costs.

Sows: The price is calculated according to the actual costs.

In addition to the basic price for a trial, supplementary charges can be imposed relating to

- Special requirements (additional analysis, weighing of pigs, etc.)
- Option for non-publication: Basic price + 100 per cent
- Equal performance trials: Negative control treatment

Payment

The price of a trial must be agreed upon and paid prior to the start of the trial.

Contract

In the planning stages, a written agreement is drawn up laying down all significant conditions relating to the trial in question. For this purpose, Pig Research Centre applies a standard agreement adapted to the conditions of each trial.