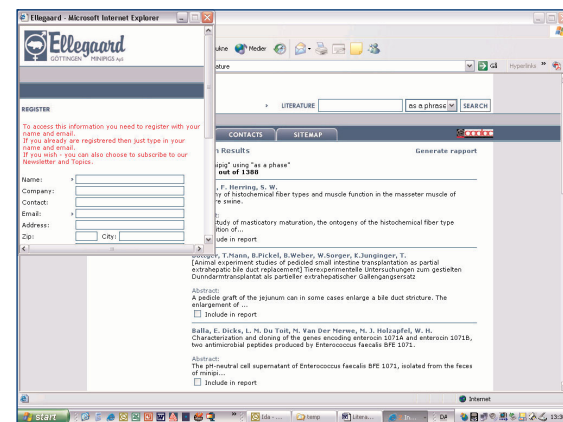


corner of the homepage. When the search results appear, as shown below, the abstracts of interest should be ticked off in the "include in report" box. Browsing through the search results, it is possible to move back and forth through the results by pressing the phrase "next 10 results" or "previous 10 results". When the abstracts of interest have been ticked off, press the phrase "Generate report" in the top right corner of the page with search results. A window will appear, asking, "Do you wish to include abstracts?" Press OK or Cancel.



When OK is pressed, a window will appear telling you that in order to access this information you need to register with your name and email. After registering, the full abstract is made available on the screen.



**New articles about Göttingen Minipigs**  
Dalmose, A. L., Bjarkam, C. R., Sorensen, J. C., Djurhuus, J. C., Jorgensen, T. M., 2004, "Effects of high frequency deep brain stimulation on urine storage and voiding function in conscious minipigs", *NeuroUrol Urodyn*, 23, (3), pp. 265-72.

Larsen, M., Bjarkam, C. R., Ostergaard, K., West, M. J., Sorensen, J. C., 2004, "The anatomy of the porcine subthalamic nucleus evaluated with immunohistochemistry and design-based stereology", *Anat Embryol*, 208, (3), pp. 239-47

Anzenbacherová, E., Anzenbacher, P., Svoboda, Z.,

Ulrichová, J., Květina, J., Zoulová, J., Perlík, F., Martínková, J., 2003, "Minipig as a model for drug metabolism in man: comparison of in vitro and in vivo metabolism of propafenone", *Biomed. Papers*, 147, (2), pp. 155-159

Larsen, L.F., Olsen, A. K., Hansen, A. K., Bukhave, K., Marckmann, P., 2003, "Feeding minipigs fish oil for four weeks lowers postprandial triacylglycerolemia", *J. Nutr.*, 133, pp- 2273-2276

Seif, C., Cherwon, E., Martinez Portilló, F.J., Jünemann, K.P., Braun, P.M., 2003, "Improved sacral neuromodulation in the treatment of the hyperactive detrusor: signal modification in an animal model", *BJU International*, 91, (7), pp. 711-715

Laube, T., Schanze, T., Brockmann, C., Bolle, I., Stieglitz, T., Bornfeld, N., 2003, "Chronically implanted epidural electrodes in Göttinger minipigs allow function tests of epiretinal implants", *Graefes Arch Clin Exp Ophthalmol* 241, (12), pp. 1013-1019

Wittsiepe, J., Erlenkämper, B., Welge, P., Hack, A., Wilhelm, M., 2004, "Bioavailability of PCDD/F from contaminated soil in young Göttingen minipigs", *Organohalogen compounds*, 66, pp. 2945-2951

Ph.D. Thesis Andersen, I.S., 2003, "The extrinsic nervous control of large bowel motility", *Ugeskrift for læger*, 165, (47), pp. 4554

Others:  
Graeves, P., Williams, A., Eve, M., 2004, "First dose of potential new medicines to humans: how animals help" *Nature Reviews*, 3, (10), pp. 226-236

**Meeting Calendar 2004/2005**  
Ellegaard Göttingen Minipigs ApS will be represented at the following scientific meetings and exhibitions:

**LASA Annual Meeting**  
24-26 November 2004, Midlands, United Kingdom

**Society of Toxicology Annual Meeting**  
7-9 March 2005, New Orleans, USA

**IAT Congress**  
16-18 March 2005, United Kingdom

**BTS Annual Congress**  
20-23 March 2005, Warwick University, United Kingdom

**Scand-LAS Meeting**  
15-18 April 2005, Uppsala, Sweden

**GV-Solas Meeting**  
We like to take part in relevant GV-Solas meetings

**New Managing Director**

On 1 October 2004 Jens Ellegaard took over the position as managing director of Ellegaard Göttingen Minipigs after Lars Ellegaard. Lars will continue in the company as director responsible for sales and marketing.



Jens holds an MSc degree in agronomy from the Royal Veterinary and Agricultural University in Copenhagen. He has been employed full-time with the company since 2000. In 2001-2004 he managed the minipig activities in the United States. First in

Pennsylvania, where the Ellegaard quarantine and distribution facility for Göttingen minipigs was located. Later, a license agreement was negotiated with Marshall Farms in upstate New York. Here, Jens was responsible for establishing the Marshall Farms minipig breeding facility, from which all Göttingen minipigs to North America are now sold.

Since May 2004 Jens has been back with the company in Denmark. During his stay in the United States the Danish production facilities were expanded significantly. The new facilities are now capable of satisfying the growing demand for microbiologically defined minipigs.

Jens' future goals for the company are to improve the minipig as a research model and make Ellegaard the preferred supplier of non-rodent species to biomedical research. This will be achieved through further socialization programmes and genetic improvement of the Göttingen minipig in collaboration with the University of Göttingen. Training of customers in how to handle the minipigs is another area where the efforts of Ellegaard will be intensified. Ellegaard Göttingen Minipigs will continue to focus on customer satisfaction and help make research with Göttingen minipigs run smoothly. Jens wants to make Ellegaard Göttingen Minipigs an even better place to work in order to maintain and attract well-qualified people.

The overall goal for the company in the future will be to supply the highest quality of Göttingen minipigs and to increase production in order to satisfy the growing demand for Göttingen minipigs. Supply of blood and tissue products is a growing market, and Ellegaard will continue to develop this market, too.



**AAALAC inspection: Full accreditation continues.**

"AAALAC International is very pleased to count Ellegaard as one of its accredited organisations. Not only was Ellegaard the first organisation in Scandinavia to achieve AAALAC accreditation, but over the past six years the company has done an outstanding job of maintaining the high standards required by AAALAC. We commend Ellegaard on its commitment to quality animal care and good science," said John G. Miller, D.V.M., AAALAC International Executive Director.

AAALAC site visitors Timothy H. Morris and Peter Clausing visited Ellegaard Göttingen Minipigs ApS (EGM) in August 2004.

During the three-day visit, both barrier facilities and the conventional unit were visited. Also transport vehicles and service facilities were shown and approved.



EGM has a quarantine period between the two barriers of 36 hours, which necessitates a three-day visit. Barrier 2 was visited on the first day. During the second day all SOPs were examined. On the third day Barrier 1 was visited. The cleaning area for boxes and the transport vehicles are regarded as less clean areas than the barriers and were visited after the visit to Barrier 1. The conventional unit is situated approximately 10 km from the main facility and is regarded as the least clean area of EGM. Therefore this area was visited at the end of the AAALAC visit.

The site visitors gave a good briefing about their visit to all employees at EGM to explain what they had seen and what they thought of our production. Finally a more thorough explanation was given to the management to give more details about the site visit and how their report would be evaluated by AAALAC.

EGM greatly appreciates the AAALAC visits. The visit of independent site visitors, who can look at the facilities and the procedures followed with fresh, non-biased eyes, is a great opportunity to discuss even further improvements of procedures carried out at the company.

EGM is looking forward to the next visit in 2007.

**Advances in the genetic management of Göttingen Minipigs**, by Prof. Dr. Henner Simianer, and Dr. Helge Täubert, Institute of Animal Breeding and Genetics, University of Göttingen. One of the major challenges in the breeding of experimental animals is to control inbreeding. This is especially true in the Göttingen Minipig, of which

- Barrier-bred minipigs
- Conventional minipigs
- University minipigs
- Biological products
- Procedural aids
- Customer services

only three colonies exist (in Germany, Denmark and the United States) with very limited population sizes. Adverse effects of inbreeding are an increased frequency of genetic defects (e.g. extra claws), inbreeding depression, especially in fertility and health traits, and, in the long run, the erosion of the genetic diversity of the population. However, in closed populations of small size a certain amount of inbreeding is unavoidable, hence it is necessary to design the breeding programmes so as to keep the resulting problems at a minimum.

In the past, this was done through so-called line breeding, where ten different paternal lines were kept separate. Although it was possible to keep the increase of inbreeding at an acceptable level, this strategy had two major disadvantages: it did not explicitly improve the genetic structure of the population, and it required maintaining more breeding animals (especially boars) than necessary from a breeding point of view. Also, breeding management was based on a 'manual' system which became intractable with more and larger breeding herds.

Therefore a new system for genetic management was developed by the group of Prof. Henner Simianer at the Institute of Animal Breeding of the University of Göttingen. The procedure is based on up-to-date scientific methodology and is composed of two components: estimation of breeding values with the BLUP method and selection and mating decisions following the concept of optimum genetic contributions (OGC).

The abbreviation BLUP stands for Best Linear Unbiased Prediction and is the optimum procedure to assess the genetic potential of an animal. It was developed around 1960 at Cornell University (USA) by Prof. C.R. Henderson and has become the standard procedure in many farm animal breeding programmes. For the Göttingen minipig the method is used to estimate breeding values for fertility, measured as the number of piglets born alive per litter. The main advantage of BLUP is that an animal's breeding value is not only based on the animal's own performance, but also on the performances of relatives, which are correctly weighted. Thus, fertility breeding values are also obtained for boars and young sows. The estimated breeding values are the basis of selection with the objective of increasing litter size. This, however, increases the risk that related animals (e.g. full-brothers) may be selected as breeders, even increasing the inbreeding level. This is prevented by the use of the optimum genetic contribution



theory. This concept aims at balancing the genetic contributions of the founder animals of the population. Practically, it allows restricting the degree of inbreeding and, under this restriction, selecting the sows and boars with the highest breeding values. In the present implementation the concept is used in two stages: to select piglets at weaning to be kept as potential breeders, and to select boars and sows and set up a mating plan for adult animals on a regular basis.

The connection of BLUP breeding value estimation and OGC selection and mating guarantees maximum genetic progress in the chosen trait with the smallest possible increase of inbreeding in the future.

The whole procedure is implemented on a computer at the

University of Göttingen and can be used by all breeding units. This centralised process has the advantage that methodological improvements or modifications of the models only need to be installed once and will immediately be available to all breeding units.

The use of unified genetic management also guarantees that the sub-populations will develop in the same direction, so that it will make no difference genetically which breeding unit a Göttingen minipig is obtained from.

#### Health status at Ellegaard Göttingen Minipigs (EGM)

The incidence of purulent infections has not increased in the herd since the last health monitoring report. However, at the semi-annual health monitoring in spring 2004, nasal swabs of the Göttingen minipigs turned out positive for haemolytic streptococci. Species identification of the positive sample verified the diagnosis of one animal from Barrier 2. The haemolytic streptococcus was identified as a *Str. dysgalactiae* subsp. *equisimilis*. Skin scrapings examined for bacterial pathogens from the pigs tested at EGM did not test positive for haemolytic streptococci.

No other changes in health status were discovered.

Streptococci are Gram-positive cocci, which are seen as commensals in warm-blooded animals. Streptococci can be classified into different groups according to which kind of haemolysis is seen on blood agar.

*Str. dysgalactiae* belongs to the pyogenic b-haemolytic streptococci and contains Lancefield group A, C, G and L antigens. Infection with pyogenic streptococci can cause arthritis, metritis, endocarditis or septicaemia. *Str. dysgalactiae* is divided into two subspecies; *Str. dysgalactiae* subsp. *dysgalactiae* and *Str. dysgalactiae* subsp. *equisimilis* based on protein profile and biochemical properties (Vandamme, P. et al, 1996)

*Str. dysgalactiae* subsp. *equisimilis* is part of the normal commensal flora of the skin and mucosa in the nose and pharynx of humans and many animal species such as cattle, dogs, cats, pigs and poultry, and is not a frequent cause of the above-mentioned purulent infections. Streptococci of many serological groups are frequently isolated from nasal and pharyngeal secretions of swine. These infections are not known to be associated with disease of the upper respiratory tract (Sanford, S.E. & Higgins, R.).

Since *Str. dysgalactiae* subsp. *equisimilis* is part of the normal mucosal and skin flora of humans, the most likely source of contamination is from one of the staff members. Staff members shower in when entering the barriers. A second washing and disinfection of the hands is performed before entry. This can minimize the risk of transferring commensals from the skin of humans to the minipigs, but not remove it completely.

#### References:

Larsen, H.E., 1996, "Streptokokker og beslægtede kokker", (in Larsen, H.E. & Aalbæk, B., "Veterinær mikrobiologi"), Jordbrugsforlaget, Frederiksberg C, Denmark, pp. 1.18-1.34

Sanford, S.E. & Higgins, R., 1992, "Streptococcal Diseases", (in "Diseases of Swine – 7th edition", eds. Leman, A.D., Straw, N.E., Mengeling, W.L., D'Allaire, S., Taylor, D.J.), Iowa State University Press, Ames, Iowa, USA

Vandamme, P., Pot, B., Falsen, E., Kersters, K., Devriese, L.A., 1996, "Taxonomic study of Lancefield groups C, G, and L

(*Streptococcus dysgalactiae*) and proposal of *S.dysgalactiae* subsp. *equisimilis*. nov", International Journal of Systematic Bacteriology, 46, pp. 774-781

#### Collecting background data – a way of increasing available information on the Göttingen minipig

When deciding which non-rodent species to use in pre-clinical testing of potential new pharmaceuticals, available background data is of great value and also very important when evaluating test results or findings during studies.

Ellegaard Göttingen Minipigs would like to increase the amount of available data on the Göttingen minipig to help researchers using the minipig. We therefore encourage every facility using the minipig in research to help us make these data available. We are interested in obtaining pre-test results and spontaneous findings, which are regarded to have no direct connexion to the study performed. Pre-test results can be regarded as normal values of the minipig population and this will augment the existing normal background data both in terms of amount of information, but hopefully also make more knowledge available on different age groups of the Göttingen minipig.

The data will be treated confidentially and no company names will be displayed. After the processing of all data, results (mean values, range of value, spontaneous findings etc.) will be available on our website and in this way be readily available.

We have already experienced very positive reactions to this approach and we greatly appreciate any information provided.

For further information please contact us at [ellegaard@minipigs.dk](mailto:ellegaard@minipigs.dk) or call us, phone +45 58185818.

#### Bio-Specimens and Blood products available at Ellegaard Göttingen Minipigs

At Ellegaard we can supply liver cells from Göttingen minipigs, for example:

- Hepatocytes frozen in suspension
- Subcellular fractions (microsomes, cytosols, S9 fractions)

We also offer a wide range of blood products and specimens to support your research.

Blood, serum and plasma of Göttingen minipigs can be delivered to your specifications. The blood will be collected in blood tubes with your choice of stabilizer (sodium heparin/lithium heparin/EDTA/others).

Specimens such as organs/samples of organs, teeth, skin biopsies and other tissues can be harvested and shipped. We will conform to your wishes regarding removal procedure, how to treat the specimen during the removal, storage conditions and shipping conditions.

#### Contact information – Do you have an unanswered question about research in minipigs?

At Ellegaard Göttingen Minipigs we offer to arrange contacts between our customers to disseminate the non-confidential knowledge that we know some of our customers have.

If you need information regarding a specific area of research where the minipigs are used, or where you plan to use minipigs, we offer to contact other companies within the same area of research, and with their acceptance we will pass on their contact information to you. If we know the answer to your question, we

will of course help you directly, but often we are asked questions beyond our knowledge, and we have found our customer contacts very helpful in these cases.

At the same time we would like to thank all our good contacts who have helped us over the years to answer specific questions and communicate their valuable knowledge about minipigs in research. This is also a way of meeting the 3 R's by reducing the use of research animals in an area that has already been investigated.

#### Handling Courses – We can help you to stress-free handling of minipigs.

It is of great importance to Ellegaard Göttingen Minipigs that our customers and other users of the Göttingen Minipigs have a positive impression of handling the animals during research procedures and daily husbandry. At our barrier facilities, procedures are in place to increase the positive social behaviour of the minipigs. In order to ensure this behaviour at the users', Ellegaard offers handling courses to our customers, students and personnel working with laboratory animals free of charge. The courses take place at Ellegaard Göttingen Minipigs ApS, Dalmose.

Courses are offered to new as well as to experienced customers. Courses can be arranged ad hoc as participants need them, or participants can sign up for the scheduled courses. Courses can be arranged for two or more people – so don't hesitate to contact us for a handling course.

The handling course takes one day. It is made up of a theoretical and a practical part. The participants learn about the development of the minipig, the theoretical background for the use of the minipig in biomedical research, the special characteristics of the minipig, housing and husbandry as well as handling and dosing in theory. In the practical part of the course the most common handling procedures such as approach, oral dosage, fixation in a sling and blood sampling will be demonstrated and practised.

The participants will receive a certificate certifying their participation in the handling course.

Handling courses and demonstrations can also be given at a customer's facility – if local legislation allows. If a presentation of specific procedures is desired, please contact Nanna Grand, DVM: Email: [nanna.grand@minipigs.dk](mailto:nanna.grand@minipigs.dk), phone: +45 58185818

To schedule a handling course, please send an email to [ellegaard@minipigs.dk](mailto:ellegaard@minipigs.dk) or call +45 58185818

#### Surgery Course

In 2005 a two-day minipig surgery course will be held in Copenhagen. The agenda of the course is not yet finalized. If you would like the course to include a certain surgery technique, please contact us and we will do our best to include it in the course.

#### Literature database on Ellegaard Göttingen Minipigs' Homepage

The literature database on Ellegaard Göttingen Minipigs' homepage is updated regularly. The database contains 7800 abstracts about minipigs.

When searching for articles in the literature database, you must type a search phrase or word in the empty box in the top right