Borders open to Göttingen Minipigs

Lars Ellegaard

We are happy to be able to deliver Göttingen Minipigs to research institutions in countries all over the world. From January 1, 1993 the open borders in Europe have made it possible to deliver the animals in all EC countries without veterinary restrictions.

The Göttingen Minipig will be microbiologically defined and of a high genetic quality.

From August 1, 1993 our Göttingen Minipigs will be produced in new, high-standard breeding facilities behind an efficient barrier. We plan an annual production of 1500 animals. Furthermore, we can offer to prepare models specially designed to suit your experimental needs. We have experience in preparing models for arteriosclerosis, catheterized models, and pregnant animals for teratological experiments.

We have an extensive database, at the disposal of our customers, where information on the newest literature concerning minipigs can be found. References are drawn from the database CAB, AGROCOLA, SCISEARCH, BIOSIS, and MEDLINE. Our database is updated every third month.

The Newsletter is intended to give you up-to-date information regarding our minipig production. It will be published three or four times a year. At present our mailing list comprises about 500 persons working in research institutions.

The Newsletter is planned to contain:

- production news
- breeding news
- articles by scientists on experimental models
- a survey of the newest literature on Göttingen Minipigs

It is my hope that the Newsletter will be of help to you, and I shall be very happy to receive response in the form of suggestions or criticism.

For help in the publishing of the Newsletter I should like to thank dr.med.vet. Per Svendsen, Odense University, professor dr. P. Glodek, Göttingen University, and dr.med.vet. Axel Kærnerup Hansen, Copenhagen University.

New Health and Organizational Structure for Göttingen Minipigs

Prof. Dr. Peter Glodek, Göttingen.

The Georg August University in Göttingen and Ellegaard Göttingen Minipigs in Dalmore have signed a long term contract which opens up a new era of breeding and propagation of the famous Göttingen Minipig.

Ellegaard with the skilful help of the Danish Slaughteries veterinary laboratory in Roskilde has started a new SPF primary herd of Göttingen Minipigs by hysterectomying 37 pregnant sows from the nucleus herd in Göttingen and rearing artificially some 180 piglets in containers. These animals will be the basic stock of a new highly sophisticated SPF production unit just being built in Dalmore, which eventually will breed all Göttingen Minipigs sold for experimental purposes in the world under extremely controlled hygienic conditions. It is planned that the unit will be in full production by the end of 1994.

In the meantime the nucleus breeding unit at the research station of Göttingen University in Rellehausen will be modernized and transferred into SPF status using ambulant hysterectomy of sows from all important genetic families of the conventional nucleus and natural rearing of the progeny on primary SPF-nurses from Dalmore. It is planned that by the end of 1995 all important genetic material has been brought into the new SPF-nucleus and the present conventional nucleus can totally be closed. The main tasks of the new Göttingen nucleus will be the maintenance of the genetic standard in both Göttingen Minipig populations as well as research and development activities. Animal sales will then be restricted to institutions in the State of Niedersachsen.

Both the Göttingen nucleus and the Dalmore production herd will be kept under the genetic supervision of Professor Glodek, Göttingen, to make sure that no genetic material is lost over generations and no inbreeding depressions must be endured in both herds. The first research activities in the new units will concentrate in the following customer requirements:

- Breeding a mikroline of 20 kg adult weight
- Selection for better ear vein quality
- try to select a genetic diabetes II model

Apart from these goals continuous attention will be given to maintain the wellknown stress resistant and reproductive performance and to improve behavioural traits like tameness and docility.
The Göttingen mini-pig as a chronic model

Per Svendsen, DVM.
Head of Animal Department
Odense Hospital University

The Göttingen mini-pig is a useful model in chronic experiments, for instance in studies of gastro-intestinal physiology. The animal tolerates anaesthesia and surgical operations very well, and it is easily trained to stand for hours without fixation. General anaesthesia is induced by sedation with an intramuscular injection of azaperone (Sedaparone vet) 0.5-1 mg/kg mixed with midazolam (Dormicum) 0.5 mg/kg and atropine sulphate 0.05 mg/kg.

Twenty minutes after the initial injection the animal is deeply sedated. A 20 G Venflon catheter is introduced into the auricular vein, and metomidate (Hypnodil vet) 2-3 mg/kg is given until the mini-pig is without muscular reflexes. The animal is now easily intubated, and anaesthesia is maintained with Halothane and nitrous oxide. To secure normal acid-base balance, respiration should be assisted by artificial ventilation.

Health monitoring of Göttingen Minipigs at Ellegaard

Axel Kornesrup Hansen, DVM, University of Copenhagen, Animal Department, DK-2200 Copenhagen N.

Introduction
Infections may influence animal experiments, either by causing disease in the animals or by changing the immunology, physiology, fertility or oncology of the animal. Furthermore, certain microorganisms may compete with experimentally inoculated microorganisms. Last, but not least, biological products from the animal may be contaminated. Some pathological and/or physiological changes caused by environmental or genetic determinants may also ruin research.

Permanent catheters for minipigs are best made for the specific purpose from silicone tubing (Silastic medical grade tubing), excellent for making ligature attachments and for fixation of adapters.

Permanent venous cannulation is best performed via the superficial jugular vein located in the axial fossa. The catheter is tunnelled to the neck region, flushed with heparinized saline and closed with a stopcock. The mini-pig also tolerates permanent catheterization of the gastro-intestinal tract, choledocal duct, pancreatic duct and portal vein. To secure the catheters the mini-pig wears a tight elastic tube bandage (burn net) tied to a leather halter. The bandage is accepted by the mini-pig if applied after surgery. Attempts to accustom the mini-pig to wearing the bandage by applying it before the experiments is usually not advisable, whereas there seems to be no problem when the bandage is applied under anaesthesia.

Health monitoring means the examination of randomly sampled animals in order to define the health status of the colony and tell the absence or presence of specified microorganisms. In order to standardize such monitoring it is crucial to have a standardized programme. Concerning laboratory rodents such a programme is about to be published by the Federation of European Laboratory Animal Science Associations (FELASA). Some national guidelines for slaughterhouse pigs exist in different countries, e.g. in Denmark, but these are not sufficient for defining the animals for experimental purposes.

I have worked with Ellegaard Göttingen Minipigs to create a set of guidelines for experimental pigs. In October 1992 we sampled the first minipigs to be monitored by this system. We are still modifying the system in order to make it scientifically, practically and economically optimal. It is our hope that such a set of guidelines in the future may be accepted by international organizations.

Pathogens and methods
A list of pathogens monitored is given in table 1. So far, none of these pathogens have been observed in the inbred Ellegaard colony. When monitoring rodents animals are sacrificed for sampling. This gives the advantages of taking all samples from the same animals, and being able to evaluate the presence of pathological changes. However, due to economic reasons future samples from minipigs will be taken from live animals. Furthermore, this gives the advantage of being able to sample from the most optimal source, e.g. for viral serology from elder animals and for parasitology from younger animals.
Sample size and frequency
The sample size may be calculated on the basis of the accepted confidence limit (normally 0.05), the prevalence of the infection in question and the sensitivity of the test used. In this minipig programme a sample size of 10 is used, the same as proposed in the FELASA guidelines for rodents. This should give an acceptable confidence limit for each of the pathogens monitored with the methods described in table 1. How often to sample is more judged by curiosity than by statistics. We have chosen to sample twice per year.

Reporting
A report telling the exact status on each of the agents listed in table 1 will be issued after each investigation. This report does not only give the result of the latest tests performed, but also summarizes the historical results, as well as the methods and the laboratories involved. We have tried to make the minipig report close to what is recommended by the FELASA working group for rodents. A report based on the investigations performed in October 1992 is available from the company on request.

References
5. Danske Slagterier: Betingelser for deklarert kontrol med svineleysenter; Betingelser for deklarert kontrol med skab; Betingelser for deklarert kontrol med ondartet lungesyge (Hv2); Betingelser for deklarert kontrol med midsom ny sesyge; Danske Slagterier, Copenhagen, 1987.

Table 1 Pathogens included in health monitoring of microbiologically defined Göttingen minipigs, as well as the material sampled and the methods used.

**VIRAL INFECTIONS**: MaterialMethod to be used

- **Aujeszky’s disease**: Serum ELISA
- **Porcine Epidemical Diarrhoea**: Serum ELISA
- **Porcine Influenza**: Serum ELISA
- **Porcine Parvovirus**: Serum ELISA
- **Porcine Rotavirus**: Faeces ELISA
- **Transmissible Gastroenteritis**: Serum ELISA

**BACTERIAL AND FUNGAL INFECTIONS**

- **Actinobacillus pleuropneumoniae**: Nasal swab Culture
- **Bordetella bronchiseptica**: Nasal swab Culture
- **Campylobacter spp**: Faeces Selective enrichment and culture
- **Clostridium perfringens**: Faeces Selective enrichment and culture
- **Erysipelothrix rhusiopathiae**: Skin Culture
- **Eubacterium suis**: Nasal swab Culture
- **Hemophilus parasuis**: Serum Complement fixation assay
- **Listeria monocytogenes**: Nasal swab Culture/Microsporon spp
- **Mycoplasma hyopneumoniae**: Serum ELISA
- **Pasteurella spp**: Nasal swab Culture
- **Salmonella spp**: Faeces Selective enrichment and culture
- **Staphylococcus hyicus**: Skin Culture
- **7-hemolytic streptococcus/Nasal swab Culture**: Streptococcus pneumoniae Nasal swab Culture
- **Treponema spp**: Serum Haemagglutination assay
- **Trichophyton spp**: Skin Culture
- **Yersinia enterocolitica**: Faeces Selective enrichment and culture

**PARASITOLOGICAL INFECTIONS**

- **Arthropods**: Skin Microscopical inspection
- **Helminths**: Faeces Flotation
- **Eimeria spp**: Faeces Flotation
- **Isospora spp**: Faeces Flotation
- **Toxoplasma gondii**: Serum Immunofluorescence assay
References on the use of minipigs in biomedical research

Ellegaard Göttingen Minipigs has access to a great number of references from major databases within biomedical research. If you have any specific wishes on literature for your project, we shall be happy to help you. To show current research on minipigs there will in every future newsletter be a few selected references as those you find below. However, this is only a little piece of what is available, so, if you want information on other subjects, please call us. We may also be able to provide you with a short abstract.

ANATOMY, PHYSIOLOGY AND BIOCHEMISTRY

CARDIOLOGY

ENDOCRINOLOGY


IMMUNOLOGY

MICROBIOLOGY

ONCOLOGY

PHARMACOLOGY & TOXICOLOGY

SURGERY
2. ILLI, OE; STAUFFER, UG; SAILER, H.; BECK, P. BIODEGRADABLE OSTEOSYNTHESIS IN CRANIOMAXILAR SURGERY. CHIRURGIE PEDIATRIQUE. 1990, V31, N4,5, P240-244; 1990.