

### AccuSampler® - now for use in minipigs

The jugular vein or the precaval sinus is usually used for obtaining blood samples from Göttingen Minipigs. Although this method is easy to use, it is most suitable for infrequent blood sampling. Frequent blood sampling of minipigs can be difficult if a blood vessel (e.g. the jugular vein) is not catheterized. Catheterization of minipigs is routine in many places and ensures that staff can inject or take blood samples from pigs while minimizing the pigs' level of stress. But even with catheterization, staff interaction with the pigs is still required for making injections or taking blood samples. Some blood parameters in the pigs may change merely as a reaction to staff entering the pen. A new approach to stress-free treatment or blood sampling of minipigs involves the AccuSampler®.

The AccuSampler® is an automated blood sampler widely used in research involving

possible to keep the animal in a 2x2-metre pen where it still has freedom of movement. Pigs can also be trained on a treadmill while connected to the AccuSampler®.

Novo Nordisk A/S, DiLab® and Ellegaard Göttingen Minipigs are planning a seminar in autumn 2005 where the AccuSampler® will be introduced and its usefulness to minipig research will be demonstrated (see "2005 Courses").

### New ordering procedure for ensuring high quality

We have introduced a new ordering procedure for ensuring that you receive the exact minipig quality required for your studies. We receive orders from many different research facilities: some are small companies where the person doing the ordering is also in charge of the study; others are global companies with large purchasing departments. When communicating with a person closely involved in a study, it is easy to determine the specific minipig requirements for the study in question. But when communicating with someone from a large purchasing department, it is sometimes difficult for them to know the type of study for which the minipigs are to be used and, thus, the specific minipig requirements. As a result, we have introduced a new procedure whereby, whenever we receive a purchase order, we reply with an email in which we ask questions regarding age, weight, type of study, dosing route and housing requirements, as well as whether Ellegaard should provide further scientific advice to maximise the information available to minipig users before the study begins.

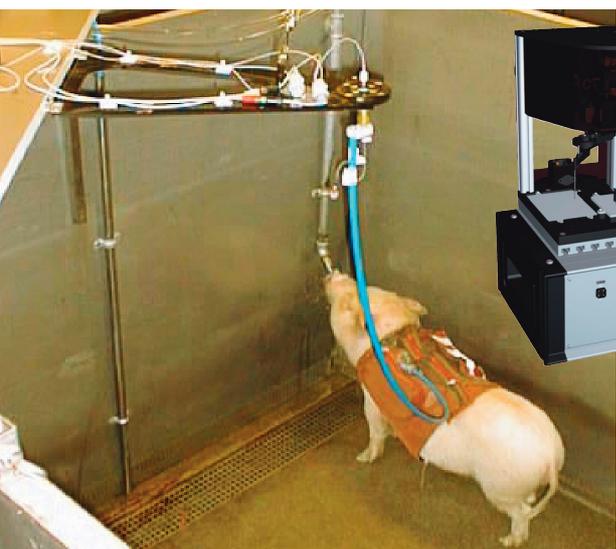
Please help us with this new procedure by forwarding the email from the purchasing department to those involved in the study so we can provide the highest quality of minipig for your studies.

### Health Monitoring Report, Spring 2005

The Health Monitoring Report, Spring 2005, has no new findings.

### Reference data from pre-study measurements

In order to increase the availability of pre-study reference data from Göttingen Minipigs, Ellegaard Göttingen Minipigs has established a database system in which pre-study reference data are compiled in several main fields. We expect these fields to expand concurrent with



Picture courtesy of Novo Nordisk A/S

rodents. It has now been developed for use in pigs and minipigs as well.

The AccuSampler® ensures stress-free treatment or blood sampling of the animals because no direct staff handling is necessary. This heightens the reliability of the obtained samples because the parameters sensitive to acute stress are not affected, thereby improving the analysis itself and the data quality.

The AccuSampler® for pigs is based on the same principles as for rodents, with a few modifications. For example, the AccuSampler® for pigs has a larger pump, to handle larger volumes of blood, and a larger balancing arm, making it

Clean pigs for clear results



Minipigs

Biological products

Auxiliary equipment

Training & Courses

the reception of sufficient data. We have received data from several customers, for which we are very grateful, as this helps to make the basic data as comprehensive and representative as possible. The purpose of the database is to enable us to extract data about the Göttingen Minipigs in certain age groups and/or sex under the main fields. The extracted data is then summed up in Excel spreadsheets where the specification shows the number of measurements and the average, minimum, maximum and standard deviation values for each component/area measured for which data is available.

At the moment we have registered measurement data for the following main fields:

- Haematology
- Clinical chemistry
- Organ weight
- Electrocardiography and
- Urine analysis

As mentioned above, however, we expect to expand the main fields to include data concerning eyes, pathology, histopathology and others.

Basically, we have developed the system so we can receive data from our customers in almost any registration format, such as paper reports or files sent to us electronically. We prefer to receive data electronically, as this greatly facilitates the process of entering data in the database.

If the identity number of pigs in the measurement data is not identical to our five-digit number on the pigs, we would be pleased to receive a list correlating the measurement data identities with our pig numbers. The reason for this is that we then can connect the data received on the individual pig enabling us to determine a pig's age at the time of measurement, among other things. This also means that we

need the registration dates (or week numbers) of the various measurement data, unless these dates/week numbers are directly included in them.

The following is a brief description of the system and its use. We receive data from one of our customers. We examine the material to see if the nomenclature of the components/areas of measurement are defined. All data in the database must be presented in the same unit of measurement so they are directly comparable. Our system ensures this during the input process. Any new components/areas of measurement and units of measurement, compared to those already defined, will then be created so they can be used during input into the database.

We make sure a defined relation exists between the customer's pig identity and the pig's identity at Ellegaard Göttingen Minipigs (pig no. or chip no.). The dates of the respective measurements in the material and, if necessary, the measuring device are defined so that it is contracted into the material during input.

Our programs adapt the measurement data to verify that all information is valid before it is entered into the database, which forms the foundation of the system.

We prefer to receive queries about measurement results (by telephone or e-mail) regarding certain main fields for a selected group of pigs – by sex and/or age. We will extract data and insert them into an Excel spreadsheet where we will make the calculations mentioned earlier: number of measurements, average, minimum, maximum and standard deviation values.

The Excel spreadsheet resulting from these calculations will be sent to you for your use and evaluation.

To give an impression of how the extracted data will be presented, an example of an Excel spreadsheet with data from the database is shown below.

Urine analysis							
Measured	Sex	No of Measures	UoM	Avg value	Min value	Max value	Std +/-
Age	Male	143	Months	3,5	2,4	5,3	0,7
Age	Female	144	Months	3,5	2,4	7,1	0,8
Volume	Male	119	ARB.UNIT	246	5,0	1132	158,1
Volume	Female	120	ARB.UNIT	301	38,0	690	131,5
Ca	Male	72	MMOL/L	2	0,0	16	2,4
Ca	Female	72	MMOL/L	1	0,1	8	1,3
Ca/Crea	Male	72	MMOL/L	69	0,1	3030	418,0
Ca/Crea	Female	72	MMOL/L	6	0,0	412	48,5
Creatinine	Male	72	MMOL/L	4745	1,0	14630	4091,1
Creatinine	Female	72	MMOL/L	4683	6,0	16012	4245,8
Glucose	Male	72	ARB UNIT	0,04	0,000	2,00	0,262
Glucose	Female	72	ARB UNIT	0,04	0,000	1,00	0,201
Haemoglobin	Male	72	ARB UNIT	0,7	0,00	4,0	1,14
Haemoglobin	Female	72	ARB UNIT	0,1	0,00	5,0	0,62
Methyl ketones	Male	72	ARB UNIT	0	0,0	1	0,1
Methyl ketones	Female	72	ARB UNIT	0	0,0	0	0,0
PH	Male	84		7,7	6,00	9,0	0,70
PH	Female	84		7,9	6,50	9,0	0,68
Sp.Gravity	Male	191		633,57	1,000	1030,00	493,366
Sp.Gravity	Female	192		633,19	1,000	1025,00	490,985

The purpose of the database is to assist our customers and we intend to extend it even further to include all measurement data of great value to research when developing new areas.

## Various qualities of Göttingen Minipigs

Ellegaard Göttingen Minipigs offers three different grades of Göttingen Minipigs depending on your requirements. All grades are outbred and genetically defined.

**Barrier-bred Göttingen Minipigs** have a unique health status and are health-monitored twice a year based on FELASA recommendations. Barrier-bred Göttingen Minipigs are tested for 38 pathogens to obtain the best quality of pig possible. This microbiologically-defined grade is a reliable model for GLP-safety testing studies, as well as other studies requiring high health status.

**Conventional Göttingen Minipigs** are born in a barrier facility and moved to a conventional facility when they are retired as breeders or older than six months. Conventional animals are tested for *Mycoplasma hyopneumoniae*, *Actinobacillus pleuropneumoniae* (type 1,2,4,5,7,8,9,10), *Bordetella bronchiseptica*, *Brachyspira hyodysenteriae*, *Lawsonia intracellularis* and toxin producing *Pasteurella multocida*. Conventional Göttingen Minipigs are available in weights from 15–35 kg. The cost is about 60% that of barrier-bred Minipigs.

**Assorted Göttingen Minipigs** are eight months or older and sold at a significantly reduced price to prevent surplus animals. The grade varies with regard to age, weight and minor defects. The health status can be either barrier or conventional. This grade is an affordable option to universities, PhD students and others, or an alternative to ordinary farm pigs. Limited availability and only short term reservations.



*Please contact Trine Christensen – she will be pleased to take your order.*

## 2005 Courses

### Surgery courses:

This year, the surgery course will be included as a part of the Masters study programme at the Royal Veterinary and Agricultural University of Copenhagen (KVL), but it is not necessary to be a full-time Masters student to participate in the course.

The course will take place from 10–14 October 2005. For more information, please send an email to [ellegaard@minipigs.dk](mailto:ellegaard@minipigs.dk)

More information on the course will be available on our website ([www.minipigs.dk](http://www.minipigs.dk)) when the final programme is announced.

### Handling courses:

The correct handling of the Göttingen Minipigs is crucial when minipigs are included in research. Ellegaard Göttingen Minipigs ApS offers free handling courses, which have become very popular. These courses are organized as needed and can take place at Ellegaard's facilities in Denmark or on your premises.

The handling course includes a theoretical introduction to various aspects of the Göttingen Minipig – including the history, genetic management, husbandry and handling of the Göttingen Minipig – and a practical demonstration of basic procedures, etc., which the participants have the opportunity to try for themselves.

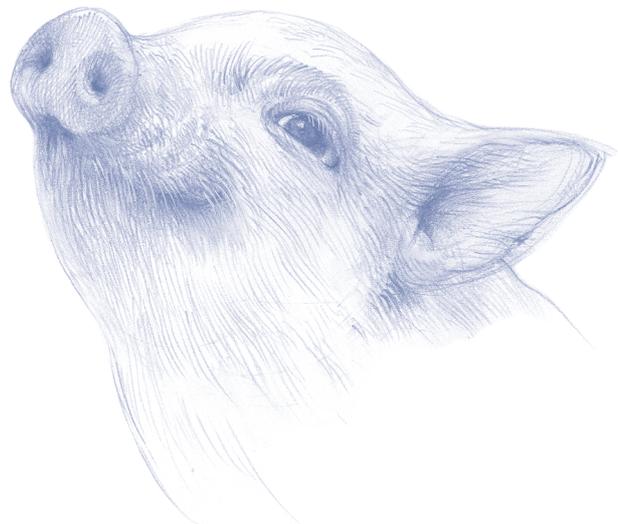
For more information or to schedule a handling course, please send an email to: [ellegaard@minipigs.dk](mailto:ellegaard@minipigs.dk) or call +45 5818 5818.

### AccuSampler® Seminar:

Novo Nordisk A/S, DiLab® and Ellegaard Göttingen Minipigs ApS are planning a seminar to be held in autumn 2005, where the use of the AccuSampler® in studies with minipigs will be demonstrated. The seminar will include a theoretical dimension and a practical demonstration. The practical demonstration will be divided into two parts: 1) a demonstration of jugular-vein catheterization; and 2) the connecting of a catheterized pig to an AccuSampler® to demonstrate the ease with which blood sampling and dosing are performed using the AccuSampler®.

For more information, please send an email to: [ellegaard@minipigs.dk](mailto:ellegaard@minipigs.dk) or call +45 5818 5818.

Further details will be available on our website: ([www.minipigs.dk](http://www.minipigs.dk)) when the final programme is announced.



## Meeting Calendar 2005

Ellegaard Göttingen Minipigs will be represented at the following scientific meetings and exhibitions in 2005:

ETS (European Teratology Society) – [www.etsoc.com](http://www.etsoc.com)  
3–7 September 2005, Haarlem, the Netherlands

EUROTOX – [www.eurotox.com](http://www.eurotox.com)  
11–14 September 2005, Krakow, Poland

GV-Solas – [www.gv-solas.de](http://www.gv-solas.de)  
11–14 September 2005, Berlin, Germany

Safety Pharmacology Society Meeting  
[www.safetypharmacology.org](http://www.safetypharmacology.org)  
26–28 September 2005, Mannheim, Germany

ESTP – European Society of Toxicologic Pathology  
[www.eurotoxpath.org](http://www.eurotoxpath.org)  
29 September – 1 October 2005, Copenhagen, Denmark

LASA Annual Meeting – [www.lasa.co.uk](http://www.lasa.co.uk)  
30 November – 1 December 2005, United Kingdom

## New articles about Göttingen Minipigs

Antoch, G., Vogt, F.M., Veit, P., Freudenberg, L.S., Blechschmid, N., Dirsch, O., Bockisch, A., Forsting, M., Debatin, J.F., Kuehl, H., 2005, "Assessment of liver tissue after radiofrequency ablation: findings with different imaging procedures", *J. Nucl. Med.*, 46, (3), pp. 520-525.

Bimczok, D., Sowa, E.N., Faber-Zuchstratter, H., Pabst, R., Rothkotter, H.J., 2005, "Site-specific expression of CD11b and SIRPalpha (CD172a) on dendritic cells: implications for their migration patterns in the gut immune system", *Eur. J. Immunol.*, 35, (5), pp. 1418-1427.

Bjarkam, C.R., Cancian, G., Larsen, M., Rosendahl, F., Ettrup, K.S., Zeidler, D., Blankholm, A.D., Ostergaard, L., Sunde, N., Sorensen, J.C., 2004, "A MRI-compatible stereotaxic localizer box enables high-precision stereotaxic procedures in pigs", *J. Neurosci. Methods.*, 139, (2), pp. 293-298.

Bollen, P.J., Madsen, L.W., Meyer, O., Ritskes-Hoitinga, J., 2005, "Growth differences of male and female Göttingen minipigs during ad libitum feeding: a pilot study", *Lab. Anim.*, 39, (1), pp. 80-93.

Hennig, U., Metges, C.C., Berk, A., Tuchscherer, A., Kwella, M., 2004, "Relative ileal amino acid flows and microbial counts in intestinal effluents of Göttingen Minipigs and saddleback pigs are not different", *J. Anim. Sci.*, 82, pp. 1976-1985.

Jelsing, J., Olsen, A.K., Cumming, P., Gjedde, A., Hansen, A.K., Arnfred, S., Hemmingsen, R., Pakkenberg, B., 2005, "A volumetric screening procedure for the Göttingen minipig brain", *Exp. Brain. Res.*, 162, (4), pp. 428-435.

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Lind, N.M., Olsen, A.K., Moustgaard, A., Jensen, S.B., Jakobsen, S., Hansen, A.K., Arnfred, S.M., Hemmingsen, R.P., Gjedde, A., Cumming, P., 2005, "Mapping the amphetamine-evoked dopamine release in the brain of the Göttingen minipig", *Brain. Res. Bull.*, 65, (1), pp. 1-9.

Maier, G.W., Kreis, M.E., 2005, "Limited nutritional energy supply differentially impairs growth and bone mineralization of the developing lumbar vertebrae in minipigs", *Bone*, 36, (3), pp. 512-520.

Moustgaard, A., Arnfred, S.M., Lind, N.M., Hemmingsen, R., Hansen, A.K., 2005, "Acquisition of visually guided conditional associative tasks in Göttingen minipigs", *Behav. Processes*, 68, (1), pp. 97-102.

Nielsen, L.S., Lind, N.M., 2005, "Measurements of three ocular parameters in the Göttingen minipig", *Scand. J. Lab. Anim. Sci.*, 32, (1), pp. 9-16.

Tsutsumi, H., Katagiri, K., Morimoto, M., Nasu, T., Tanigawa, M., Mamba, K., 2004, "Diurnal variation and age-related changes of bone turnover markers in female Göttingen minipigs", *Lab. Anim.*, 38, (4), pp. 439-446(8).

