

Technical Guide

# Management of Pregnant Göttingen Minipigs and their Litter



Adrian Zeltner  
Ellegaard Göttingen Minipigs  
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**ELLEGAARD** • •  
GÖTTINGEN MINIPIGS

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## Introduction

Ellegaard Göttingen Minipigs has specific recommendations regarding the care of pregnant sows and piglets 8 weeks of age and younger.

This guide will help you to prepare for your juvenile study and we have tried to include all the relevant information. For successful farrowing and survival of new-born piglets at a customer's facility, please observe the following information carefully.

However, taking care of pregnant and new-born Minipigs is complex and not all relevant information can be conveyed by a written note. Therefore, we offer also practical training at our facility or a visit to your facility by one of our staff to make sure you will be successful with the project. Please contact us for further information.

## Contact

For further information please contact the author at: [az@Minipigs.dk](mailto:az@Minipigs.dk) or [ellegaard@minipigs.dk](mailto:ellegaard@minipigs.dk)

## Background

Göttingen Minipigs are raised in a barrier environment and do not receive routine vaccinations. It can be very valuable to evaluate any potential exposure from staff or other animals before receiving pregnant sows or determine if a vaccination program at your facility is necessary.

Do observe good hygiene and do not house Göttingen Minipigs together with farm pigs or minipigs with a lower health status.

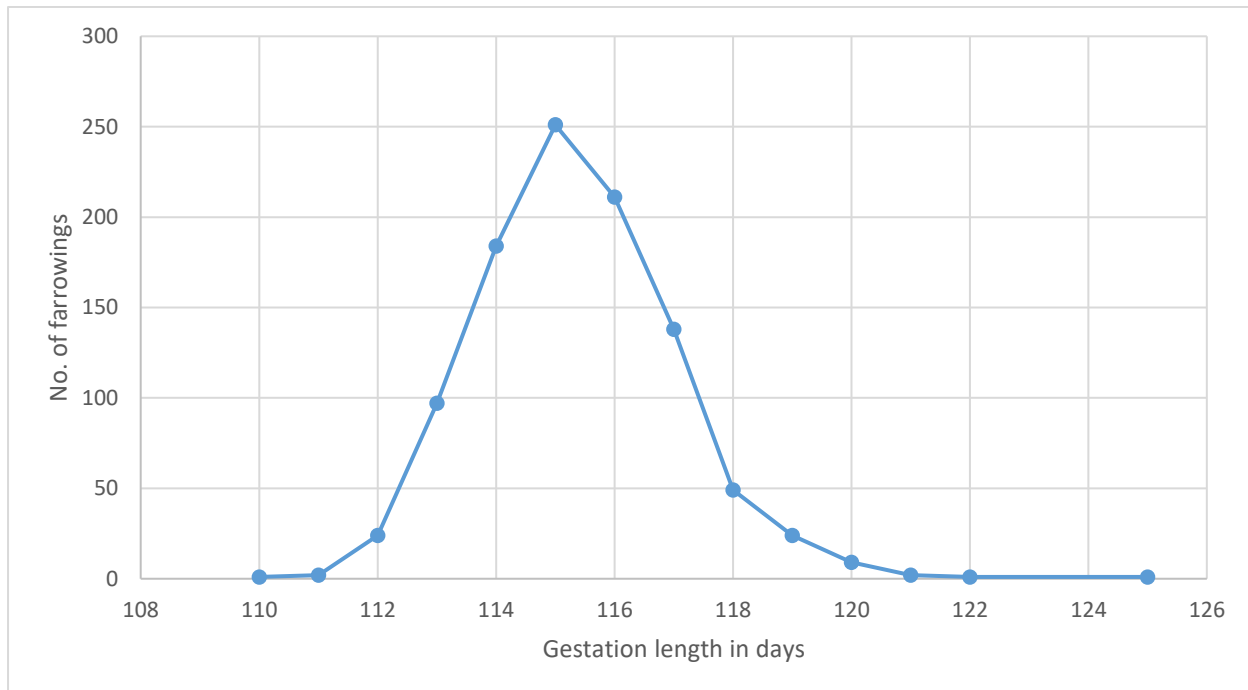
## Delivery to your facility

Pregnant sows will be shipped up to three weeks prior to farrowing. This will be done by our experienced drivers in a HEPA filtered and air-conditioned van.

For practical and welfare reasons we do not ship Minipigs younger than 8 weeks.

## Duration of pregnancy

Although the length of gestation in minipigs varies, most sows farrow on days 114 to 116.



## Sampling and dosing

Under ideal circumstances you can start dosing very early the following is a guide only, please consult further literature for details.

Oral gavage, intramuscular, dermal, ocular	as early as	PND1
Subcutaneous	as early as	PND4
Intravenous	as early as	PND5
Implantation of catheters	as early as	PND5
Blood sampling	as early as	PND1

## Housing and socialization

A pregnant sow should be moved to the farrowing pen 7 to 10 days prior to her due date. Make sure the sow is well acquainted with the animal-care staff. Enter the sow pen several times a day and try to rub the back and udder of the sow. Often, they like this, and it will result in calm sows to work with during farrowing and nursing. Be aware that pigs are individuals: if a sow does not like to be rubbed, try to find another interaction that she likes. Having close contact also gives you

a sense of how close to farrowing the sow is. The udder will be harder, and the teats will have milk in them as the sow gets near parturition. Do not try to force milk out of the teats. Make sure they have adequate bedding material, preferably straw, because sows like to engage in nest-building a day or two before farrowing. Even if the sow was friendly and sociable before delivery, it is possible that she will be protective after farrowing and it can be difficult to get near her or the piglets. This is especially the case with first time mothers.

## Pen requirements

Pens should be robust, since swine are forceful animals with strong snouts. They also rub their sides along the sides of the pen, pushing with considerable weight. Strong materials must be used to build the pens. Make sure that there are no sharp edges or bolts protrude into the pen.

The minimum area of the farrowing pen is 2 m<sup>2</sup>. An iron pipe (diameter 20–30 mm) mounted along all the walls (10 cm above the floor and 8–10 cm away from the wall) will reduce the risk of piglets being crushed when the sow lays down. The floor should be covered with no more than 1–2 cm of bedding (more bedding will restrict the mobility of new-born piglets).

The maximum opening in the walls of the pen or between the wall and the floor in the pen should be 15–20 mm. New-born piglets can get caught in larger openings.

An area of around 2,000 cm<sup>2</sup> in the corner or side of the pen should be set aside as a piglet area and be inaccessible to the sow. Strong bars or panels should keep the sow out of this area. This area could be created in a corner with a 70-cm long and 90-cm high panel, attached at a 45-degree angle. Alternatively, the panel could be along one side of the pen. Choose a design that is easiest to build and provides the best shelter for the piglets. The piglets must be able to pass under the bottom of the panel, so it should be mounted with a gap of 10–12 cm from the floor. This piglet area must have solid flooring or a solid rubber mat as flooring. Prevent any draughts from openings in the floor or walls in this area.

Hang a 150–250 W heat lamp in the piglet area about 30–45 cm above the floor. Consider the fire risk of placing the heat lamp too close to rubber or plastic materials. It is important that the sow cannot reach the heat lamp or the cord – remembering that the sow can stand on her hind legs and reach a height of 75–100 cm.

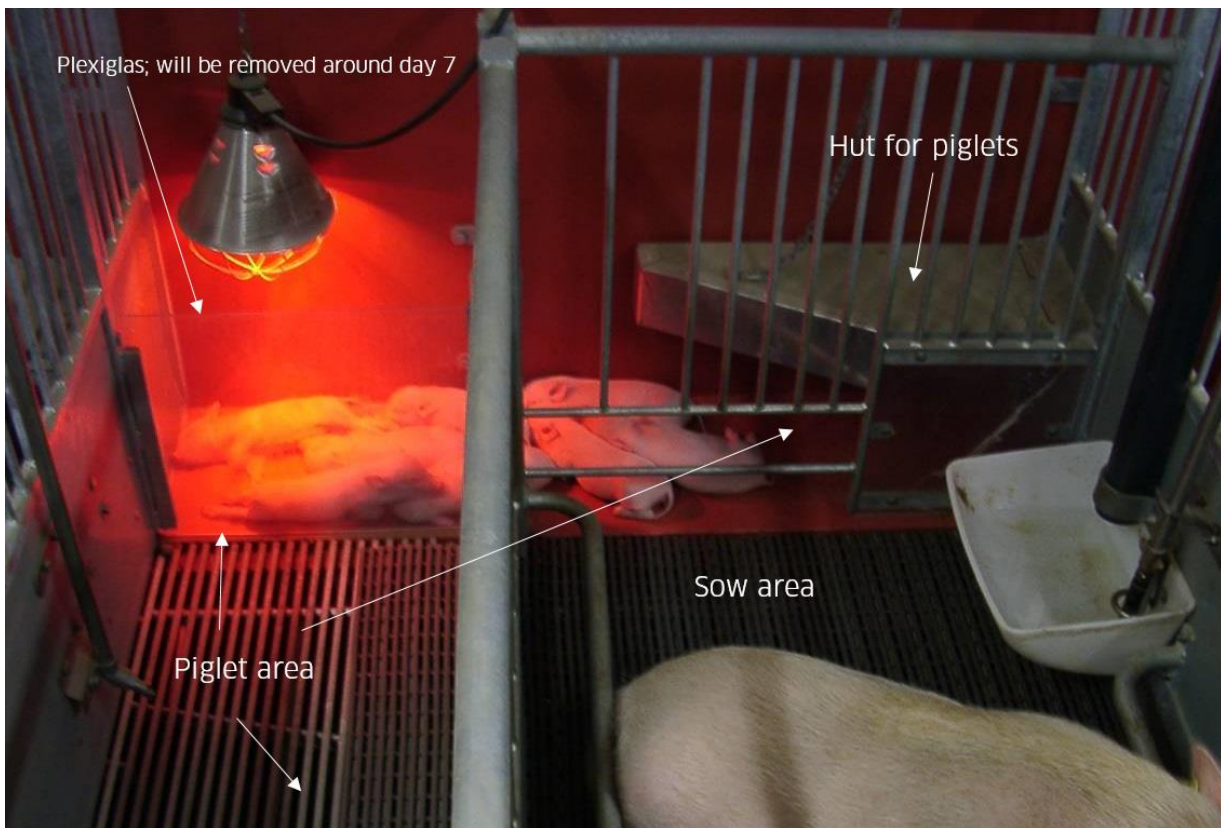
To prevent draughts when the heat lamp is turned on (chimney effect), a fireproof panel can be mounted as a roof inside the piglet area. The roof, with a hole just the size of the heat lamp, is placed 30–45 cm above the floor, and the heat lamp is placed in the hole.

Leave some of the floor area uncovered so there is the possibility to provide water and diet to the piglets.

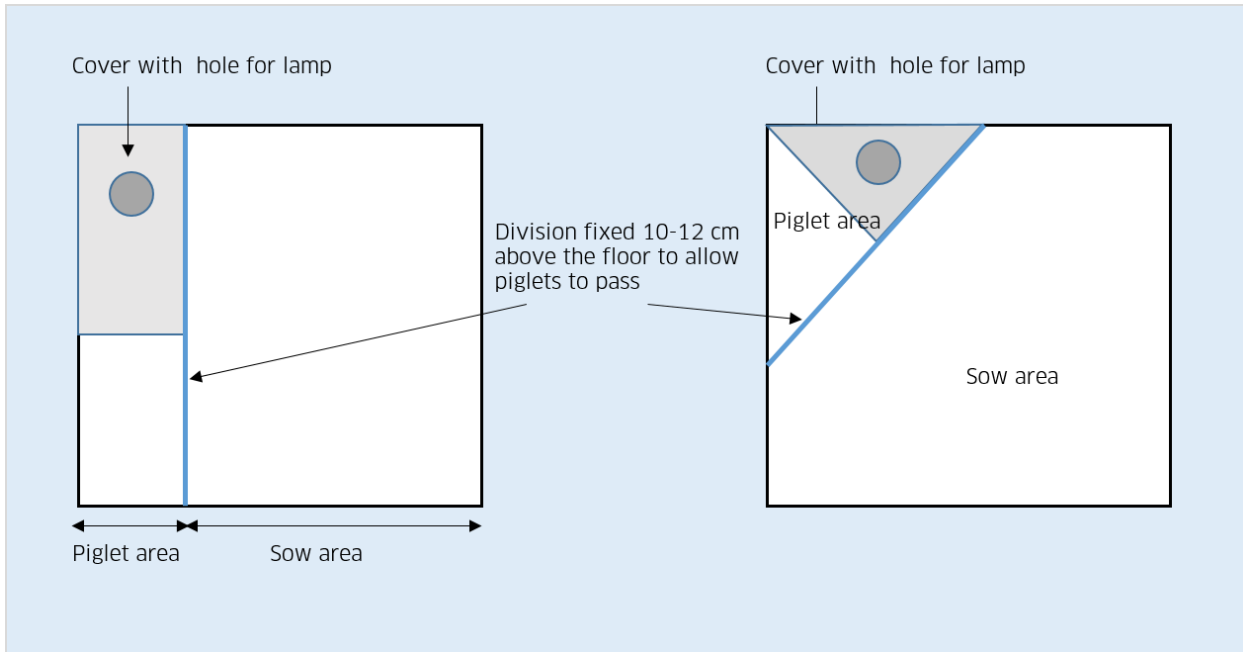
The following pictures are for your inspiration:



Farrowing pen at Ellegaard Göttingen Minipigs



Previous farrowing pen at Ellegaard Göttingen Minipigs



Suggestions to turn a normal pen to a farrowing pen

## Water supply

The sow must have access to plenty of water, either from a water nipple supplying a minimum of 2-4 litres per minute or from a firmly-attached bowl. Fresh water should also be provided in the piglet only area.

## Temperature

The room temperature at sow height should be 18-20°C.

In the piglet area, the temperature must be at least 34°C for new-borns. After that, gradually reduce it to 23°C by the time of weaning. At Ellegaard we have electronically controlled heat lamps to control the temperatures in the piglet area. If you use an ordinary heat lamp, the temperature adjustment can be achieved by raising or lowering the lamp or by using a dimmer. Observe where and how the piglets are resting as an indication that the temperature is right. If they lie in a heap, clumped together right under the lamp it may be too cold. On the other hand, if they lie spread out away from the lamp it might be too warm. Use the following table as a guide:

Days after farrowing	0	7	14	21	28
Temperature, °C	34	31	27	25	23

When the piglets are around 14 days old, you may turn off the heat lamp and remove it. Cover the hole in the roof-panel to prevent heat loss from the piglet area. If the piglets seem cold after 1 or 2 hours (they are shivering and huddling together), the heat lamp should be put back. Weaned piglets should have a room temperature of 22-23°C. Provide a hut or a heat lamp they can use at their leisure.

## Air

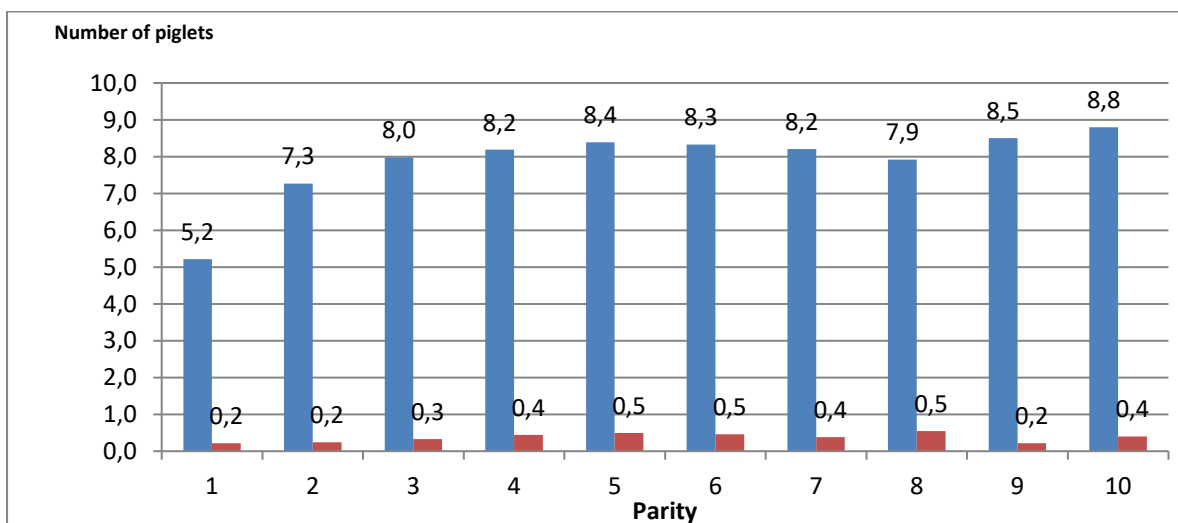
Humidity should be kept between 50 – 70% - ventilation at 10-15 air changes/hour. Beware of draught.

## Bedding

Minipigs should be provided with bedding or rooting material. At Ellegaard, they are used to chopped straw, but any other material which satisfies their natural urge to root will be appreciated. Long straw is the optimal bedding to satisfy the strong instinct of the sow to build a nest before farrowing. If straw is not an option, other nest building material needs to be provided.

## Parturition and care for new-born piglets

A **common** litter size for a first parity sow is 4–5 piglets, whereas an experienced breeder will have litters of 6–10 piglets. Occasionally the litter size can be more, but the sow can only manage litters up to 8 piglets successfully. Cross fostering will be required for larger litters.



The figure shows the average number of piglets born alive (in blue) and stillborn (in red) in the period 2011–2014 divided into parity.

When the sow lies down and starts to go into labour, leave her alone but check her frequently without disturbing her. Sows often farrow during the night, but most do very well at parturition and need no help, nor can much be given. If a sow has been in labour for more than two hours and no piglets are born, take her out of her pen and walk her for 5–10 minutes in the aisle. Do not use Oxytocin to induce labour or when farrowing has stopped temporarily.



After all the piglets are born and the sow has passed the afterbirth/placenta (you may not find it if the sow has eaten it), record her rectal temperature. If it is below 38.5°C, she is OK. If it is 38.5–39.5°C, keep observing her to make sure she is doing well, is alert and interested in the piglets. If her temperature is above 39.5°C, treat her with antibiotics and NSAID. If the sow is not eating the day after farrowing, it indicates that she is not well, and that she might need treatment.

Body temperature can naturally vary a lot and can rise to 39°C in healthy Minipigs. By itself it is a poor indicator regarding the health of the animals.

In some cases, it is possible that the sow is confused and aggressive after farrowing, especially if it is her first time. Aggression can be directed toward caretakers (as she tries to protect her offspring) or towards the piglets (biting or killing them). Aggression towards caretakers is often seen on the first day only, and it usually helps to give the sow some space but keep visiting and talking calmly to her. This way, the sow learns that the caretaker poses no threat. If she is aggressive towards the piglets, you can remove them if you have another so that can take them on. See the chapter about cross fostering. It might also help if you take the sow out of the pen and let her have a walk-about. Alternatively, you can lightly sedate her with Midazolam or other mild sedative.

If the sow does not lie down to offer milk, rub the udder of the sow to make her lie down so the piglets can drink. Oxytocin 20 IE IM (1-2 times) can also be administered to stimulate lactation.

Should you find a piglet which is cold and has a low body temperature, you need to warm it up. The best way to bring the body temperature back to normal is to hold the piglet for 10-15 minutes in a bucket of 38°C warm water with only the head above the water. A weak piglet can be helped along by making sure it drinks colostrum and milk. Place it at the teats of the sow if it can't find the way or is too weak to do so. A product called Piggy Boost (<http://www.newbornanimal-care.com/en/our-products/piglets/10-piggyboost.html>) can be given as well to help the piglet get stronger and gain weight.

You can hand feed the piglets by using commercial milk powder for new-born piglets or cattle, but it is important that the piglets got some colostrum. Initially you can feed from a syringe and later a bottle with teat, but it is a messy business with a lot of spill. More effective is trough feeding which can be done from PND3.

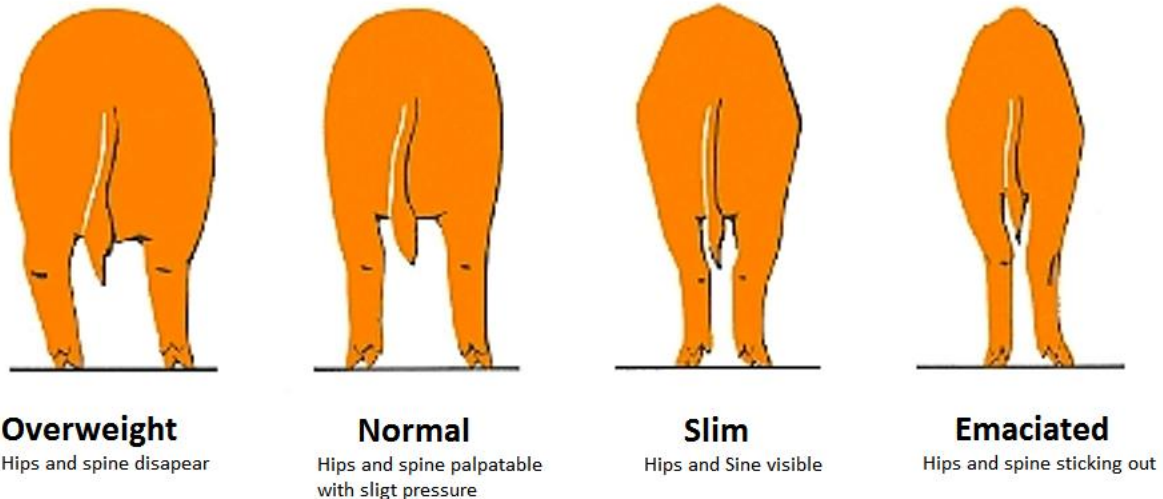


The umbilical cord should be cut to a length of 1-2cm once it is dry.

From 6 to 48 hours after birth, the piglets need to receive an iron product to prevent anaemia. Iron is typically given by IM injection in the neck muscle. At Ellegaard, we use Uniferon 200 mg/ml (<http://www.uniferon.com>) Use a 9–12 mm, 21–25g needle and give 0.5ml/kg bodyweight. (New-born piglets weigh 300–500 grams, so the normal dose of Iron Dextran is 0.15–0.25 ml per piglet).

## Feeding of sows before, during and after farrowing

The following is based on Standard Minipig Diet (SMP) supplied by SDS (<http://www.sdsdiets.com/>) and is only a guide. You have to observe the eating habits and the general condition of the sow closely and decrease or increase the amount of diet accordingly. This drawing will help you in your judgment:



Feed twice a day. Each sow gets 370 grams each time. During parturition, the sow might not want to eat but offer her some diet when parturition is completed.

After farrowing, increase the diet amount by 50% (2 x 550g). Thereafter, increase the amount of diet steadily and adjust every second day according to appetite and condition of the sow. The amount of diet given depends on the litter size as well. As a guide, add around 90 g per feeding every day and observe whether the sow eats up. Some days after farrowing the feeding regime is essentially ad libitum. Good management of sow feeding during farrowing and nursing is very important. Any diet left in the feeding trough 1 hour after feeding must be removed, and the trough should be cleaned. If a sow has not emptied her feeding trough within one hour after feeding, reduce her diet until her appetite is back. Always check the condition of the sow, and if the sow has problems keeping her weight, you might consider feeding three times a day.

When the piglets are 10–12 days old, they should be offered a small amount of the dry-pellet diet every day. Remove excess diet and adjust the amount according to appetite. Give the diet to the piglets on a clean floor surface or in a small trough, which the sow cannot reach. Use the same diet for sows as well as piglets.

## Weaning

Normal weaning age is 4-5 weeks but can be later if required. Piglet should have a minimum weight of 2.2 kg before you can wean them.

Newly weaned piglets should have 5-10 grams of diet per piglet, twice a day. Increase slowly over the next 5 days to 20g. Then feed according to the following table:

Week after weaning	1	2	3	4
Diet per piglet (g)	20	50	80	100

It is important to keep an eye on the feeding pattern and adjust accordingly. Remove any diet not eaten after one hour. Clean and disinfect the troughs after each feeding.

Because of the change in diet and the stress caused by the weaning process, the piglets can develop diarrhoea. Typically, this will occur 5 to 12 days after weaning. To deal with diarrhoea, reduce the amount of diet and offer probiotics like yoghurt or products like ZooLac® or Pro-Kolin+. In severe cases, the use of antibiotics might be indicated.

The sow will get 250-300 grams of diet twice a day after weaning. Check for mastitis the following days.

## Cross-fostering

Cross-fostering can be done to equalize litter size and/or for research purposes. It can take place any time within the first 48 hours after birth as long as all piglets have had milk (colostrum) and their umbilical cord is dry. Remove the largest piglets from the largest litter and mix them in a small warm area (1000-2000 cm<sup>2</sup>, 34-37°C) with the piglets from the smaller litter they are cross-fostered to. The mixed piglets should remain together for about 30 minutes. Two or three minutes before the piglets are returned to the sow, you can give the sow ½ ml oxytocin (10 IU/ml) IM in the neck muscle. This will provoke milk production, and she will accept the new piglets - also because they now smell like her own piglets. It is imperative to observe the situation for a while and make sure the piglets are accepted.

