

Pig Health - Handling Boar Semen on Farm

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Artificial insemination now forms a major component of the pig breeding programme of many farms.

As service is the start point of production in the breeding herd, any problems that arise with the process of insemination will have dramatic effects on the output of the herd. There is no inherent reason why artificial insemination should not give as good results as natural service but, unfortunately, problems frequently occur which undermine results.

It is common practice for semen samples to be assessed in the laboratory before dilution and despatch. Characteristics examined and graded would include volume, colour, density (number of sperm per ml) and motility and morphology i.e. the shape and character of individual sperm cells. In the commercial sector, the bench mark would be to provide a minimum number of sperm per dose (usually $2-3 \times 10^9$ sperm per dose ie 2-3 billion/dose) with a minimum of 50% live normal sperm. On farm collected semen is rarely assessed to the same standard. However, unfortunately it is not actually possible to assess the ability of the sperm to survive and fertilise the eggs and thus it is possible that an apparently normal ejaculate will fail - in exactly the same way as it would by natural mating. Because a large number of doses may be derived from a single collection, the impact on the herd of a substandard ejaculate will be exaggerated. This can be a particular problem with on-farm collection in the smaller herd where only 1 or 2 boars are collected each week. Pooling of semen - the mixing together of 2 or more ejaculates from different boars will tend to reduce the risks of problems. In the larger herd, unless there is a specific reason for sole mating, cross serving i.e. using semen from different boars in the 2 or 3 insemination per heat period is sensible.

Lifespan

Undiluted semen kept at body temperature will only survive a few hours. It, thus, requires processing during which it will be diluted down. The purpose of this diluting (or "extending") are three fold:-

- 1) To provide a nutrient medium on which the active sperm can feed and, therefore, prolong their life.
- 2) To allow distribution of semen

- 3) To increase the number of "doses" that are yielded from a single collection. In the on farm situation, it is normal to dilute semen to a ratio of between 1:4 and 1:10. In the commercial AI laboratory, dilution rates will be determined by the concentration of the ejaculate, diluting down to give the required number of sperm in each 70-80ml dose.

There are a range of diluents or extenders available which may claim 4, 5 or even 7 days life. It is firstly vital that the end user is aware of the stated lifespan of the semen - which of course starts at collection not at delivery on farm! The supplied tubes will normally have a use by date on the label. Irrespective of the claimed life of the extender, experience suggests that the best results are achieved by using semen within 48 hours of collection, although availability/delivery may not always make this possible.

Storage

Handling of the semen during storage on farm can have a dramatic effect on the inability of the product. Storage temperature is vital. If stored too warm, the sperm will be particularly active, using up nutrients at a faster rate, thus shortening the life. If too cold the sperm will die. The "ideal" storage temperature is 16-18°C consistent and any serious user of artificial insemination should have a temperature controlled box for storage complete with a maximum/minimum thermometer, which is checked daily. It is not good enough simply to store semen in the polystyrene box in which it was delivered! There appears to be little benefit in warming semen before use.

A tube or bottle of semen can be seen to be a "suspension" and over a matter of time the sperm will tend to settle to the bottom of the container. This will restrict access to nutrients of the sperm buried at the bottom. Whilst such problems are reduced with "flat packs" and "toothpaste tubes" stored on their side, compared to the old upright bottles, it is still advisable to gently agitate the tubes - do not shake! - to mix the semen and diluent every 8-12 hours to help preserve the life of as many sperm as possible.

Users should also be aware that commercially supplied diluents may contain a cocktail of low levels of antibiotics to minimise the multiplication of contaminant

bacteria during storage (the levels used are far too low to treat uterine infection existing at the time of insemination). This should be taken into account when considering disposal of empty vials and used catheters which will be contaminated with antibiotics in the same way as a used syringe albeit at very low levels

Use

The actual art of insemination is the subject for a whole paper in itself. However, briefly:-

1) There are several designs of catheter available - screw ended, sponges etc and, in general, the best available is the one that suits you! There are farms that will carry a range of catheters to suit different stockmen involved in inseminating.

2) Insemination must be a clean procedure. Do not open catheters with your teeth, which are generally heavily contaminated with bacteria! The lips of the vulva should be wiped clean of faeces prior to insemination using a clean tissue, wiping "down and out" rather than pushing faeces into the vagina.

As a final thought, there are a number of diseases that can be spread in semen e.g. PRRS, Classical Swine Fever. Veterinary liaison is necessary to ensure that semen is supplied to farm that is consistent with its health status.

Boehringer Ingelheim

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