

Choosing the best boar semen extender – short term or high performance?

In the swine industry, it is well known that semen extenders have been classified into Long, Medium and Short term preservation both for practical and commercial reasons. However, this classification does not seem to be such a good criteria for choosing the best extender for the boar stud anymore. The reason is that shelf life can be relative because there are other factors that have a direct effect on the conservation capacity of the diluents.

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The viability of semen doses may be compromised by the boar effect and other critical points such as their processing, handling, transportation, preservation and application, thus affecting the reproductive results of the sows. Commonly, semen doses are used for breeding in the first 72 hours after production and preferentially after 24 hours.

Among pig producers who inseminate with fresh 24-hour semen, the use of short conservation extenders such as BTS is widespread. This kind of extender maintains the properties of the sperm for 24 hours, up to a maximum of 72 hours of preservation. However, its capacity for semen preservation is limited since it cannot fully control the above factors. In addition, the fertilising capacity of semen diluted with several short extenders seems to be reduced when storage time exceeds three days.

As an alternative, long term extenders were developed, such as Duragen, Vitasem and others. The difference from the first extenders is the introduction of more complex buffering agents (such as HEPES, TRIS, TES and MOPS) and antioxidants (such as bovine serum albumin (BSA), cysteine, taurine, vitamin E, ascorbic acid, superoxide dismutase and glutathione etc).

Waberski et al., (1989) showed that BSA improved sperm motility and

acrosome integrity in long term conserved sperm. Since then, several long term extenders include this molecule. Nevertheless, in 1991 this researcher also demonstrated that BSA induced a temporary decrease in membrane fluidity which was difficult to interpret.

Despite the beneficial effect of BSA, this molecule may promote capacitating of sperm during semen conservation until five days. This evidence could explain why BSA improved fertility when the semen was stored between three and five days only.

Innovative formulation

Magapor's extenders Duragen and Vitasem are described as high performance extenders because of their innovative formulation. Their importance in the porcine industry is recognised by the most demanding technicians and pig producers from all around the world. They offer maximum protection and are the efficient solution for critical moments which allow to maximise the fertilising capacity of semen doses in artificial insemination and decisively influence the productive results of pig farms.

As commercial extenders, their exact composition can not be described, but they contain an efficient energy precursors source, protecting substrates against thermal shock, specific biological buffer salts, basic salts, antioxidants, stabiliser and antibiotics. Moreover, the formulation does not include any animal origin component (BSA, whey proteins, phospholipids, cholesterol, etc).

The use of Duragen and Vitasem becomes more extensive because its competitive high performance mitigates factors of influence on semen conservation. It is not just question of conservation time but a matter of safety and efficiency.

Hence, safety encourages many pig breeders to use these extenders nowadays for short term use to face any eventual problem of sperm conservation. Many studies have proven the efficiency of both extenders in comparison to differ-



ent commercial ones. Pinart et al., (2015), reported that in husbandry-controlled conditions, no differences on pregnancy rates and litter size were found between short term and long term extenders (BTS vs Duragen), despite the differences in preserving the sperm quality by Duragen. This trial was carried out in optimal and controlled conditions described as follows:

Traditional cervical insemination after 36-48 hours of heat detection; hormonal synchronisation of sows; insemination in groups of 300 sows per month and only females of five to eight cycles; insemination only during six months from January to July (excluding stressing months); temperature control of semen storage monitored by data logger; semen doses not contaminated; trial with selected 30 Landrace boars of the same age, from the same boar stud and with high semen quality; and finally semen collection and handling carried out by the same operator.

The results of this trial were expected as in controlled condition, short or long term extender should give no differences in reproductive results. However, in commercial farms, it is not possible to offer such condition of experimentation where the influencing factors described above are present. For this reason, high performance extenders such as Duragen and Vitasem were developed to overcome all problems of sperm conservation and storage.

Despite many trials and reports by several pig producers, Magapor

recently carried out a trial in nine different farms from the area of Cinco Villas in Aragón, Spain. In this work, 4464 sows were inseminated with semen doses conserved at 24h with Duragen and BTS in commercial conditions (not controlled).

Inseminations were performed weekly during the whole year. The results of fertility were significantly higher using Duragen than BTS (P-Anova=0.038).

The total born piglets was higher in three farms with Duragen (P<0.0001), but no differences were registered in the rest of the farms. The registered differences reflected the real conditions of conserved semen use in commercial farms.

Conclusion

The use of short term semen extender is still the preference in many countries where the election is based on price and not on safety or efficiency.

In countries where the pig industry is more efficient and competitive, farms are largely modern and the use of latest technologies is more extended, the use of semen extender should offer efficiency and safety.

Both characteristics and parameters are present in high performance extenders such as Duragen and Vitasem and not in short term ones. The choice of the best extender in this sense is clear. ■

References are available
from the author on request