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Minitube Artificial Breeding Seminars – Bendigo Day 1

By GRAEVE POPE, Graeme Pope Consulting, Nuriootpa

The two days of pig reproduction and artificial breeding seminars presented by Minitube Australia in Bendigo, May 22-23 were well attended by industry.

Alan Smith, Minitube’s Managing Director structured the program to meet the needs of both mating shed and boar stud/AB Centre staff, with Day 1 focused on factors influencing AI fertility and Day 2 on producing high quality boar semen.

International speakers Drs Rudolf Grossfeld and Martin Schwall, along with Pieter Langendijk, Ben Hens and Graeme Pope left those present with no doubt that best AI results can only be achieved through well trained staff consistently using good quality semen and equipment.

Some AI checkpoints

Dr Grossfeld from Minitube, Germany covered essential checkpoints for successful artificial insemination (AI).

“On-farm semen storage temperature has a big influence on sperm survival and viability. Semen storage units must be capable of holding semen doses at a stable 16-18°C temperature, and have capacity to both heat and cool. They must also be large enough to allow airflow around all doses and should be operating at 17°C before semen orders are expected to arrive on-farm,” he said.

“Data loggers can be used to monitor and validate transportation temperatures, and semen doses should be transferred into the storage unit immediately on arrival at the farm. Then breeding staff should use a closed insulated box when taking doses into the piggery.

“The type of catheter to use is a personal preference issue amongst mating staff and the best equipment will only produce the best results if it is used correctly. A boar placed in front of the sow will promote contractions to spread-up the insemination, especially for hands-free AI using breeding clamps.

“Ultrasonography can be used to reduce empty sow days and enable accurate decisions to be made regarding sow re-breeding or culling,” said Rudolf.

“For high accuracy, the first scan should be carried out at 25 days post-mating, and the second scan 30 days later. The aim is to identify sows with irregular returns before day 42.”

Optimal insemination strategies

Dr Pieter Langendijk, SARDI Senior Pig Scientist, Roseworthy discussed the effects of heat detection accuracy, insemination timing and semen age on AI fertility results.

“A mature boar should be used to increase the frequency and strength of uterine contractions in sows just prior to insemination, and the oxytocin pulse he is able to generate can last for about 30 minutes, before the sow becomes refractory again,” said Pieter.

“For optimal timing of inseminations, we want sperm present in the tract when the sow’s eggs are also present,” he said.

“Provided the semen is not too old, it should last up to 24 hours in the uterus.

“Duration of oestrus is related to wean-to-oestrus interval, which varies between sows, and the moment of ovulation is related to duration of oestrus, but we can assume ovulation will take place at two thirds of oestrus”.

“The difficulty in recommending a standard insemination strategy is that there is variation between farms in oestrus duration, so different AI timing strategies are needed for different farms. But by using

Top: Industry consultant Graeme Pope. Above: Dr Rudolf Grossfeld with Dayaan Moon from Shepparton covers the essential checkpoints for successful AI.
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A retrospective analysis of a farm’s insemination timing based on each sow’s start and finish time of oestrus, or oestrus duration, we can design more accurate AI strategies for individual farms,” he said.

“But without these records, we have to rely on rules of thumb. If heat checks are conducted only once daily, then sows seen first on-heat at day 3 – 4 after weaning should be first inseminated 12 hours after first detected, whereas day 5+ sows should be inseminated when first detected in-heat.

“When heat checks are conducted twice daily, we would recommend day 3 – 4 sows be first inseminated 24 hours after first detected, day 5 sows at 12 hours after first detected, and day 6+ sows when first detected.

“Trials conducted during both summer and winter on a number of SA farms have shown good quality semen extended with long term extenders Androfert and Androstar can be used for up to four days after collection and still achieve satisfactory fertility results,” he added.

On-farm AI Audits

Industry consultant Graeme Pope, Nutrioopa presented results obtained across several SA farms participating in on-farm AI audits conducted by Pieter Langendijk and himself.

“At these audits we look into all aspects of managing semen transportation, its storage and handling on-farm, heat detection practices, use of boars, number and timing of inseminations, sow aftercare and mating records,” said Graeme.

“We visit each farm twice, first on a routine mating day to see how piggery staff are managing their sows and semen, and then a follow-up visit to discuss our findings and recommendations.”

“We get staff to complete an oestrus duration record for at least 50 sows, which shows when heat was first and last observed for each sow, so we can then retrospectively see how their insemination timing related to assumed time of ovulation. We can then show which sows were probably mated too early, or too late, relative to when they would probably have ovulated, and so where mating labour and semen costs could be reduced through improved timing of inseminations,” said Graeme.

“We have found sows on some farms were regularly getting a third insemination, regardless of how long they had been seen on-heat. This was an unnecessary breeding cost and increased the risk of some sows not conceiving at all,” he added.

Trans-cervical AI

Dr Martin Schulze, R&D Director at the Institute for Reproduction of Farms Animals, near Berlin spoke on the uptake of trans-cervical AI using semen doses of only 0.3 billion sperm per piglet and that stud with only 20 boars covering the semen requirements of 6,000 sows.

“Farm staff heat check their sows using boars in the same way they normally would with traditional AI. Then they leave the sows for 1-2 hours before returning to insert a foam-tip catheter past the cervix, and then leave it there for 5-10 minutes before squeezing a 50ml semen dose containing only 1.5 billion total sperm down the catheter through the relaxed cervix in 20 seconds”, said Martin.

Sow health affects fertility

Dr Bernie Gleeson, veterinarian with Chris Richards & Associates, Victoria covered aspects of herd health affecting reproduction in Australian piggeries by first listing the range of bacterial and viral diseases capable of limiting sow fertility and stating that most diseases travel on or with pigs.

“We look into herd data when conducting an infertility investigation and often disease is an incidental finding. But it is both useless investigating poor production data and useless reporting on a poor investigation,” he said.

“Non-infectious health problems like sow lameness, poor body condition and sore feet can have a big effect on reproductive efficiency.”

“We are also looking into some novel uses for some exogenous hormones to assist thin or first parity sows to conceive, and to bigger liners, as well as to better synchronise ovulation to enable single, fixed-time inseminations,” Bernie added.

The Day 1 program concluded with a speaker’s panel Q&A session facilitated by Graeme Pope, which generated another hour of lively discussion amongst the audience.
Minisube Australia’s second day of pig reproduction seminars held at Bendigo on May 23rd re-introduced speakers Drs Martin Schulze, Rudolf Grossfeld and Bernie Gleeson, with the audience comprising mating shed and boar stud staff, commercial AB Centre staff and DIY on-farm semen collectors.

Dr Martin Schulze began by discussing aspects of boar stud management and critical control points in semen production, followed by his personal experiences through conducting AB Centre audits in Europe. Martin has audited 30 AB Centres holding 6,000 boars in Germany, Austria and Switzerland and analysed over 1,000 microbiological and spermatological samples since 2008.

“Annual boar stud replacement rates are usually between 40-60%, with the main culling reasons being over 60% for semen quality, 30% are libido related and 30% due to boar age”, said Martin. “Most European AB Centres now house their boars on bedding, especially sawdust, and manually feed them to increase the opportunity for staff to carryout daily boar inspections.”

“The boar’s housing environment should be stable. We target optimal temperatures of 12-25°C and humidity levels of 60-80%. Boar exercise is associated with improved ejaculate volume and sperm concentration. Boar diets with additives such as iron, vitamins A and B7, biotin, yeasts and fish oils are increasingly being looked at to boost sperm concentration”, he added.

“The collection pen should be designed to optimise semen collection efficiency, as well as being a safe workplace for collection staff.”

“Dummy sow design and the space available around CONTINUED ON PAGE 26 [>
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it. non-slip flooring, semen collections conducted at regular intervals by the same operator, avoidance of second ejaculates and reducing boar distractions or rushing will optimise boar reaction and ejaculation times.

“An efficiency target with collecting boars manually would be 5-6 boars per hour, with ejaculate times of 5 minutes,” said Martin.

“Warm-up pens located next to collection pens help to reduce boar reaction times and minimising the distances travelled between the boar’s normal housing pen and collection areas will reduce boar handling times and staff fatigue. The use of raised boar ‘milking pits’ and auto-semen collection systems can also assist in improving boar throughput.

“Semen quality is set in the collection pen,” said Martin, “so staff should massage the boar’s prepuce and discard the first fraction of the ejaculate to reduce the level of bacterial contamination in the collected ejaculate.

“All equipment and surfaces coming into contact with the ejaculate should be pre-warmed to 37-38C to avoid sperm shock and death.

“High quality, clean semen analysis and processing equipment will maximise semen dose shelf life.

“AB Centres should aim for maximum hygiene and minimum contamination when handling ejaculates and can check on standard work practices by laboratory testing 3-5 ejaculates each week for bacterial content and sensitivities, ensuring a good separation exists between boar collection and laboratory areas, and elimination of water baths and glassware.

“One-step dilution of ejaculates is best for sperm motility and semen doses should follow a 4C per hour cooling curve before being packed for transportation.”

Dr Schulze’s parting advice was “you know when you are producing a quality product if the customer comes back and not the product!”

Dr Bernie Gleeson, veterinary consultant to PorkSorks presented his views on aspects of boar management affecting semen quality.

“Lameness, sore joints, general aches and pains and the consistency of the boar’s environment can all impact on semen quality.

“We have had some success in improving feet structure by walking boars through copper sulphate foot pads,” he said.

Dr Grossefeld then presented a video showing the high standard of quality management procedures implemented by Minitube Germany in the manufacture of their semen extenders.

A final speaker’s Q&A session followed before Alan Smith, Minitube Australia officially closed the two-day program.

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