The introduction of an automated semen collection system into boar studs

Introduction

Boar Studs and Swine Artificial Insemination (AI) Stations are faced with the challenges of staff turnover. This can be attributed to the fact that boar semen collection is associated with a poor social image and that it is a repetitive, time consuming job which over time causes staff burnout and / or injury. As a result the productivity of the Boar Stud and AI station suffers greatly. One way to solve the problem of staff turnover in the collection barn is to incent skilled workers by making their job more "user friendly" and efficient. Minitube has developed a semi-automatic collection system to aid in the process of boar semen collection called the BoarMatic. The BoarMatic has advanced the process of collection by improving labor conditions, reducing the risk of job related injuries such as carpal tunnel syndrome, and most importantly has improved the productivity and quality of the semen collection.

BoarMatic Features and Benefits

1. Improved efficiency during collection

Using the BoarMatic saves approximately 70% on the overall labor of the collection process compared to conventional methods. This time savings allows for more boars to be handled for collection by worker per hour. The manual method of collection will yield approximately 5 boars/hour, whereas by using the BoarMatic the same operator will collect semen from roughly 8.5 boars/hour.

2. Collection hygiene is optimized

The BoarMatic utilizes an artificial cervix (AC) system, which consists of a double bag connected to the collection cup. By using the AC the penis tip and the collection cup remain protected, reducing the risk of bacterial contamination.

3. Boar comfort

The interdigitating prominences on the AC mimic a sow's cervix, making it easy to train boars of any age. The combined action of AC and inter-digitating prominences create the necessary stimulus for ejaculation. The BoarMatic design permits the boar to have the ability to move back and forth during ejaculation and also to feel comfortable during the overall collection process.

4. BoarMatic is easy to install and adapts to most collection room layouts

The BoarMatic does not require any electrical installation or the use of an air compressor, making it easy to install in any location. More than one BoarMatic can easily be installed in a pre-existing collection area. This improves efficiency by reducing operator movement so that more boars can be collected within a given time period.

5. Easy maintenance

BoarMatic is easy to clean and disinfect and requires very little routine maintenance.

FIELD TRIALS

Trial 1: Optimizing collection process and semen quality with the BoarMatic System

In this trial, 9 boars of different lines and age groups were used. They were collected by the traditional gloved hand method and with the BoarMatic. A CASA System was used to establish concentration and motility of each ejaculate. Bacteria culture samples in blood-agar media were taken from gloves, AC's and the collected semen. No differences were found in seminal motility and concentration. Ejaculates collected with BoarMatic tended to have less numbers of bacteria colonies compared to the gloved hand system (Table 1).

	BoarMatic	Gloved hand method
AC/gloves	94.1	97.4
Ejaculate	19.6	28.5

Table 1: Number of colonies forming after a 24 hour culture period incubated at +37ºC

When comparing this data to a real production operation (increased number of boars, more lines, and varying differences of boar age), we would expect the BoarMatic to show an even greater advantage due to the increased pressures of production and the varying skill levels of each collector.

Trial 2: Installation and operation start-up. Experiences in Spain and USA

Table 2 shows the efficiency of the collection process following the installation and introduction of BoarMatic into a boar stud. An immediate reduction in the number of collection operators along with a short adaptation period was seen in all three studs.

Number of BoarMatic Systems	2	4	8
Localization of AI-Station	Spain	Spain	USA
Number of boars	55	260	500
Adaptation period to BoarMatic	1 month	2 months *	1 month
Boars collected with BoarMatic	98 %	95 %	92 %
Semen quality after BoarMatic	better	equal	better
Boars collected/h	7**	8	8
Collection operators prior to BoarMatic	2	3	6
Collection operators after BoarMatic	1	2	4

Table 2: Results of introduction and operation startup using the BoarMatic System in boar studs.
** new boars and new operators ** not functional design of facility*

Trial 3: User feedback regarding the BoarMatic System

1. How did the previous collection dummy differ from the BoarMatic dummy?

- Spain (2 BoarMatic): it was completely different and movable
- Spain (4 BoarMatic): it was a very similar dummy
- USA (8 BoarMatic): it was also a Minitube dummy

2. Was semen collected in a collection area or in the boar stall?

- Spain (2): In the boar stall.
- Spain (4): In the collection area.
- USA (8): In the collection area.

3. How long did it take for the boars to get used to the BoarMatic dummy?

- Spain (2): around the second or third collection.
- Spain (4): around the second or third collection.
- USA (8): around the second collection.

4. How long did it take for the collection operators to get used to the BoarMatic dummy?

- Spain (2): the operator adapted immediately, having a positive attitude from the beginning.
- Spain (4): the new boars and the new operators adapted themselves from the beginning. The rest of the operators had no problems.
- USA (8): Within two days of production.

5. Has BoarMatic improved efficiency of semen collection? How?

- Spain (2): Yes, we have reduced labor.
- Spain (4): Yes, we have improved speed compared to the gloved hand system.
- USA (8): Yes, we have improved speed and reduced labor. Now it is possible to have all collection crates working at the same time.

6. What is the average collection time from the time that the boar enters the collection area to exiting?

- Spain (2): about 8 minutes.
- Spain (4): about 10 minutes.
- USA (8): about 5 to 8 minutes, depending on the boar

7. How many boars/hour, can one operator collect using 2 BoarMatic dummies?

- Spain (2): 7-8/hour, because the design of the collection room is not ideal.
- Spain (4): 8/hour.
- USA (8): 9-12/hour.

8. Have you seen any differences in semen quality (volume, concentration, motility, contamination)?

- Spain (2): there was no change in the number of semen doses, but the reduction of contaminants is evident.
- Spain (4): we haven't found differences compared with the manual collections.
- USA (8): higher volume and a trend to better motility. Contaminants haven't been analyzed, but presumably they are less.

9. What is your general opinion about the BoarMatic?

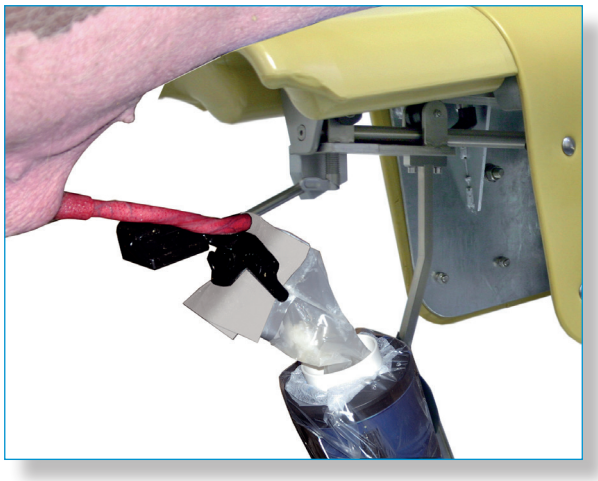
- Spain (2): it is a good working instrument, which increases the number of collections performed by a technician in one hour with less physical labor. In addition, it assures good working security.
- Spain (4): for me, it seems to be a good system which increases the speed of semen collection, performing up to 8 collections/ hour. It is a good idea that the semen does not have contact to the environment during the collection.
- USA (8): it is one of the major pieces of equipment contributing to the overall productivity of the stud.

10. If you have already used other automatic collection systems, why did you decide to change to the BoarMatic?

- Spain (2): -
- Spain (4): because you do all operations per hand, it doesn't require electrical or any other kind of installation. This is one of the advantages.
- USA (8): -

11. Would you recommend the BoarMatic?

- Spain (2): yes, indeed
- Spain (4): yes, labor savings and collection speed is evident
- USA (8): yes, it is an investment which is amortized quickly



CONCLUSIONS

The BoarMatic System saves up to 70 % in time and labor costs.
BoarMatic reduces bacterial contamination and therefore increases the quality of semen.
The boars collected with BoarMatic produce quality ejaculates with normal volume and quality.
The animals adapt quickly to the system and overall collection process.

LITERATURE

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