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Effect of the Type of Straw on the Spermatic Quality in the Freezing of Boar Semen

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Abstract: With the freezing boar semen, could have better options for the optimization of the reproductive handling in the swinish species as well as an alternative for the development of this cattle activity; using technologies like the implementation of banks of frozen of races with characteristic zootechnic of economic importance that guarantee the readiness of germinal material in the moment that is required, to have germinal material of males proven genetically, still when the animal no longer exists, to overcome certain intentional restrictions of transport of alive animals, for the problem of transmission of illnesses and, to overcome the restrictive of time of viability of the diluted fresh semen. In this work was examined the effect of the freezing boar semen in straws plastic of 0.5 and 5 mL on the Motility and the Acrosome Integrity (NAR). For it, 9 were used ejaculated of different animals, the experiment was carried out comparing fresh semen with thawing semen coming from straws of 0.5 and 5 mL. The results of percentages of motility and NAR for fresh and thawing semen, were of 86.19, 47.14 and 47.14, for straws of 0.5 mL and 75.62, 48.19 and 46.81, for straws of 5 mL. When carrying out the analysis of the variance and the test of multiple comparisons it was found that the freezing of the semen in both straws types, the percentages of motility and NAR reduce, with regard to the fresh semen; however, the macrotubes or straws of 5 mL, represent a good option in the artificial insemination using boar semen frozen-thawing.

Key words: Freezing boar semen, seminal quality, spermmatic motility, acrosome damage, straws types

INTRODUCTION

The practical use of frozen boar semen, is even reduced[1-4]. Their use has been limited, due mainly to the drop spermatic survival (30-40%) and to a smaller fertility, compared with the use of fresh semen. With the freezing of the hog semen, he/she could have better options for the optimization of the reproductive handling in the swinish species. The technology of the freezing of the hog semen, represents an alternative, among which are: a) establishment of banks of frozen semen of races or lines with characteristic zootechnic of economic importance that guarantee the readiness of germinal material in the moment that is required, b) to Have germinal material of males proven genetically, still when the animal no longer exists, c) to overcome certain intentional restrictions of transport of alive animals, for the problem of transmission of illnesses and, d) to overcome the restrictive of time of viability of the diluted fresh semen[4,5].

The frozen semen, it has been used to great scale in the insemination of the bovine livestock; however, in the swinish livestock, it is still very limited; their use could be an alternative for the development and optimization of the swinish industry[4,5].

At the present time, one is working in strategies to improve the viability, fertility and prolificicacy of the sows inseminated with frozen semen; however, the results at field level, still present certain restrictive ones. Reason why it is necessary to continue working in this respect to improve the results at level of Unit of animal Production[3,5].

The objective of this work was to value effect of the freezing boar semen in straws plastic of 0.5 and 5 mL on the Motility and the Acrosome Integrity (NAR).

MATERIALS AND METHODS

Collection of semen and analysis of the semen in farm: The collection of semen was carried out by means of the technique of gloved hand gathering the semen of 9 boar in a tube collector was carried out the evaluation of macroscopic routine (color, scent, consistency, pH and volume); the volume was measured with a test tube graduated in mL. The motility was analyzed placing a drop of the sample on slide, previously heated in a thermal plate whose temperature was of 37°C, covered with a cover slide and it was observed to the microscope at 20 and 40X. The results were expressed in percentage, of 0 at

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100. The quality of the movement was evaluated in a scale from 0 to 5.

The percentage of normal acrosomes (NAR), it was analyzed by means of the technique indicated for[6]. A drop of semen was placed diluted in 1 mL of solution of citrate of formol to 3%. The sperms were observed to the microscope with the immersion objective, 100X, 100 sperms were analyzed by sample.

Of equal it forms, the concentration of sperms was evaluated with the camera of New bauer. For took it a sample of semen of 1 mL, it was diluted in 100 mL from a formol solution to 3%.

The one ejaculated was diluted to reason of 1:4 with the commercial diluter MRA to 37°C, in the first 15 min after the collection.

To the alone Laboratory a volume of 80 mL was transported with 3000 X 10^6 sperms to carry out the corresponding valuations. The rest used it the farm for Artificial Insemination.

Analysis of the semen in the laboratory: The semen prediluted was balanced during 1 hour to ambient temperature[7]. Was carried out the valuation of motility and NAR. For the freezing, the samples were used whose motility in cool air was bigger than 80 and 70-80% of NAR.

Freezing of the semen: The freezing of the semen was taken based on the method described by Martin *et al.*, [7], in straws of 0.5 and 5 mL.

For the freezing the First diluter was elaborated (diluter A), 11 g of lactose and 20% of egg yolk in 100 mL dilute. Second diluter (diluter B), 11 g of lactose, 20% of egg yolk, 4 % glycerol in 100 mL dilutes.

The straws of 0.5 and 5 mL stayed during 20 minutes in vapors of Liquid Nitrogen (gassy phase), to 3 cm of distance of the liquid phase of the container. Later on they dove in the liquid phase, where they were stored until it became necessary the unfreezing.

Unfreezing of the semen: The straws of 0.5, was defrosted in Bathroom at 42°C during 12 seconds and those of 5 mL at 50°C during 40 seconds. After the thawing, it was analyzed the motility and NAR.

RESULTS

In the Table 1, the results of motility and NAR are presented obtained with fresh semen. The Table 2, it shows the obtained results of motility and NAR with semen frozen-thawed in straws of 0.5 mL.

The results of Motility and NAR obtained with semen frozen-thawed in straws of 5 mL, are presented in the Table 3.

Table 1: Motility and NAR with fresh semen

Eyaculated	Motility (%)	NAR (%)
1	80_4	70
2	90_4	80
3	80_4	75
4	90_4	78
5	80_4	75
6	90_4	80
7	80_4	70
8	90_4	80
9	90_4	80
Mean±MSD	85.26±5.27	76.23±4.18

[4]Motility´s quality

Table 2: Motility and NAR with semen frozen-thawed in straws of 0.5 mL

Eyaculated	Motility (%)	NAR (%)
1	40_3	48
2	50_3	50
3	40_3	45
4	50_3	50
5	50_2	55
6	40_3	48
7	50_3	40
8	60_3	60
9	40_2	50
Mean ±MSD	45.76±7.07	48.98±5.65

[2 y3]Motility´s quality

Table 3: Motility and NAR with semen frozen-thawed in straws of 5 mL

Male	Motility (%)	NAR (%)
1	50_3	50
2	50_2	55
3	40_2	48
4	40_2	50
5	60_3	55
6	40_3	50
7	60_2	50
8	40_2	35
9	40_2	55
Media±MSD	45,37±8.66	48.92±6.15

[2y3]Motility´s quality

In the Table 4, the results of motility and NAR are shown obtained with fresh semen, frozen-thawed in straws of 0.5 and 5 mL.

It was found that it doesn't exist differs statistically significant ($p<0.05$) between the thawed semen coming from straws of 0.5 and 5 mL.

DISCUSSION

In the freezing of boar semen, the broadly used straws is those of volume of 5 mL, however, its present certain cryobiologic problem, such as the cooling speed and unfreezing, which can vary through the same straw, among the outlying and central part[2].

Nevertheless, with regard to the speed of thawing, it seems that a smaller heating speed can exist in the center of the straw, with regard to the periphery[3], that which can rebound in the spermatic survival after the thawing.

The heating speed in the outlying part of the straws of 5 ml is of quicker 3.75 times that in the central part [1,3].

Table 4: Means±MSD of the variance analysis for motility and NAR of fresh semen and semen frozen-thawed in two straws´s types

Variable(%)	N	Fresh semen	Frozen-thawed Semen 0.5 mL	Frozen-thawed Semen 5 mL	MSD straws of 0.5 and 5mL
Motility	9	85.26±5.27	45.76±7.07[a]	45.37±8.66[a]	0.27[a]
NAR	9	76.23±4.18	48.98±5.65[a]	48.92±6.15[a]	0.04[a]

[a]In the same column and line means that it doesn't exist differs statistically significant

However, for the straws of smaller volume like the 0.25 and 0.5 mL, the difference in the heating speed with regard to the periphery and central part, is only of 1.36. These differences reached in the speed of heating of the central and outlying part of the straws are probably due to the fact that the semen thawed in the outlying part, avoids a flow of quick heating toward the central part[1,3,5].

With regard to the above-mentioned, in 1991, Hofmo and AlmLid, the same as Peláez *et al*., in the 2002, they mentioned that the semen of frozen hog in small straws can be in a better quality as for the motility after the thawing.

CONCLUSION

Although significant differences don't exist among the motility and NAR of semen frozen-thawed in straws of 0.5 and 5 mL, the results obtained as for the macrotubes (straw of 5 mL) concentration for the freezing, indicate that these could be a more practical alternative in the artificial insemination of the swinish species, using frozen-thawed semen.

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