Evaluations of the cryopreserved imported bovine semen from three artificial insemination companies

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Introduction

The cryopreservation process and/or thawing can to induce many alterations in mammalian spermatozoa, such as the motility decrease and alteration of membranes (1). The objective of this study was to conduct a series of sperm evaluations in imported cryopreserved bovine semen, from three different artificial insemination (AI) companies to determine the quality of genetic material imported by Brazil.

Materials and Methods

Samples of imported cryopreserved semen of nine Aberdeen Angus bulls from three insemination companies (A, B, C) were used. The straws were thawed at 36°C/30 s and the following parameters were evaluated: a-Motility and vigor: triple subjective evaluation; b-Concentration in Neubauer chamber; c-Morphology by phase contrast (PC) microscopy; d- Fast thermoresistance test (TRT) (46°C/30 min); e-Plasm membrane integrity (PMI) by fluorescent probes (PI-FDA); f-Acrossome integrity by fluorescent probes (FITC-PNA-PI).

Results and Discussion

The results of concentration, motility and vigor of thawed samples were considered appropriated and were not different among the companies (Table 1).

Table 1. Comparative evaluations of sperm concentration (x 10^6 cells/mL), motility (%) and vigor (0-5).

Parameters	Company A	Company B	Company C
Concentration	28.66 ± 7.26	30.15 ± 10.44	25.79 ± 11.46
Motility	67.49 ± 8.70	64.44 ± 8.54	73.88 ± 0.96
Vigor	2.88± 0.19	2.99 ± 0.33	3.11 ± 0.19

Table 2. Comparative evaluation of sperm morphology by PC (%).

Abnormalities	Company A	Company B	Company C
Head	18.66 ± 9.43	5.00 ± 2.64	10.33 ± 11.42
Midpiece	2.83 ± 1.25	1.50 ± 1.32	2.66 ± 2.02
Tail	10.50 ± 1.32	9.66 ± 2.36	16.33 ± 7.52
Total	32.0 ± 9.50	16.16 ± 6.21	29.33 ± 9.54

The average results of sperm morphology evaluation were not significant different between the AI Companies (Table 2). However, considering the individual results, in Company A one bull was identified with 29% of head defects and in Company C one bull was identified with 23,5% of head defects and other bull with 25% of tail defects. These results indicate the lack of quality in sample, which can lead to losses in artificial insemination. In the TRT, the final motility of Company C was 44,99 ± 6,00%, not differing from Company A (25.27 ± 11.91%), and higher than to Company B (8.22 ± 4.59%). The final motility after TTR from Company B is considered low for a sample of quality. This result may have been influenced by the cryoprotector medium used, because all animals evaluated showed low motility after the TTR. It was observed 43,16 ± 24,60%, 51,16 ± 17,29% and 44,83 ± 15,44% of spermatozoa with intact plasma membrane, respectively for AI Companies A, B and C, not differing significantly among them. The evaluation of acrosome integrity demonstrated that 26,66 ± 6,00%, 37,66 ± 11,15%, and 30,00 ± 18,08% of sperm presented an intact acrosome, respectively for AI Companies A, B and C, not differing significantly among them. These results indicate that cryopreservation process used for these AI companies preserved sufficiently the sperm plasma membrane and the acrossomal structure.

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References: (1) Ball BA, Vo A. 2001. J Androl, 22:1061-1069.

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