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Effect of Freezing on Seminal Characteristics of Jersey, Sahiwal and their Halfbred Bulls.

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Various seminal attributes have been credited with fertility which appear to be affected by freezing process. Therefore, it is needed to observe the relative effect of processing frozen semen on these attributes. Hazards of semen freezing are not sustained alike by sperms of all the bulls as viability and morphology of the spermatozoa depends upon individual bull's resistance. The effect of freezing on spermatozoal motility, live per cent, abnormalities, biometry and glutamic oxalacetic transaminase (GOT) release was studied in Jersey (J), Sahiwal (S) and 1/2J 1/2S bulls semen.

MATERIALS AND METHODS

Fifteen healthy breeding bulls with mean age of 6 years, maintained at the Central Semen Station, Bhopal, belonging in equal number to Jersey, Sahiwal and 1/2J 1/2S were included in the study. Of the 10 ejaculates per bull, 6 with optimum seminal qualities were frozen. The semen was diluted using Triss buffer, maintaining 120 millions sperm per ml. The semen was filled in 0.25 ml mini straws and frozen (Willadson, 1979). The sperm motility, live per cent, abnormalities and biometry were assessed just before and 7 days after freezing using vital staining technique (Campbell *et al.,* (1956). For the same periods GOT release in seminal plasma was also measured after Yetzidis (1960).

RESULTS AND DISCUSSION

The per cent mean individual motility / live sperm / abnormal sperm were 79.80±0.01/84.40±0.01/2.03±0.01 in neat semen which changed significantly ($P < 0.01$) after glycerolisation to 69.10±0.01/70.86±0.01/2.70±0.01. The same further dropped significantly ($P < 0.01$) following freezine to 55.23±0.01/52.90±0.01/3.90±0.01. The post thaw motility corroborates with the finding of Robbins *et al.,* (1976). The change in sperm structure following freezing may be due to ultra low temperature. The effect of glycerolisation and freezing is widely affected by factors like thawing temperature, glycerol percentage in diluter and leakage of proteins by acrosomal injury (Mann and Mann, 1981).

The overall length of spermatozoal head/tail was 9.65±02/60.27±0.51 μ in neat semen which dropped to 9.47±0.02/59.06±0.62μ after glycerolisation and to 9.48±0.02/58.03±0.42μ after freezing. The effect of glycerolisation and freezing was identical in all the three groups. Erickson *et al.,* (1954) stated that spermatozoa were damaged during freezing and thawing procedure. Improper freezing procedure may change the acrosome and cell membrane resulting in the loss of enzymes

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from the spermatozoa. The freezing is injurious to acrosome and protein leakage is the cause of decrease in the size of spermatozoa.

The total GOT release in the seminal plasm due to freezing was significantly different ($P < 0.01$) in Jersey (183.23±5.41/ml), Sahiwal (245.33± 7.34/ml) and ½J ½S (226.07±5.57/ml) groups. Other workers also reported rise in the GOT level in the seminal plasma of the bull semen due to freezing. Kaker and Arora (1973) concluded that individual variation among bulls in GOT concentration might be due to difference in sperm concentration. Some workers found a highly significant extra cellular GOT release as a result of cold shock (Gupta and Shrivastava, 1985). The coefficient of correlation was significantly positive between GOT release and live sperm per cent. The correlation with semen pH was significantly negative. There was a nonsignificant positive correlation of GOT leakage with reaction time, semen volume, individual spermatozoal motility and per cent abnormal sperms. The correlation was non-significant and negative between GOT leakage, sperm concentration and mass motility.

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