

*Short Communication*

STUDY ON EFFECT OF THAWING TEMPERATURE IN SPERM MOTILITY AND CONCEPTION RATE IN INDIGENOUS KANGAYAM CATTLE

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ABSTRACT

The present study was undertaken to study about the sperm motility and conception rate in Indigenous Kangayam Cattle at different thawing temperature. In 35°C of thawing temperature higher post thaw motility of sperm and conception rate was observed and lowest post thaw motility of sperm and conception rate was observed at 25°C of thawing temperature.

KEY WORDS: Thawing temperature, Sperm motility, conception rate, Kangayam Cattle.

INTRODUCTION

The major disadvantage of cryo-preservation is during freezing and thawing spermatozoa face cold shock and a part of sperm population die. Thawing brings spermatozoa to their normal physiological state and able to fertilize the ovum. Recrystallisation occurs during slow thawing which is harmful to the spermatozoa, but fast thawing increases the survivability of spermatozoa. Different protocols for thawing have been evolved by various scientists but thawing of frozen semen at 35-40 °C for 30 seconds is well accepted (Anon, 2005). The present experiment was designed at 3 different thawing temperatures of 25 °C, 30°C and 35 °C for 30 seconds in order to assess post thaw semen motility and conception rate.

MATERIALS AND METHODS

The present study was undertaken in the dairy farmer fields of Erode during the period of June 2018 to December 2018. Three good freezable Kangayam bulls (K 42, K 39, K 33,) semen straw belonging to organized semen bank were used for this study. From each bull 200 straws were used for artificial insemination at owners door step .The cryopreserved semen straws were thawed for Artificial insemination at 25°C, 30°C and 35°C. The fertility of experimental bulls semen straw was assessed on the basis of actual conception rate known through pregnancy diagnosis carried out between 45-60 days of post insemination by per rectal examination.

RESULTS AND DISCUSSION

The fresh semen collected from the all three experimental bulls revealed that the mean volume ranging between 5.00 to 5.25 ml. The average rating of mass motility was more than three on 0-4 scale (3.12 - 3.84). The concentration of

sperm ranged between 1280-1310 millions per ml. From fresh semen and at different thawing temperatures the sperm motility per cent in all the three bulls recorded are presented in Table I while the overall conception rate at different temperatures of thawing and the corresponding chi-square values are presented in Table II.

In fresh ejaculates of all experimental Kangayam bulls the motility per cent was 74.17 ±1.26 (Moharatha, 2001). At thawing temperature of 25°C, 30°C the post thawed sperm motility percentage was observed to be 33.11 ±0.97, 40.73 ±2.18, 49.39 ±1.79 respectively. The post thawed motility at 35°C is in consistent to the finding of onkarappa *et al.* (1990). Post thawed motility of semen obtained from all three bulls increased linearly from 25 degree Celsius to 35 °C .The variations in sperm motility in fresh and post thawed semen may be associated with technique employed along with motility loss following freezing and thawing, the change of environment, breed , individual variation and depends on age group.

The findings of present study revealed highest conception rate (65.00%) in Kangayam cow was obtained at 35°C followed by 57.00% at 30 C and 31.00 percent at 25°C thawing temperatures irrespective of three Kangayam bulls semen straw was used. The conception rate in different thawing temperature of Kangayam semen straw was comparable with findings of Hultnaes, 1984 (69.10%, 35⁰C -38⁰C) and chinaiya *et al.*, 1988 (69%, 38⁰C and 59 % at 25- 30⁰C), Jondent *et al.*, 1980 (64.31 %, 35⁰C). The Chi-square analysis revealed a highly significant difference (P<0.01) between 25°C versus 30°C and between 25 degree and 30°C thawing temperature but conception rate was not significant between 30 degree Celsius and 35 °C.

TABLE I: Kangayam bulls post thawed sperm motility at different thawing temperatures

Thawing Temp	Motility (Percent)			
	Fresh	25 ⁰ C	30 ⁰ C	35 ⁰ C
Bull No.				
K-42	75.12± 0.95	35.12± 0.71	39.52 ±2.01	48.67± 1.23
K-39	73.29 ±1.20	33.50± 0.93	41.95± 1.30	53.29 ±0.95
K-33	74.10± 0.85	30.72± 0.65	40.74± 0.92	46.21±0.85
Overall	74.17±1.26	33.11±0.97	40.73±2.18	49.39±1.79

TABLE II: Kangayam cows conception rate at three different thawing temperatures and the corresponding chi-square values

Thawing Temp	25 ⁰ C	30 ⁰ C	35 ⁰ C	Chi-square value	Chi-square value	Chi-square value
	Conception Rate (%)	Conception Rate (%)	Conception Rate (%)	25 ⁰ C vs 30 ⁰ C	25 ⁰ C vs 35 ⁰ C	30 ⁰ C vs 35 ⁰ C
Bull No.						
K-42	31.00	53.00	61.00	27.32**	46.85**	3.19 ^{NS}
K-39	27.00	51.00	60.00			
K-33	28.00	57.00	65.00			
Overall	29.00	54.00	62.00			

** - Highly significant (P<0.01), ^{NS}-Non significant (P<0.01).

REFERENCES

Anon (2005) Minimum standard protocol for semen stations. New delhi, Govt of india, Ministry of Animal Husbandry and Dairing.

Moharatha, R.M. (2001) Studies on freezability and conception rate in breeding bulls. MV.sc. Thesis, OUAT, Bhubaneswar, Orissa, India.

Onkarappa, G.R., Devraj, M. and Honnappa, T.G. (1990) Indian Journal of Animal Reproduction. **20(2)**: 138-141.

Chinaiya, G.P. and Balakrishnan, M. (1988) Indian Journal of Animal Reproduction, **9(1)**: 9-13.

Hultnaes, C.A. (1984) World Anim. Rev., 52: 39.

Jondent, R. and Rabadeux, J. (1980) Elevage at insemination, **180**: 3-8.