General Impact Factor (GIF): 0.875
Scientific Journal Impact Factor: 1.205

e- ISSN: 2394-5532
p- ISSN: 2394-823X

International Journal of Applied And Pure Science and Agriculture

www.ijapsa.com

Effect of different extenders on the quality of poultry semen during preservation at 4 – 5^0c*

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ABSTRACT

Poultry semen collected by abdominal massage method from five Indigenous and five Van raja chicken were used to study the effect of three extenders on the quality of semen during preservation at 4-5^{0}c up to 72 hours. The overall mean sperm motility, live sperm count, total HOST reacted spermatozoa and intact acrosome with normal head differed significantly (P<0.01) between extenders and between preservation periods irrespective of genetic group. The interaction of extender and preservation was highly significant. The overall mean sperm motility, live sperm count, total HOST reacted spermatozoa and intact acrosome with normal head was significantly higher in EK extender than lake and skim milk extender but no significant difference was observed between lake and skim milk extender for both Indigenous and Van raja chicken. It can be concluded that EK extender could be used successfully for preservation of chicken semen at 4-5^{o}c up to 72 hours.

Key words : Semen preservation, poultry, extender

I. Introduction

Artificial Insemination has received considerable importance in developing poultry for commercial production. AI improves the egg hatchability and thus decreases expenses reducing males kept for breeding and more chicks are being produced at lower cost (Omparakash et al.,1992). AI in poultry reproduction has caused investigators to become interested in studying the semen characteristics of different breeds of poultry (Santiago-Moreno et al.,2009 and Haunshi, et al.,2010) and its preservation(Lake,1960;Sarkar et al.,1995 and Siudzinska and Lukaszewicz, 2008) for alleviating the unsatisfactory fertility problems. Extensive research works have been conducted and there are many extenders to preserve semen of farm animals. But suitable extenders are lacking to preserve the poultry semen with satisfactory result.The present investigation was undertaken to study the effect of different extenders on the quality of semen of Vanaraja and Indigenous birds of Assam during preservation at refrigeration temperature.

II. Materials and Methods

A total of 10(5 from each genetic group) sexually active mature cockerels of Vanaraja (2.5 to 4.5 kg bw) and Indigenous chicken of Assam(1.2 to 1.4 Kg bw) aged 6 to 7 months were reared intensively in individual cages to acclimatize with the cage system of rearing for one months. The cockerels were trained to respond to massage technique for 10 to 15 days as per method of Burrows and Quinn (1937). All birds were provided with laying mash diet. A total of 65 semen samples (35 from Indigenous and 30 from Vanaraja Chicken) were collected from each cockerels twice a week by abdominal massage method (Burrows and Quinn,1937). Immediately after collection the five ejaculates obtained from males of same breed were pooled and evaluated as one sample. The pooled semen sample was transferred to 2 ml vials and kept in a water bath at 37 ^{0}c. The samples were extended at a ratio of 1:4 with Lake extender (Lake,1960), Skim-milk extender(Van Wambeke, 1967) and EK extender(Lukaszewicz,2002)

using split sample technique. The diluted semen samples were placed in a refrigerator at 4-5^{0}c for preservation up to 72 hours. Each semen sample was evaluated for sperm motility, live sperm, Host reacted sperm and acrosomal integrity after preservation for 0, 24, 48 and 72 hours. The statistical analysis of data was done using software SPSS version 14.5.

III. Result and Discussion

The mean sperm motility of Indigenous chicken at 0, 24, 48 and 72 hours of preservation was found to be higher in EK extender (65.63±1.13, 58.13± 0.92,51.25±0.82 and 41.25±0.82 % respectively) than in Lake (61.88±1.32,16.25±2.06,00 and 00 % respectively). Similar observations were also observed for Vanaraja chicken. The mean sperm motility of Indigenous and Vanaraja chicken at 0 and 24 hours in EK extender in the present study was comparable with the findings (58.75±2.11 and 65.77±2.15 %) of Latif et al. (2005) and Tabatabaei and Aghaei(2011). The mean live sperm count of Indigenous and Vanaraja chicken at 0, 24, 48 and 72 hours of preservation were significantly higher in EK extender than in Lake and Skim milk extender. The mean live sperm count for 0 to 48 hours of preservation with EK extender obtained in the present study was similar to the findings of Donoghue and Donoghue (1997). The total hypo-osmotic swollen spermatozoa percentage at 0, 24, 48 and 72 hours of preservation of Indigenous and Vanaraja chicken was significantly ($P<0.01$) higher in EK extender than in Lake and Skim milk extenders. In both the genetic group higher percentage of total hypo-osmotic swollen spermatozoa was observed in EK extender at 24, 48 and 72 hours followed by Lake and Skim milk extender. The percentage of total hypo-osmotic swollen spermatozoa in EK, Lake and Skim-milk extender at 0 hour and in Lake and skim-milk extender at 24 hours in both the genetic group observed in the present study was in close proximity with that of Donoghue and Donoghue (1997). The mean percentage of intact acrosome with normal head in Indigenous chicken at 0,24,48 and 72 hours of preservation was found to be higher in EK extender(79.38±0.53,72.75±0.68,65.88±0.64 and47.88±0.64 % respectively) followed by Lake extender (74.75±0.98,30.30±2.35,00 and 00 % respectively) and Skim-milk extender (72.25±1.75,29.13±1.92,00 and 00 % respectively),whereas the corresponding value in Vanaraja chicken was also higher in EK extender (83.00±0.97,79.50±2.03,59.50±1.34 and 36.00± 2.29 % respectively followed by Skim-milk extender (66.67±2.39, 22.00 ±1.37, 00 and 00 % respectively and Lake extender (41.33 ±2.58,20.67± 0.67,00 and 00 % respectively. The intact acrosome with normal head, intact acrosome with swollen head and entirely lost acrosome with swollen head differed significantly between extenders. While incidence of intact acrosome with normal head was significantly higher in EK extender, it was significantly lower in Lake and Skim-milk extender. The incidence of intact acrosome with swollen head and entirely lost acrosome with swollen head were significantly lower in EK extender while they were significantly higher in Lake and Skim-milk extender.

The study of acrosomal integrity in Indigenous and Vanaraja chicken semen in different extenders for different hours of preservation till 72 hours at 4 – 5^0 c involving the categories of intact acrosome with normal head, intact acrosome with swollen head and entirely lost acrosome with swollen head as followed in the present work was apparently carried out for the first time and was not found in earlier reports and hence the magnitude of incidences of acrosomal integrity based upon the present categories obtained in the present study could not be compared due to non availability of similar literature. Further research work on acrosomal integrity of chicken spermatozoa is warranted.

IV. Conclusion

The overall mean semen characteristics of chicken was better in EK extender than lake and skim milk extender . It can be concluded that EK extender could be used successfully for preservation of chicken semen at 4-5^{o}c up to 72 hours.

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