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## Prepubertal Serum Testosterone Concentration In Vembur Rams At Different Rearing System

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### Abstract

The present investigation was carried out to study the prepubertal testosterone pattern and age at puberty in Vembur rams reared under farm and farmers field condition. A total number of 8 Vembur ram lambs each from farm and farmers field were selected. The measurement of testosterone was performed by Radioimmunoassay (RIA). The serum testosterone level from 6<sup>th</sup> to 20<sup>th</sup> month of age ranged from  $0.132 \pm 0.04$  to  $3.823$  ng/ml in semi intensively maintained farm males and  $0.138 \pm 0.04$  to  $3.456 \pm 0.17$  ng/ml in animals maintained at farmer's holdings. The serum testosterone levels were crossing the concentration of  $2.5$  ng/ml at the age of 17 to 18<sup>th</sup> weeks and successful mounting, intromission and ejaculation were noticed after this age.

**Key Words:** Testosterone, puberty, Vembur sheep, different management, RIA

### Introduction

Testosterone plays a central role in control of spermatogenesis, testicular state, ewe estrous manifestation and sexual behavior in rams. Testosterone, the primary male hormone is responsible for male characteristics. Several findings suggest that blood concentrations of reproductive hormones provide an indication of a ram's reproductive potential. A lot of reports exist about blood plasma testosterone and scrotal circumference with many semen parameters (Moghaddam *et al.*, 2012). However, the correlation between blood plasma testosterone and scrotal circumference with blood testosterone at different rearing system has not hitherto been well studied. Therefore, the aim of this study was to determine relationship between levels of peripheral blood testosterone and rearing system.

### Materials and Methods

A total number of eight Vembur ram lambs each from farm (Instructional Livestock farm Complex, Veterinary College and research Institute, Tirunelveli District, Tamil Nadu) and farmers field (Virudhunagar and Thoothukudi Districts) were selected. Blood samples (5 ml) were collected through intra venous from 6<sup>th</sup> to 20<sup>th</sup> month of age at monthly interval. Serum was harvested and stored at  $-20^{\circ}\text{C}$  till the analysis.

The measurement of testosterone was performed at the Department of Veterinary Physiology and Bio Chemistry, Veterinary College and research Institute, Namakkal, Tamil Nadu by radioimmunoassay (RIA) using the Beckman-Coulter commercial kit. First, serum samples were thawed to room temperature. Subsequently, the tubes were prepared to determine the total count, nonspecific binding, standard curve and controls. The standard curve was prepared to provide a range between 0.025 and 20 ng/ml of testosterone in serum. After preparing standard curve, 50 µl of sample was added to each tube, except the non-specific binding and total count tubes, and 500 µl of testosterone was added to all the tubes. The samples were mixed with a vortex mixer, incubating for three hour at 37°C in water bath. The contents of the tubes were aspirated carefully (except tubes count). Finally, the radioactivity bound to the tubes was measured in a gamma counter for one minute. The sensitivity of the assay was 0.025 ng/ ml, and its intra-assay and inter-assay coefficients of variation were 14.8 per cent and 15 per cent, respectively.

### Results and Discussion

Serum testosterone level from 6<sup>th</sup> to 20<sup>th</sup> month of age are presented in the Fig. 1 and the values ranged from 0.132 ± 0.04 to 3.823 ng/ml in Vembur rams maintained semi intensively in farm condition and 0.138±0.04 to 3.456±0.17 ng/ml in animals maintained at farmer's holdings. During the 16<sup>th</sup> month, significant difference was found in serum Testosterone level (\*P<0.05) between farm and field animals and the values were 2.250 ± 0.10 and 1.758 ± 0.17 ng/ml respectively. The level increases with age advancement ,except in farm animals at 9<sup>th</sup> and 11<sup>th</sup> month of age and 10<sup>th</sup> month of age in farmer's holding. It may be due to difference in rearing system. The level of testosterone was found comparatively low in farmer's holdings except at 8<sup>th</sup> ,9<sup>th</sup> and 10<sup>th</sup> month of age which is non significant and may be due instrumental error.

**Figure 1. Serum Testosterone level (ng/ml) in Vembur males at various age groups at farm and farmer's holding**



Kridli *et al.* (2006) suggested that ram lambs were considered to be pubertal when serum testosterone concentrations crossed 2.5 ng/ml. In the present study the serum testosterone level crossed 2.5 ng/ml at 17<sup>th</sup> months age in farm animals and 18<sup>th</sup> month of age in farmers field.. Illius *et al.* (1976) reported that at birth plasma testosterone level were detectable but low and they were higher at 10 to 16 weeks of age and showed a marked rise by 26 weeks, coincident with the time of puberty. In the present study the serum Testosterone levels were low until 12 month of age (below 500 ng/ml) and a marked raise was noticed after one year of age.

From the farm and field observations it was found that, Vembur rams were sexually active and successfully mated the ewes at the age of 16 to 18 months of age. This indicated that Vembur rams

reach the sexual maturity at 17 to 18<sup>th</sup> months of age and during this period, the serum testosterone level crossed the level of 2.5ng/ml.

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**Conflict of Interest:** All authors declare no conflict of interest.

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