

## Serum transferases during pregnancy and parturition in Madras red sheep

P. VISHA<sup>1</sup>, V. LEELA<sup>2</sup> AND S. VISWANATHAN<sup>3†</sup>

Department of Veterinary Physiology and Biochemistry  
Madras Veterinary College, Chennai - 600 007.

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### ABSTRACT

The aspartate aminotransferase (AST) and alanine aminotransferase enzyme (ALT) levels were estimated from the day of mating to the day of parturition at monthly intervals in madras red sheep. Both enzymes showed an increase upto 3<sup>rd</sup> month and recorded a decrease during 4<sup>th</sup> month and again recorded increase thereafter.

**Key words:** AST, ALT, sheep, pregnancy, parturition

Pregnancy is a period during which the dam adjusts its metabolic profile to suit the needs of the growing foetus. During parturition and after that their needs changes in blood constituents for the formation of colostrum (Hafez, 1993). The increased metabolism is reflected by the changes in the activities of aminotransferases, the enzymes of protein metabolism to catalyse the transfer of amino group to keto acid. Aspartate aminotransferase (AST) and alanine aminotransferase (ALT) are the important enzymes. Madras red sheep is the breed developed at LRS, Kattupakkam by TANUVAS. In the present investigation, estimations of the above enzymes were done in pregnant sheep.

The present study was conducted on six of Madras red sheep stationed at LRS, Kattupakkam. Experimental sheep were allowed eight hours grazing on natural pastures and fed with concentrate mixture (250 gm per day). Drinking water was given ad-libidum. Animals were allowed to mate and blood was collected from animals positive for pregnancy from the day of mating and then at 30 days intervals upto parturition. Serum was separated and used for enzyme assay using commercial kits. The AST and ALT were estimated by the method of Rietman and Frankel (1957). Experimental data was analysed using CRD (Snedocor and Cochran, 1994)

The value of AST and ALT are presented in the table.

<sup>1</sup>Veterinary Assistant Surgeon, Gangavelli, Selam, Tamil Nadu, <sup>2</sup>Associate Professor, <sup>3</sup>Professor & Head (Retd.)

†Corresponding author

### Aspartate amino transferase

The mean activity of AST in serum in non-pregnant sheep was  $30.00 \pm 2.54$  IU/ml. The level showed a non-significant increase to  $32.66 \pm 3.24$  IU/ml on the day of mating. The level showed significant increase from 2<sup>nd</sup> month onwards. At every month there was increase upto 4<sup>th</sup> month. There was a slight decline on 4<sup>th</sup> month and then the level showed a increase during parturition.

The mean values of AST are comparable to the value of Baumgartner and Pernthaner (1994) as in Austrian Karakul sheep. The above authors have recorded similar findings of variations in their study during pregnancy. Okab *et al.* (1993) observed increase in AST in Rahmani and Barki ewes, during mid pregnancy but the values declined during parturition for Barki and Rahmani ewes.

Increased AST activity during pregnancy and parturition was explained by the increase in liver size and metabolism as per West (1989). The overall energy requirement increases during pregnancy and parturition. The metabolic process within the liver will also increase with the concomitant enzyme increase. The rise in plasma AST could also be due the muscle damage and associated mitochondrial damage (Robert *et al.*, 1981).

### Alanine amino transferase

The changes observed in sheep are as follows. The values showed a non-significant rise on the day of mating followed by significant increase up to 3 months of pregnancy and a non-significant increase

Table: Serum transferases levels (IU/ml) during pregnancy and parturition in Madras red sheep

	Non-Pregnant	Day of Mating	Day of Pregnancy				Day of Parturition
			30	60	90	120	
AST	30.00± 2.54 <sup>a</sup>	32.66± 3.24 <sup>a</sup>	39.00± 3.39 <sup>b</sup>	46.16± 3.68 <sup>c</sup>	54.00± 3.16 <sup>d</sup>	51.16± 4.64 <sup>cd</sup>	56.16± 5.85 <sup>d</sup>
ALT	19.83± 2.33 <sup>a</sup>	20.75± 2.27 <sup>a</sup>	25.58± 1.86 <sup>b</sup>	29.50± 2.33 <sup>c</sup>	34.50± 2.33 <sup>c</sup>	33.25± 1.37 <sup>d</sup>	36.41± 2.35 <sup>d</sup>

Superscripts having the same alphabet do not differ significantly.

till the day of parturition. The trend in both enzymes is similar. The value of ALT in the non-pregnant ewes is similar to values reported by Baumgartner and Pernthaoner (1994) for Austrian Karakul sheep. The change in trend of the values of AST is similar as reported by Okab *et al.* (1993).

During early pregnancy, increased activity of ALT reflects the involvement of liver. During later stages of pregnancy and early lactation, the nutrient requirements of foetus and development of mammary gland requires high protein turnover. ALT activities are indicators of mobilization of body reserves when the animal is in negative nitrogen balance (Caldera and Portugal, 1991).

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