

# BLOOD CONSTITUENTS IN MERINO SHEEP IN NORTH-WEST QUEENSLAND

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## *Summary*

A number of blood constituents were determined in samples obtained from 28 Merino sheep every two months from the age of eight weeks to two years.

Mean values for the two years were: haemoglobin 11.7 g/100 ml, red cell count  $10.35 \times 10^6/\text{mm}^3$ , packed cell volume 41.1% , mean corpuscular volume 39.9  $\mu^3$ , total white cell count  $5.78 \times 10^3/\text{mm}^3$ , lymphocytes  $3.17 \times 10^3/\text{mm}^3$ , neutrophils  $2.44 \times 10^3/\text{mm}^3$ , other cells  $0.17 \times 10^3/\text{mm}^3$ , serum albumin 4.2 g/100 ml, serum globulin 2.1 g/100 ml, total serum protein 6.3 g/100 m, serum magnesium 2.5 mg/ 100 ml, serum calcium 11.1 mg/ 100 ml, blood inorganic phosphorus 4.5 mg/ 100 ml, plasma chloride 115 mEqiv./ l., plasma sodium 15 1.5 mEqiv./ l., erythrocyte sodium 85.4 mEqiv./1., plasma potassium 4.7 mEqiv./ 1. and erythrocyte potassium 12.0 mEqiv./ 1.

Changes were found during the experimental period for haemoglobin, red cell count, mean corpuscular volume, total white cell count, lymphocytes, blood inorganic phosphorus, serum globulin and total protein.

## I. INTRODUCTION

There are few reports of the simultaneous determination of the main blood constituents in sheep and no reports in which these determinations were made at frequent intervals in the same animals from birth to two years of age.

In addition, the values available could be of limited use when applied to sheep in North-West Queensland because this involves extrapolation of data obtained in temperate regions to areas where temperatures are high and nutritional stress is severe, and from sheep on improved pastures or hand fed to sheep grazing native pasture. The purpose of this paper is to report interim data on a number of blood constituents of Merino sheep grazing in this environment, from eight weeks to two years of age. Analyses of the effects of age, season and sex and the relationship and repeatability of the determinations will be reported later when the three year study is completed.

## II. MATERIALS AND METHODS

### *(a) Environment*

Blood was obtained from sheep grazing Mitchell grass downs on the Toorak Sheep Field Research Station situated 35 miles S of Julia Creek, Queensland, at latitude of 21 °S. Climatological data are shown in Figure 1 together with the body-weight of the sheep.

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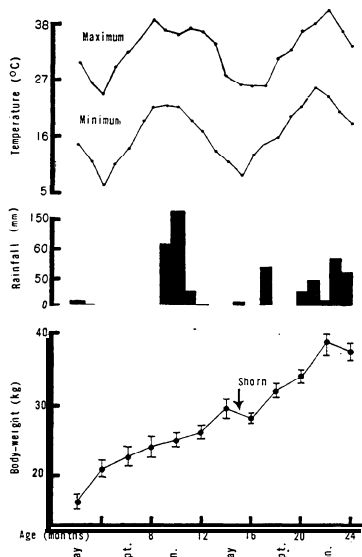


Fig. 1 - Mean body-weight of the grazing Merino sheep with climatological data

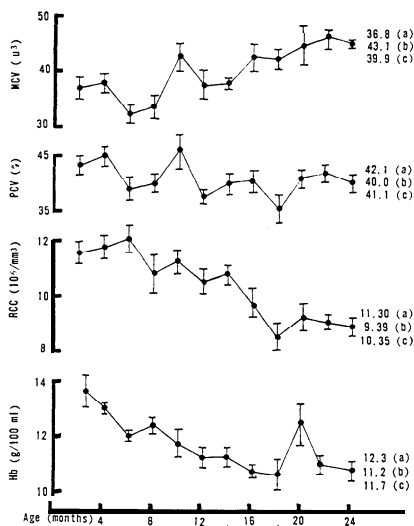


Fig. 2 - Changes with time of mean levels of haemoglobin, red cell count, packed cell volume and mean corpuscular volume

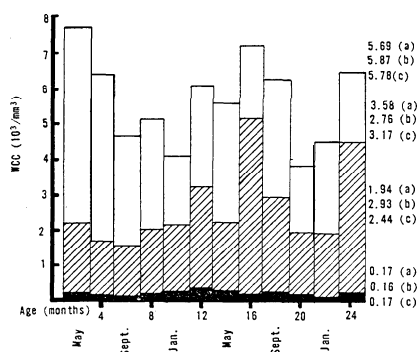


Fig. 3 - Changes with time of total white cell count, lymphocytes , neutrophils and other cells

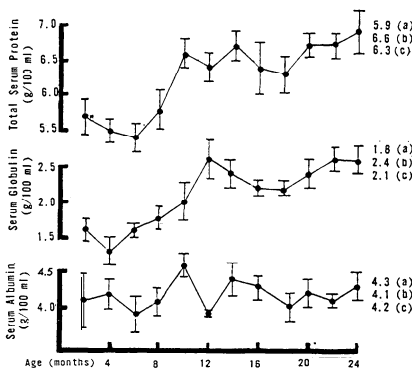


Fig. 4 - Changes with time of mean levels of serum albumin, serum globulin and total serum protein

In all figures, vertical lines show 95% confidence limits for each point, thus:

Mean values are given for sheep in the age ranges of: (a) 2-12 months; (b) 14-24 months; (c) 2-12 months.

On the other hand, values for BIP in sheep are variable. This is mainly due to the relative nutritional status of animals, but is also partly due to methods of sampling and analysis and to diurnal variation in some sheep as pointed-out in an early reference (Watson 1933 a). Our levels were comparable with those from animals grazing in open areas of low rainfall (Beeson *et al.* 1944; March and Swingle 1955) and to some sheep in South Australia (Watson 1933 b) but not to others (Norris and Chamberlin 1929). They were appreciably lower than values found in sheep which were predominantly hand fed (Becker and Smith 1950; Hackett, Gaylor and Bustad 1957; Mehrotra and Mullick 1959; Long *et al.* 1965). The changes in BIP levels with age agree with the findings of Becker and Smith (1950) and Hackett, Gaylor and Bustad (1957).

The concentration of plasma Na was higher than values reported by Clark (1959) and Long *et al.* (1965). Values for plasma K were equivalent to those of Clark (1959), but lower than those of Long *et al.* (1965). Four distinct groups of sheep exist depending on the concentration of Na and K in the erythrocyte and Merino sheep are predominantly  $K\alpha$  (Evans 1957). All our sheep were in this group.

## V. ACKNOWLEDGMENTS

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