"*Normal Values.*—More work has been undertaken in analysing blood-samples from healthy cattle and sheep for the purpose of establishing normal limits. There is no need to modify the values given in last year's annual report (1930–31, page 55), except in the following instances:—

	Sheep.	Cattle.
"Magnesium (serum)	1·5– 2·5	2– 3·5 mgm. per 100 c.c.
"Potassium (serum)	17 –30	20–30 mgm. per 100 c.c.
"Amino acid nitrogen	5 – 8	5– 8 mgm. per 100 c.c.
"Hæmoglobin	10 –15	10–15 grm. per 100 c.c.

"Normal limits for lambs (up to four weeks):—

"Serum calcium	11–13 mgm. per 100 c.c.	Urea nitrogen	10– 15
"Serum inorganic phosphorus	8– 9 mgm. per 100 c.c.	Amino acid nitrogen	8– 10
"Serum magnesium	circa 2 mgm. per 100 c.c.	Lipoidal phosphorus	12– 18
"Serum potassium	20–25 mgm. per 100 c.c.	Cholesterol	100–150
"Sugar	circa 0·100 per cent.	Creatinine	1– 2
"T.N.P.N.	25–35		

"Regular analyses have been made on four ewes and four lambs for a period of twelve months. This work is being continued.

Sugar.—An interesting fact was observed that blood-sugar values obtained from cattle previously stunned at the abattoir prior to slaughtering were always greatly increased and therefore unsuitable for standard values. This increase in blood sugar may be accounted for by the liberation of adrenalin following cerebral injury.

"Biochemical Findings in Diseases.

"*Morton Mains Hogget Mortality.*—Values for blood calcium, inorganic phosphate, potassium, and magnesium lie generally within normal limits. Values for blood sugar and T.N.P.N. are slightly low. The hæmoglobin content has, in most of the samples received been low. Erythrocyte and leucocyte counts are normal. There is a tendency for a relative polymorph increase in the differential leucocyte count.

"*Mairoa Sheep Mortality.*—Blood calcium values in several samples taken from affected animals in untreated paddocks are low, values from 8 mgm. to 8·6 mgm. per 100 c.c. being obtained. norganic phosphorus values have been low (1·9 mgm. to 3 mgm. per 100 c.c.). The low inorganic phosphate values may be partly accounted for by the fact that the erythrocytes, which contain most of the inorganic phosphorus, are usually diminished in numbers. Values for magnesium, potassium, T.N.P.N., and sugar have been normal. The hæmoglobin content is lowered, some values being as low as 6·9 grm. per 100 c.c. In a few cases where leucocyte counts were made there was a slight leucocytosis together with a slight increase in the relative number of polymorphs.

"*Eclampsia (Cattle).*—In serum from 19 cases diagnosed in the field as eclampsia calcium values varied from 5·2 to 9·0, with an average value of 7·3 mgm. per 100 c.c. In several cases the magnesium content was markedly diminished. Values for inorganic phosphate showed moderate fluctuation, but generally were normal. Potassium values were normal.

"*Temporary Sterility.*—Serum-samples from seventy-four heifers showed on analysis little variation from normal limits.

"*Pulpy Kidney.*—In several cases blood analysed for calcium, inorganic phosphorus, magnesium, potassium, T.N.P.N., amino acid nitrogen, and lipoidal phosphorus showed no deviation from the normal.

"*Ante-partum Paralysis (Ewes).*—Analyses of blood from seventeen naturally occurring cases gave the following results:—

	Calcium.	Inorganic Phosphorus.	Sugar. Per Cent.	T.N.P.N.
"Highest	11·2	8·0	0·090	150
"Lowest	7·7	5·3	0·040	29
"Average	9·4	7·4	0·061	61

"Urinalysis was performed on samples from ten naturally occurring cases. All samples showed the presence of albumen. Nine samples gave positive reactions for acetone; six samples gave positive reactions for diacetic acid. pH values varied from 5 to 7·5, averaging 5·5.

"For the purpose of comparison, urines from twelve healthy pregnant farm ewes near the drop were tested with the following results: All samples gave negative tests for albumen, sugar, and diacetic acid; four samples gave positive tests for acetone. pH values varied from 4 to 7, averaging 5·2.

"*Mammitis.*—Samples of milk from normal quarters and samples from affected quarters were examined chemically. At the same time leucocyte counts and cultural examinations were made. The chloride, albumen, and catalase contents were increased, and the lactose and casein contents decreased relatively in proportion to the degree of inflammation as disclosed by the leucocyte count. The calcium content of composite mammitis and composite normal-milk samples from several herds was compared. The calcium content of the mammitis samples was slightly lower than that of the normal samples. Further comparisons of the calcium content are to be made.

"*Soft-clotting Milk.*—The calcium content of soft-clotting-milk samples varied considerably, so that no definite conclusion could be made.

"*Numbers of Specimens Examined.*—Sheep-blood, 297; cattle-blood, 140; fowl-blood, 10; sheep-urine, 10; cattle, 4; milk quantitative analysis, 156; cerebro-spinal fluid, 6; miscellaneous, 40: total, 673."

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