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Summary only

EFFECT OF STARVATION ON BLOOD METABOLITES
IN PREGNANT SHEEP

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Eight non-pregnant, 34 single-pregnant and five twin-pregnant ewes were starved for 10 days in the last month of gestation. They were yarded daily and shorn to induce pregnancy toxæmia. On days 0, 3, 5, 7 and 10 of the starvation period and on days 2, 4 and 7 after the survivors were returned to pasture to recover, jugular blood samples were analysed for plasma glucose, whole blood acetoacetate and 3-OH butyrate, total plasma protein (TPP), plasma creatinine, packed cell volume (PCV), base excess (from blood pH and P_{CO_2}) and serum cations (Na^+ , K^+ , Ca^{++} , and Mg^{++}).

Eight of the single-pregnant and three of the twin-pregnant ewes had dead lambs at birth or autopsy. Nearly all these ewes plus one other single-pregnant and two twin-pregnant ewes displayed clinical signs of toxæmia. Most became moribund and died or were killed for pathological examination.

Only pregnant sheep became hypoglycaemic (glucose ≤ 30 mg/100 ml) and ketonaemic (acetoacetate + 3-OH butyrate ≥ 40 mg/100 ml) during starvation; on refeeding, glucose and ketones returned to normal values. Concentrations of Na^+ and TPP did not change during starvation, but K^+ , Ca^{++} and Mg^{++} fell while PCV increased. When the sheep were turned out to pasture, K^+ , Ca^{++} and Mg^{++} and PCV returned to normal while TPP fell. Seven ewes with dead foetuses had elevated plasma creatinine values (> 3 mg/100 ml). Six of these had a severe metabolic acidosis (base excess -12 to -23 meq/l) and most were also more dehydrated than average (PCV rose 9 to 15 percentage units). On post-mortem examination, these sheep had degenerative lesions of kidney tubules with protein and blood cells in the urine; fatty livers, typical of pregnancy toxæmia, were not prevalent.

The results indicate that a toxic nephrosis with uncorrected metabolic acidosis may be a significant cause of death when pregnant sheep are grossly underfed and stressed in late gestation.

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