

UREA IN PLASMA, AMNIOTIC AND ALLANTOIC FLUIDS OF THE FOETAL LAMB
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Towards the end of pregnancy, the unstressed foetal lamb produces twice as much urea per kg as does the ewe (Faichney and White 1980). Although urea is removed from the foetus through the maternal circulation, the measured clearance of urea from the umbilical circulation via the placenta (Gresham *et al.* 1972) is less than the observed synthesis rate (15.1 of 24.5 mg N/(hr kg)). The difference may be due to diffusion of urea from foetal fluids directly to the maternal circulation.

Urea concentrations have been determined in samples taken from a Merino ewe via catheters established at day 110 of pregnancy in the ewe's pulmonary artery and the foetal dorsal aorta, amniotic and allantoic sacs. The ewe, which weighed 44.5 kg at day 150 and produced a healthy lamb of 4.5 kg at day 153, was given 1 kg/d of a pelleted mixture of lucerne and oats (3:2) continuously from a moving belt. The results (Fig. 1) show a fluid/foetal plasma ratio of 1.88 for amniotic and 1.13 for allantoic fluid but foetal urine, the main source of amniotic and allantoic fluids, is known to contain 3 to 7 times as much urea as does foetal plasma (Robillard *et al.* 1979). ^{14}C -Urea injected into the foetal circulation on day 137 labelled allantoic urea very rapidly, maternal urea less rapidly and amniotic urea less rapidly again (Fig. 2). The results are consistent with the suggestion that the amnion is less permeable than the allantois (Mellor 1970) but show that urea readily enters (Fig. 2) and leaves (Fig. 1) both allantoic and amniotic fluid. Although urea probably returns to the foetal circulation from amniotic and allantoic fluids, the concentration gradient to maternal plasma is greater than to foetal plasma and the close contact between the uterus and both the chorioallantois and the amniochorion provides the opportunity for urea to diffuse directly into the non-placental uterine circulation.

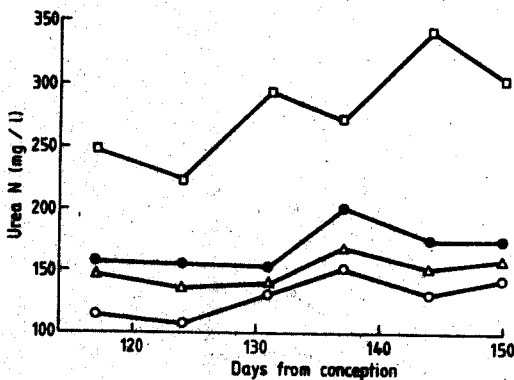


Fig. 1. Urea N concentrations during pregnancy.

○ ewe pulmonary artery;
□ amniotic fluid;

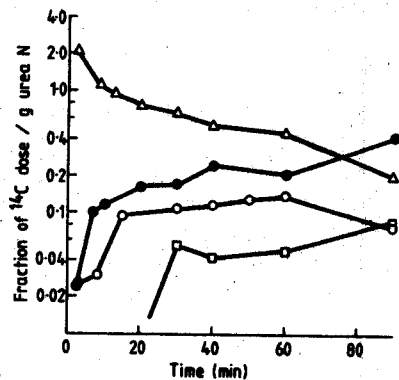


Fig. 2. ^{14}C -Urea specific activities on day 137 of pregnancy.

△ foetal dorsal aorta;
● allantoic fluid.

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