PLASMA PROGESTERONE CONCENTRATIONS DURING PREGNANCY AND PSEUDOPREGNANCY AND ONSET OF OVARIAN ACTIVITY POST PARTUM IN INDIGENOUS GOATS IN ZIMBABWE

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SUMMARY
Eight pregnant does were housed individually and fed a hay and concentrate diet throughout pregnancy and lactation. The mean gestation period was 146.7 ± 3.0 days, with a twinning rate of 75 percent. Mean body condition scores improved from 2.4 ± 0.2 to 2.8 ± 0.2 over the first 80 days of gestation and were maintained at 2.8 until 45 days before kidding. From then until kidding, mean scores fell to 2.2 ± 0.2. Plasma progesterone concentrations during pregnancy rose significantly from 3.91 ± 0.51 ng/ml on day 40 to 5.96 ± 0.51 ng/ml on day 60 (P < 0.05) and remained high until 5 days before kidding. Three pseudopregnant does had similar progesterone profiles to pregnant does over the first 80 days, but the rise around day 35 to 40 was not significant and progesterone concentrations returned gradually to basal levels after day 100.

The same 8 does, together with an additional 4 does which had been brought inside 60 to 70 days before kidding, were used to study onset of ovarian activity post partum. The twinning percentage was 83 percent. Mean body condition score at parturition was 2.2 ± 0.1. By day 35 post partum, mean condition scores had fallen to 1.9 ± 0.1, and mean weights from 36.9 ± 1.9 kg at kidding to 32.1 ± 2.0 kg. Ovarian cyclicity was resumed just before mean scores and weights started to improve. The mean interval from kidding to onset of oestrous cycles was 97.3 ± 9.5 days. This coincided with mean time to weaning which was 99.5 ± 5.5 days. It is suggested that suckling and body condition regulate the length of post-partum anoestrus in this species. Season may also play a regulatory role, since does kidding in April to June (n = 6) were anoestrous for 82.7 ± 15.0 days compared to 112 ± 7.3 days for does kidding in October to February (n = 6), although the difference was not significant.

INTRODUCTION
There are approximately 1.8 million goats in Zimbabwe which are kept by subsistence farmers in the communal areas. Despite the belief that these goats are prolific breeders, productivity is generally low. Some of the reasons for this are high kid mortality rates and prolonged kidding intervals (Hale, 1986). In one study, a mean value of 370 days was recorded and plasma progesterone profiles indicated that this was due to prolonged post-partum anoestrus (Ndlovu and Llewelyn, unpub. data), with most does remaining acyclical for over 150 days. It was thought that nutritional constraints were responsible for delaying the onset of post-partum activity in these goats, resulting in prolonged kidding intervals. The present study was designed to investigate progesterone profiles during pregnancy and to investigate onset of ovarian activity post partum in indigenous goats in Zimbabwe.

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activity in a group of goats receiving concentrate supplementation during pregnancy and lactation.

MATERIALS AND METHODS

Eleven does from the University goat herd were housed in single pens and fed a diet of veld hay *ad libitum* supplemented with a ration based on maize meal and cotton seed hulls (Table I). Eight does were studied throughout pregnancy and 3 throughout a pseudopregnancy. To increase the numbers of does available for studying the interval from kidding to onset of ovarian activity from 8 to 12, another 4 pregnant does of comparable body condition were fed concentrate supplement for the last 60 to 70 days of pregnancy. All does received 0.25 kg/day of the concentrate ration, which was increased after parturition to 0.5 kg and to 1 kg/day for body condition scores of <1.5. The goats were weighed weekly and scored 3 times a week to assess body condition using the method of Honhold *et al.* (1989). Mean interval from parturition to weaning was 99.5 ± 5.5 days (range 69 to 114).

Goats were bled 3 times a week throughout the study. Blood was collected into tubes containing EDTA as anti-coagulant and kept on ice before centrifugation at 2,500 g for 30 minutes. Plasma was stored at −20°C to await radioimmunoassay (RIA).

Progesterone concentrations were measured in 50 μl plasma by a direct double-antibody RIA according to the method of Corrie *et al.* (1981) with 2.5 pg of 125I-iodinated progesterone-11α-glucuronide-tyramine (Amersham International) as tracer and 500 ng/tube of danazol (Winthrop Sterling) to displace progesterone bound to plasma proteins. The first antiserum (R104/10) was raised in a rabbit against progesterone-11α-hemisuccinate conjugated to bovine serum albumin and used at a titre of 1/4000. Cross reactions were as follows: 11α-hydroxyprogesterone 15.9%, corticosterone 4.6%, deoxycorticosterone 3.1%, 5α-pregnanedione 1.6%, 11-dehydrocorticoesterone 1.2%, 17α-hydroxyprogesterone 0.6%, pregnenolone and oestrone < 0.1%. Cortisol, cortisone, androstenedione and testosterone were < 0.01% and oestradiol and oestradiol < 0.001 per cent. The second antiserum was donkey anti-rabbit serum used with normal rabbit serum as carrier. The minimal detectable dose was 0.4 ng/ml and the intra-assay coefficient of variation was 14.1% and 10.7% for medium (2.4 ng/ml) and high (4.8 ng/ml) quality control pools respectively.