Effect of pregnancy and litter size on steroid hormones and energetic metabolites profiles of Ouled Djellal ewes raised under arid and semi-arid climates of Algeria

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Résumé

Patterns of secretion of progesterone (P4), estradiol 17-β (E2) and energy-related metabolites profiles were investigated during the spring breeding season in non-pregnant and pregnant Ouled Djellal ewes bearing singleton or twin foetuses in arid and semi-arid climates of Algeria. Twenty and thirty ewes aged 1 to 4 years from semi-arid and arid zones, respectively, were used. In semi-arid zone, 15 ewes were pregnant (8 carrying one fetus and 7 carrying twin). In arid zone, from 24 pregnant ewes, 14 carried singleton and 10 carried twins. Blood samples were collected before mating, in early pregnancy (first month), in late pregnancy (last month), and after lambing (20-30 days post-partum). Serum P4 and E2 levels were determined using chemiluminescence immunoassay and energetic metabolites using enzymatic colorimetric assays. The serum P4 and E2 concentrations showed an increasing trend with the advance of gestation and increased litter size in both regions with highest levels in arid zone. Significant effect ($p < 0.05$) of litter size was found during early gestation on serum P4 in arid region and on serum E2 ($p < 0.05$) in both regions. During late pregnancy significant effect of fetal number was observed in semi-arid ($p < 0.05$) and arid ($p < 0.001$) area for P4 and only in arid zone ($p < 0.05$) for E2. In the present study, no significant effect of litter size was found on serum glucose, cholesterol and triglycerides in both regions. Ewes in arid zone have lower glucose concentrations and higher levels of cholesterol and triglycerides in all sampling periods. There was a highly significant negative ($r = -0.481$, $p < 0.001$) correlation between triglycerides and glucose in arid zone. Reproductive hormones profiles and energetic metabolism in pregnant OD ewes raised in arid zone are more altered than those in semi-arid one.

Key words: Arid, energetic metabolites, Estradiol 17-β, Progesterone, semi-arid.