**Supplementary data:**

**Supplementary Table S1: Effects of sex of sheep on different parameters**

|  |  |  |  |
| --- | --- | --- | --- |
|  |  | SEM | *P* value |
| Wether | Ewe | *Sex* | diet×env×sex |  |
| Plasma glucose concentration (mg/dL)Plasma glucose turnover rate (mg/kg0.75/min)Plasma glucose utilization rate (mg/kg0.75/min)Response of glucose metabolism to insulin (mg/kg0.75/min)Heart rate (beats/min)Rectal Temperature (oC)Respiration rate (breaths/min)Plasma concentration of -tocopherol (g/L)Plasma NEFABody weight changePlasma retinolDry matter intake | 49.237.655.56-1.8268.9239.2055.692.530.245-1.590.360.826 | 49.297.275.36-1.7265.5439.4748.192.710.251-1.550.350.818 | 0.990.140.140.090.790.084.380.180.050.270.010.04 | 0.980.350.470.540.070.180.320.630.160.490.550.21 | 0.640.300.850.300.420.430.880.610.440.520.600.15 |