

12th International Congress of Endocrinology

Lisbon, August 31 - September 4, 2004

Poster Presentation - Series B - Development

P756 - Mcl-1 and bax in the fetal ovary: studies of the undernourished pregnant ewe.

Andrade L.¹, Miller D.², Rae M.³, Rhind S.⁴, Hannah L.⁵, Kyle C.⁴, Lea R.⁵

¹Escola Superior Agrária Castelo Branco, UD Zootecnia, Castelo Branco, ²University of Aberdeen, School of Biological Sciences, Aberdeen, ³University of Edinburgh, Obstetrics and Gynaecology, Edinburgh, ⁴Macaulay Institute, Aberdeen, ⁵Rowett Research Institute, Aberdeen

Background of Study: In the sheep, maternal undernutrition during the first part of gestation (0 to 110 days) delays follicle development in the fetal ovary without affecting total follicular number (Rae et al., *Reprod.* 122:915, 2001).

Objectives: To determine the role of apoptosis regulatory genes (mcl-1: anti-apoptosis, bax: pro-apoptosis) in delayed follicle development

Methods: Adult pregnant ewes were fed 50% or 100% (Control) of their nutritional requirements from days 0–30, 31–50 or 65, 65–110 or 0–110 (n=8 per group). Control and underfed ewes were slaughtered at days 50, 65 or 110 of gestation. Bouin's fixed fetal ovaries were examined for mcl-1 and bax mRNA and protein by in-situ hybridisation and immunohistochemistry.

Results: At days 50 and 65, mcl-1 and bax staining was predominant in the oocytes and undernutrition had no effect. At day 110, mcl-1 was predominant in the oocyte, bax in the granulosa cells and both genes were present in the vasculature. Animals underfed from day 0 to 110, had significantly increased mcl-1 (P<0.05) and bax (P<0.05) in the primordial follicles and endothelial cells (P<0.05). Follicular Mcl-1 and bax were also increased when nutritional restriction was limited to days 31–65 (mcl-1 & bax: P<0.05) or 65–110 (mcl-1 & bax: P<0.05) but not 0–30 days.

Conclusions: Undernutrition during mid-gestation increased fetal ovarian mcl-1 and bax in the follicle and vasculature. These changes may have a causal role in the delayed follicular development which characterises maternal undernutrition or may be downstream from these processes.