

## **Fatty Acid Profile of Oocytes and Blastocysts during *In Vitro* Bovine Embryo Production**

**M Lapa, CC Marques, MC Baptista, MI Vasques, AEM Horta,  
PV Portugal, RJB Bessa and RM Pereira**

*Estação Zootécnica Nacional – INIAP, Vale de Santarém, Portugal*

Lipid content in oocytes and embryos plays important roles both in energy metabolism during oocyte maturation, fertilization and early development, and in their cryopreservation. However the composition and function of lipids during *in vitro* embryo production is not well known. Fatty acid (FA) profiles in immature (IM) and mature (MAT) oocytes (3 samples each; 100 to 142 per sample) and blastocysts (BL: 4 samples; 15 to 20 per sample) were investigated. Abattoir-derived oocytes were matured (TCM199 + 10% serum + 10  $\mu\text{g mL}^{-1}$  FSH) and fertilized *in vitro* (IVF = D0). Presumptive zygotes were cultured (39°C, 5% CO<sub>2</sub>; TCM199 + 10% serum and granulosa cell monolayers) to the BL stage (12 sessions). Thawed samples were homogenized in chloroform:methanol (2:1, v:v). Fatty acid composition of total extracted lipids was determined by gas chromatography. Data were analyzed using ANOVA and LSD. Maturation, cleavage and D8 embryo rates were  $88.4 \pm 1.5$ ,  $72.7 \pm 2.9$  and  $27.1 \pm 2.6\%$  (mean  $\pm$  SEM) respectively. From the total FA content of IM, MAT and BL  $68.1 \pm 1.5$ ,  $64.2 \pm 1.2$  and  $72.0 \pm 1.5\%$  were saturated (MAT vs. BL  $p < 0.01$ ),  $18.7 \pm 3.7$ ,  $23.6 \pm 1.4$ ,  $14.7 \pm 1.9\%$  monounsaturated and  $13.3 \pm 2.5$ ,  $12.3 \pm 0.2$ ,  $13.3 \pm 1.0\%$  polyunsaturated FA, respectively. Fatty acid profiles did not differ significantly between oocytes or embryos being the palmitic, stearic and oleic acids the most abundant. Preferential accumulation of saturated FA in BL could explain the high susceptibility of embryos cultured with serum to cryopreservation.