



165 *In vitro* maturation of ovine and caprine oocytes during breeding and nonbreeding seasons

M. Markle^A, C. K. Mak^A, V. Medina^A and C. R. F. Pinto^A

+ Author Affiliations

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Abstract

The current study investigated the *in vitro* meiotic competence of ovine and caprine oocytes that underwent nuclear maturation during the breeding and nonbreeding seasons. We hypothesised that maturation rates of ovine and caprine oocyte would be significantly lower during the nonbreeding season. Ovine (Katahdin crossbred) and caprine (mainly Spanish crossbred) ovaries were collected from a local abattoir in the southern United States. Age of the animals was not determined. Cumulus-oocyte complexes (COC) were harvested by slicing the ovaries and searching using a stereomicroscope. Oocytes with more than 3 layers of unexpanded cumulus cells and with evenly granulated cytoplasm were selected for *in vitro* maturation (IVM). A commercial bovine IVM media (IVF Bioscience, Falmouth, United Kingdom) was used throughout the study. After 24 h of IVM, ovine and caprine oocytes were denuded and oocytes with an extruded polar body (meiotic metaphase II oocytes) were considered to have reached nuclear maturation. The seasons in this study were defined as follows: breeding season = September to April and nonbreeding season = May to July. The presence of corpus hemorrhagicum or corpus luteum in at least 70% of the ovaries indicated the breeding season for the animals. Proportions of oocytes undergoing nuclear maturation were analysed using a two-tailed Chi-squared test. Statistical significance was set at $P \leq 0.05$. The ovine maturation rate was 59% (65/111) and 49% (254/519) and the caprine maturation rate was 70% (39/56) and 40% (64/162) during the breeding and nonbreeding seasons, respectively. These results show a significant difference in nuclear maturation for caprine oocytes ($P < 0.001$) during the breeding and nonbreeding seasons; however, there was no significant difference in nuclear maturation for ovine oocytes ($P = 0.06$) during the breeding and nonbreeding seasons. High environmental temperatures during the nonbreeding season may have had detrimental effects on oocyte nuclear maturation in caprine but not in ovine oocytes. Why oocytes from these 2 species differ on how they are adversely affected by season remains to be elucidated.