Animal Reproduction

Abstracts - 35th Annual Meeting of the Brazilian Embryo Technology Society (SBTE)

OPU-IVF and ET

# Oocyte maturation with bisphenol A (BPA) induces oxidative stress and impairs bovine embryo production

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## Resumo

Bisphenol A (BPA), a monomer widely used in the plastic industry, is associated with serious effects on reproduction due to its binding to estrogen receptors (ERs). BPA was detected in human urine, saliva, blood, amniotic and follicular fluid. Animal studies have shown that BPA causes meiotic abnormalities, decreases percentage of oocytes that progress to metaphase II and increases oocytes degeneration. Here we aimed to investigate the effects of BPA during oocyte *in vitro* maturation on oxidative stress and the subsequent impact on early *in vitro* embryo development in cattle. For this, five replicates containing 20 cumulus-oocyte complexes (COCs) each were *in vitro*-matured with 1000 µM of BPA (0.1%DMSO) and subsequently submitted to analysis of oxidative stress using CellROX™ Green®, mitochondrial membrane potential using MitoTracker® Red, meiosis progression by Hoechst 33342's analysis; and embryo yield. The control group were *in vitro* matured with basal medium (0.1%DMSO). The effect of 1000 µM BPA was tested by unpaired T-test. Differences were considered significant when $P < 0.05$. We observed that oocytes treated with 1000 µM BPA exhibited toxicity and cell damage due to the high levels of reactive oxygen species and high levels of mitochondrial membrane potential. Also, no oocyte reached to metaphase II. Thereafter, BPA treatment blocked fertilization and embryo development. In general, we concluded that addition of 1000 µM of BPA during oocyte *in vitro* maturation blocks meiotic resumption and increases oxidative stress in bovine oocytes, which leads to impaired *in vitro* development of bovine embryos.

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## Acknowledgements

National Council for Scientific and Technological – CNPq (grant 140620/2020-6) e Fundação de Amparo à Pesquisa do Estado de São Paulo (grant 2020/08747-1).