

Changes in gene expression profiles of bovine embryos produced *in vitro*, by natural ovulation, or hormonal superstimulation

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ABSTRACT. Embryos produced by hormonal superstimulation have been used as an *in vivo* control in most published research on embryo gene expression. However, it is not known if this is the most appropriate control for gene expression profile studies. We compared the expression of *GRB-10*, *IGF-II*, *IGF-IIR*, *MnSOD*, *GPX-4*, *catalase*, *BAX*, and *interferon- τ* genes, in embryos produced *in vivo* by hormonal superovulation (SOV), by *in vitro* fertilization (IVF) or *in vivo* without any hormonal stimulus (NOV). *GRB-10* was less expressed in NOV than IVF embryos, whereas no differences were found for the other genes. The genes related to stress response were then grouped and compared; the sum of expression of *MnSOD*, *GPX-4*, and *catalase* genes tended to be greater in IVF than NOV embryos. A correlation analysis was performed; we found a distinct behavior for NOV embryos when compared with SOV and IVF in the expression of *GRB-10*, *IGF-II*

and *IGF-IIR* genes. However, the behavior of these genes was similar in SOV and IVF embryos. We conclude that ovarian hormonal stimulation can affect embryos by altering gene expression. Although this conclusion was based on investigation of only a few genes, we suggest that SOV embryos should be used with caution as a control in gene expression studies.

Key words: Cattle; Assisted reproduction technologies;
Animal reproduction