257 DIFFERENCES BETWEEN *BOS TAURUS* AND *BOS INDICUS* EMBRYOS: TRANSCRIPTS AMOUNTS

S. Wohlres-Viana [A], M. M. Pereira [A], A. P. Oliveira [B], J. H. M. Viana [C], M. A. Machado [A] and L. S. A. Camargo [C]

[A] Universidade Federal de Juiz de Fora, Juiz de Fora, Minas Gerais, Brazil;
[B] Epamig, Juiz de Fora, Minas Gerais, Brazil;
[C] Embrapa Gado de Leite, Juiz de Fora, Minas Gerais, Brazil

Abstract

The Zebu breeds (*Bos indicus*) are different from European breeds (*Bos taurus*) in some aspects of their reproductive physiology, including follicle recruitment, number of follicular waves, and oocyte ultrastructure. On the other hand, embryos produced *in vivo* and *in vitro* show morphological and developmental differences, which can be related to culture environment. The aim of this study was to evaluate the effect of breed (Gyr *v.* Holstein) within embryo production system (*in vivo* and *in vitro*), as well as effect of production systems within breeds on relative abundance of transcripts related to formation, survival, and subsequent development of blastocysts, such as those involved in water and small solutes transport (Aquaporins 3 and 11), blastocoel formation (Na+/K+-ATPase a1 and |52), and cellular stress response (Peroxiredoxin 1). For *in vivo* embryo production, donors were superstimulated with FSH and inseminated, and embryos were recovered 7 days after AI. For *in vitro* embryo production, oocytes recovered by ovum pickup were *in vitro* matured and fertilized and then cultured for 7 days in culture medium under 5% CO_2 at 38.5°C. For each group, blastocysts (n = 15) distributed in 3 pools were used for RNA extraction (RNeasy MicroKit, Qiagen, lencia, CA, USA), followed by RNA amplification (Messageamp II amplification kit, Ambion-Applied Biosystems, Foster City, CA, SA) and reverse transcription (SuperScript III First-Stand Synthesis Supermix, Invitrogen, Carlsbad, CA, USA). The cDNA were submitted to real-time PCR, using the H2a gene as endogenous control, and analyzed by REST© software. To evaluate breed effect within the production systems, 2 comparisons were performed: (1) *in vivo*: Gyr *v.* Holstein and (2) *in vitro*: Gyr *v.* Holstein, considering Holstein data as 1.00. To evaluate production system effect within breeds, 2 comparisons were performed: (1) Gyr: *in vivo v. in vitro* and (2) Holstein: *in vivo v. in vitro*, considering *in vivo* produced embryo data as 1.00. The results are shown as mean ± SEM. For *in vivo* comparison between breeds, Aquaporin 3 (1.66 ± 0.77), Na+/K+-ATPase a1 (1.61 ± 0.56), and Peroxiredoxin 1 (1.61 ± 0.66) were up-regulated ($P < 0.05$) in Gyr embryos when compared with Holstein embryos, whereas for *in vitro* comparison, no differences ($P > 0.05$) were found. For comparisons between production systems within breeds, only Peroxiredoxin 1 (0.31 ± 0.39) was down-regulated ($P < 0.01$) in *in vitro* produced Gyr embryos when compared with *in vivo* counterparts. No differences ($P > 0.05$) were found between production systems for the Holstein breed. In conclusion, these data suggest that there is a difference on gene expression between *Bos taurus* and *Bos indicus* blastocysts, but such difference between breeds can be attenuated by the *in vitro* production system, indicating an embryo adaptation to the *in vitro* culture conditions. The data also suggest that the *in vitro* production system can influence the amount of transcripts in Gyr embryos. Other genes should be evaluated for a better understanding of these differences.

Financial support was provided by CNPq and FAPEMIG.

Reproduction, Fertility and Development 22(1) 285–286 doi:10.1071/RDv22n1Ab257
Published: 08 December 2009

Reproduction, Fertility and Development

An international journal at the forefront of reproduction and developmental science

Search

This Journal GO
Advanced Search

- Journal Home
  General Information
  Scope
  Editorial Board
  Editorial Contacts
  Print Publication Dates
- Online Content
- For Authors
- For Referees
- How to Order

Most Read

Visit our Most Read page regularly to keep up-to-date with the most downloaded papers in this journal.

Early Alert

Subscribe to our email Early Alert or feeds for the latest journal papers.

Table of Contents

Reproduction, Fertility and Development
Volume 22 Number 1 2010
Proceedings of the Annual Conference of the International Embryo Transfer Society, Córdoba, Argentina, 9–12 January 2010
Full Papers and Abstracts for Poster Presentation