



ANIMAL REPRODUCTION

Official journal of the Brazilian College of Animal Reproduction

v.15, n.3

July/September

2018

Contents

Proceedings of the 32nd Annual Meeting of the Brazilian Embryo Technology Society (SBTE); Florianópolis, SC, Brazil, August 16th to 18th, 2018, and 34th Annual Meeting of the European Embryo Transfer Association (AETE); Nantes, France, September 7th and 8th, 2018

| | |
|-------------------------|-----|
| From the SBTE President | 164 |
|-------------------------|-----|

| | |
|-------------------------|-----|
| From the AETE President | 165 |
|-------------------------|-----|

| | |
|-------------------------------------|-----|
| From the Scientific Committee Chair | 166 |
|-------------------------------------|-----|

Conferences papers

| | |
|---|-----|
| The transformational impact of site-specific DNA modifiers on biomedicine and agriculture K. Polkoff, J.A. Piedrahita | 171 |
|---|-----|

| | |
|---|-----|
| The local regulation of folliculogenesis by members of the transforming growth factor superfamily and its relevance for advanced breeding programmes J.L. Juengel, P.R. Smith, L.D. Quirke, M.C. French, S.J. Edwards | 180 |
|---|-----|

| | |
|--|-----|
| Laparoscopic ovum pick-up for in vitro embryo production from dairy bovine and buffalo calves H. Baldassarre, V. Bordignon | 191 |
|--|-----|

| | |
|---|-----|
| Intensified use of TAI and sexed semen on commercial farms M.O. Marques, F. Morotti, E. Lorenzetti, C. Bizarro-Silva, M.M. Seneda | 197 |
|---|-----|

| | |
|---|-----|
| Epigenetic remodeling in preimplantation embryos: cows are not big mice P.J. Ross, R.V. Sampaio | 204 |
|---|-----|

| | |
|--|-----|
| History, Origin, and Function of Transzonal Projections: The Bridges of Communication Between the Oocyte and its Environment H.J. Clarke | 215 |
|--|-----|

| | |
|--|-----|
| Expression of estrus as a relevant factor in fixed-time embryo transfer programs using estradiol/progesterone-based protocols in cattle G.A. Bó, A. Cedeño | 224 |
|--|-----|

| | |
|--|-----|
| Oocyte mitochondria: role on fertility and disease transmission M.R. Chiaratti, B.M. Garcia, K.F. Carvalho, C.H. Macabelli, F.K.S. Ribeiro, A.F. Zangirolamo, F.D. Sarapião, M.M. Seneda, F.V. Meirelles, F.E.G. Guimarães, T.S. Machado | 231 |
|--|-----|

| | |
|---|-----|
| Use of Doppler ultrasonography in embryo transfer programs: feasibility and field results G. Pugliesi, G.D. Melo, G.A. Ataíde Jr, C.A.G. Pellegrino, J.B. Silva, C.C. Rocha, I.G. Motta, J.L.M. Vasconcelos, M. Binelli | 239 |
|---|-----|

| | |
|---|-----|
| Genetic market in cattle (Bull, AI, FTAI, MOET and IVP): financial payback based on reproductive efficiency in beef and dairy herds in Brazil P.S. Baruselli, A.H. Souza, M.F. Sá Filho, J.N.S. Sales | 247 |
|---|-----|



| | |
|---|-----|
| Strategies for increasing fertility in high productivity dairy herds L. Bragança, A.F. Zangirolamo | 256 |
| Contributions from the ovarian follicular environment to oocyte function M. del Collado, G.M. Andrade, F.V. Meirelles, J.C. Silveira, F. Percin | 261 |
| Oocyte related factors impacting on embryo quality: relevance for <i>in vitro</i> embryo production F. Nuttinck | 271 |
| From clinics to (cow)mics; a reproductive journey P. Humblot | 277 |
| Directions and applications of CRISPR technology in livestock research I. Lamas-Toranzo, P. Ramos-Ibeas, E. Pericuesta, P. Bermejo-Álvarez | 292 |
| Preservation of female fertility in humans and animal species H.M. Picton | 301 |
| Ovarian antral follicle populations and embryo production in cattle A.F. Zangirolamo, F. Morotti, N.C. Silva, T.K. Sanches, M.M. Seneda | 310 |

Conference abstracts

32nd Annual Meeting of the Brazilian Embryo Technology Society (SBTE)

| | |
|--|---------|
| TAI/FTET/AI (Abstracts A001 to A077) | 316-392 |
| OPU-IVF and ET (Abstracts A080 to A124) | 393-437 |
| Folliculogenesis, Oogenesis and Superovulation (Abstracts A138 to A158) | 438-458 |
| Physiology of Reproduction in Male and Semen Technology (Abstracts A160 to A172) | 459-471 |
| Embryology, Developmental Biology and Physiology of Reproduction (Abstracts A182 to A216) | 472-506 |
| Cloning, Transgenesis and Stem Cells (Abstracts A241 to A255) | 507-521 |
| Support Biotechnologies: Cryopreservation and cryobiology, diagnosis through imaging, molecular biology and “omics” (Abstracts A260 to A275) | 522-537 |

34rd Meeting of the Association of Embryo Transfer in Europe (AETE)

| | |
|--|---------|
| TAI/FTET/AI (Abstracts A078E to A079E) | 538-539 |
| OPU-IVF and ET (Abstracts A125E to A137E) | 540-552 |
| Folliculogenesis, Oogenesis and Superovulation (Abstracts A159E to A159E) | 553 |
| Physiology of Reproduction in Male and Semen Technology (Abstracts A173E to A181E) | 554-562 |
| Embryology, Developmental Biology and Physiology of Reproduction (Abstracts A217E to A240E) | 563-586 |
| Cloning, Transgenesis and Stem Cells (Abstracts A256E to A259E) | 587-590 |
| Support Biotechnologies: Cryopreservation and cryobiology, diagnosis through imaging, molecular biology and “omics” (Abstracts A276E to A288E) | 591-603 |
| Workshop I: Sanitary and regulations on embryo transfer | 604-607 |
| Workshop II: Preservation of IVP embryos | 608-610 |

| | |
|---------------------------------|-----|
| Author index to v.15, n.3, 2018 | 611 |
|---------------------------------|-----|



A115 OPU-IVP and ET

Embryos production from bovine oocytes matured *in vivo* using intrafollicular transfer of immature oocytes (TIFOI)

L.R.O. Dias¹, V.A.O. Silva², O.A.C. Faria¹, F.M.C. Caixeta¹, J.F.W. Sprícigo³, M.A.N. Dode⁴

¹UnB - Universidade de Brasília, Brasília, DF, Brasil; ²ICESP - Faculdades Icesp, Brasília, DF, Brasil; ³University of Guelph - Department of Animal Bioscience, Guelph, ON, Canadá; ⁴Embrapa Recursos Genéticos e Biotecnologia, Brasília, DF, Brasil.

Intrafollicular transfer of immature oocytes (TIFOI) provides an entirely *in vivo* environmental condition and may be a good alternative to produce embryos in cattle. However, several aspects of the technique have yet to be established. The aim of this study was to evaluate if the time in which the oocytes remain in the follicle after the TIFOI is enough to allow the oocytes a complete maturation, fertilization and embryo development. Ovulator cows were submitted to a standard estrus synchronization protocol, using a vaginal progesterone device, estradiol benzoate and prostaglandin. On D8, the progesterone device was removed and 52 hours later animals with had a dominant follicles greater than 10 mm was subjected to TIFOI. A total of 1297 immature oocytes were obtained from slaughterhouse ovaries, in which 609 were used for TIFOI and the remainder was used as control. In the control group, the oocytes were placed in IVM and IVF was performed at 12, 16 and 22h of culture. For TIFOI 30 to 50 oocytes were transferred to ovulator cow, which at 12 h post-injection were recovered by ovum pick up (OPU). The recovered oocytes were divided into three groups: one was submitted to IVF immediately after aspiration (12h after TIFOI), and the remaining oocytes were placed in IVM for another 4 and 10 hours prior to IVF (16 and 22h after TIFOI). Oocytes and sperm were co-incubated for 12 h and the possible zygotes were transferred to culture drops, where they remained until day 7 (D7). Treatments and number of oocytes per treatment were: control 12h (n=223); control 16h (n=229); control 22h (n=236); TIFOI 12h (n=239); TIFOI 4h (n=185); TIFOI 22h (n=185). The cleavage (D2) rate, blastocyst rates (D6 and D7) and apoptotic index in D7 embryos (Terminal deoxynucleotidyl transferase dUTP nick end labeling [TUNEL]) were evaluated. The cleavage and blastocyst rate data were analyzed by Chi-square test ($P < 0.05$). The total number of cells, apoptotic index and ratio between the two were analyzed by ANOVA and Tukey's test ($P < 0.05$). The blastocysts rate on D7 was similar ($P > 0.05$) among the control groups (control 12h=35.4%, control 16h=36.7% and control 22h=40.7%), as well as among TIFOI groups (TIFOI 12h=18.8%, TIFOI 16h=17.3% and TIFOI 22h=21.6%). The blastocysts rate on D7 was higher ($P < 0.05$) in the control groups than in the TIFOI groups. Regarding the total cells number, there was no difference ($P > 0.05$) among all groups. The percentage of apoptotic cells in the TIFOI 22h group (4.1%) differed ($P < 0.05$) only from the control 12h (7.2%) and control 16h (7.1%) and did not differ from the others ($P > 0.05$) (control 22h=6.3%, TIFOI 12h=5.1%, TIFOI 16h=6.3%). Despite the lower embryonic development, observed in the TIFOI group, it can be concluded that the time of 12 hours is sufficient for the oocytes to be ready to be fertilized and to develop to blastocyst stage. It seems that the time after the injection to fertilization is not the main obstacle for the embryonic development.