

## SENSITIVITY OF BOVINE MORULAE AND BLASTOCYSTS TO HEAT SHOCK *IN VITRO*

*V. Naik<sup>1</sup>, N. N. Jonsson<sup>1</sup>, N. J. Phillips<sup>1</sup>, P. Kaye<sup>2</sup>*

<sup>1</sup>School of Veterinary Science, University of Queensland, St Lucia, QLD, Australia; <sup>2</sup>School of Biomedical Science, University of Queensland, St Lucia, QLD, Australia

Thermotolerance of blastocysts and morulae is greater than that of zygotes. However, lower rates of pregnancy have been recorded when morulae rather than blastocysts were transferred. The aim of this study was to determine if morulae displayed lower thermotolerance than blastocysts *in vitro*. Embryos were produced from oocytes collected from abattoir-sourced ovaries. On Day 7 post fertilisation, embryos were classified as morulae or blastocysts and subjected to either an increase in temperature from 39°C to 41.5°C over 1 h followed by a decrease to 39°C over 2 h (HS) or maintained at 39°C (NHS), using a water jacketed CO<sub>2</sub> incubator. The number of embryos progressing to expanded and hatched blastocysts was recorded after 48 h further culture at 39°C. After arcsine transformation, the proportions progressing were submitted to a general linear model using adjusted sum of squares for tests of difference. Factors were embryonic stage, treatment and sire and the interaction terms of stage and sire with treatment. The Kruskal-Wallis test was also applied to the untransformed, non-parametric data set. Non-parametric, univariate analysis indicated non-significant effects of treatment (NHS median proportion progressing = 72 %, HS = 64 %,  $P = 0.12$ ) and of sire (NHS = 78 %, HS = 64 %,  $P = 0.168$ ), while the effect of stage was highly significant (morulae = 35%, blastocysts = 79%,  $P = 0.0000$ ). However, according to the general linear model, treatment and stage were significant factors ( $F = 5.39$  and  $38.3$ , respectively, and  $P = 0.032$  and  $0.000$ , respectively) and sire approached significance ( $F = 4.09$ ,  $P = 0.058$ ). Neither of the interaction terms was significant. It was concluded that embryos, which were morulae on Day 7, were less likely to progress to expanded or hatched blastocysts and that heat shock reduced developmental progression.