

Changes in expression of *CWC15* during preimplantation development in the bovine embryo

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Recently, a nonsense mutation in *CWC15* was identified as a likely causative mutation affecting fertility in Jersey cattle. Although the carrier frequency in the population is relatively high (23.4%), no homozygous animals have been identified, leading to the conclusion that this mutation is associated with embryonic or fetal loss. *CWC15* encodes for a protein associated with the spliceosome, but little is known about its role in splicing of pre-mRNAs. The purpose of this experiment was to determine whether *CWC15* is expressed in the preimplantation embryo. If so, it is possible that inheritance of the nonsense mutation could lead to early embryonic death. Embryos were produced *in vitro* from slaughterhouse oocytes and bulls from *Bos taurus* and *B. indicus* breeds. For each of the four replicates, pools of 30 matured oocytes or 30 embryos at the 2 cell [28-32 h post insemination (hpi)], 3-4 cell (48 hpi), 5-8 cell (57-60 hpi), 9-16 cell (72 hpi), morula (120 hpi) and blastocyst (168 hpi) stages were collected. The RNA was purified and subjected to real-time PCR analysis. The expression of *CWC15* was measured with the delta delta Ct method and *YWHAZ*, *GAPDH* and *SDHA* were used as housekeeping genes. Amounts of mRNA for *CWC15* were affected by stage of development ($P < 0.0001$). Relative to the oocyte, expression remained constant through the 9-16 cell stage and then declined thereafter (Figure 1). Given that the embryonic genome becomes activated at the 8-16 cell stage, it is unlikely that *CWC15* is one of the genes that are upregulated in the period through development of the blastocyst. Further research with embryos at later stages of development will clarify when *CWC15* becomes crucial for embryonic survival. Support: AFRI Grant No. 2013-68004-20365 from USDA NIFA.

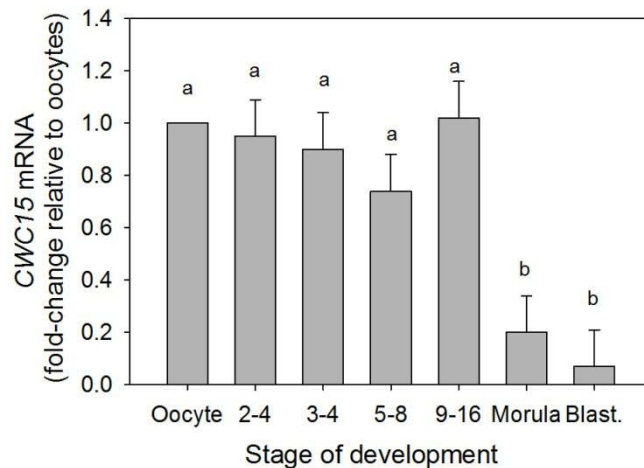


Figure 1. Changes in expression of *CWC15* during preimplantation development. Data are least-squares means \pm SEM. Bars with different superscripts differ ($P < 0.05$).