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Effect of density gradient centrifugation with trypsin on the *in vivo* fertilising capability of bovine spermatozoa

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Abstract

The present study investigated the effect of a novel density gradient centrifugation (DGC) treatment using recombinant trypsin on the *in vivo* fertilising capability of bovine spermatozoa compared with a standard method. In Trial 1, semen collected from Boran and Ankole (*Bos indicus*) bulls was treated either with a silane-coated silica particle colloid formulated for humans with a recombinant trypsin or processed using a standard method (dilution in an egg yolk-based diluent). Semen processed by the two methods was used to artificially inseminate (AI) superovulated cattle. Day 7 embryos were flushed and assessed for fertilisation rates and embryo quality. Trial 2 used a trypsinised silane-coated silica particle colloid formulated specifically for bovine semen. Trial 1 resulted in significantly higher fertilisation rates using the trypsinised human DGC treatment than cows inseminated using the standard method (75.2% v. 67%, respectively; $P < 0.01$), but the numbers of transferable-quality Day 7 embryos did not differ between the two groups ($P > 0.05$). Results for Trial 2 indicated that cows inseminated with the trypsinised bovine DGC treatment had significantly increased fertilisation rates compared with the standard method (88.4% v. 63.1%, respectively; $P < 0.01$) and had significantly higher numbers of transferable-quality embryos (70.3% v. 51.8%, respectively; $P < 0.01$). In summary, bovine sperm treatment before AI by DGC and recombinant trypsin increases fertilisation rates and can result in more transferable-quality embryos compared with standard methods.

Keywords: embryo, recombinant trypsin, sperm processing, washing.

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