

## **Effect of honey as an additive for cryopreservation on bull semen quality from different cattle breeds under tropical condition**

### **ABSTRACT**

Previous studies have demonstrated that honey is a good additive for frozen semen, but the composition of honey is ultimately influenced by the plant species visited by the honey bees, the environment, processing, and storage conditions. Therefore, the main objective of this study was to determine the effect of using local honey derived from the *Apis mellifera* bee as an additive in Bioxcell™ extender for cryopreservation on bull semen quality from different cattle breeds. Different concentrations of honey additive in the commercial extenders (1, 2.5, 5, 10 and 15%) were prepared accordingly. Semen samples were collected from 12 sexually mature bulls consisted of three Mafriwal, three Jersey, three Piedmontese, and three Limousin bulls with the aid of an artificial vagina (AV) and a teaser cow. The semen samples were extended 1:1 (semen: extender) in the prepared extenders for cryopreservation. Semen evaluations were carried out on fresh semen, post-chilled, and 14th days post-thawed frozen semen. The semen samples were evaluated based on microscopic characteristics such as general motility, progressive motility, and liveability. The results showed that there were significant differences ( $P < 0.05$ ) in the sperm quality between different breeds of bull and between different concentrations of honey additive extenders. Jersey bull exhibited the best sperm quality with the highest sperm general motility, progressive motility, and live ability throughout the fresh semen, post-chilled, and post-thawed frozen semen followed by Mafriwal, Piedmontese, and Limousin. The sperm quality of all bull species increased significantly ( $P < 0.05$ ) by the 1% concentration of honey additive extender compared to 2.5, 5, 10 and 15% concentration of honey additive extenders. In summary, 1% concentration of honey additive extender can be used effectively in bull semen cryopreservation to preserve the sperm quality.

**Keyword:** Bull; Cryopreservation; Semen quality; *Apis* spp.; Honey