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**Efficiency of monoclonal antibody specific to Y-chromosome-bearing sperm conjugated with magnetic microbeads on post-thaw sperm during bull sperm sexing**

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**Abstract:**

**Background/Objective:** Sperm sexing is an effective technique to produce female calves in the dairy industry. The purpose of this study is to evaluate the efficacy of a monoclonal antibody (MAb-1F9) against Y-chromosome-bearing sperm (Y-sperm) coupled with magnetic microbeads on post-thaw sperm during bull sperm sexing on sperm quality and the ratio of X-sperm in sexed semen.

**Methods:** Semen samples were collected from two tropical Holstein Friesian bulls. The experiments were divided into six groups by the concentration of MAb-1F9: T1 (0 mg/ml), T2 (0.125 mg/ml), T3 (0.25 mg/ml), T4 (0.5 mg/ml), T5 (1 mg/ml) and T6 (2 mg/ml). The sperm quality was evaluated by computer assisted semen analysis (CASA). The acrosome integrity and the ratio of X-sperm and Y-sperm were assessed using imaging flow cytometry.

**Results:** The results of this study show that MAb-1F9 concentration of 0.5 mg/ml had a total sperm motility of 42.47±4.35%, comparable to the control group (P < 0.05). In addition, the ratio of sperm evaluation showed that the MAb-1F9 concentrations of 0.5, 1, and 2 mg/ml had a high X-sperm percentage in the X-enriched fraction, which was 68.25±1.20%, 70.05±2.62%, and 66.85±4.31% compared to all experimental groups (P<0.05).

**Conclusion:** Consequently, bull sperm sexing using monoclonal antibody with magnetic microbeads of 0.5 mg/ml showed a high tendency to distinguish X-sperm from Y-sperm. This sperm sexing technique is interesting as it increases the proportion of female calves in the dairy industry.

**Keywords:** monoclonal antibody; magnetic microbeads; post-thaw sperm; bull sperm sexing