

## The quality of cows' oocyte derived at different timing regimens of transvaginal follicular puncture

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## INTRODUCTION

Recovery of oocytes from live animals through ultrasound-guided transvaginal follicular aspiration (Ovum Pick-Up, OPU) is an essential element of modern livestock development.

**The aim of our work was to study the effect of two different timing regimens on the quality of oocytes, recovered from cycled heifers (n=4).**

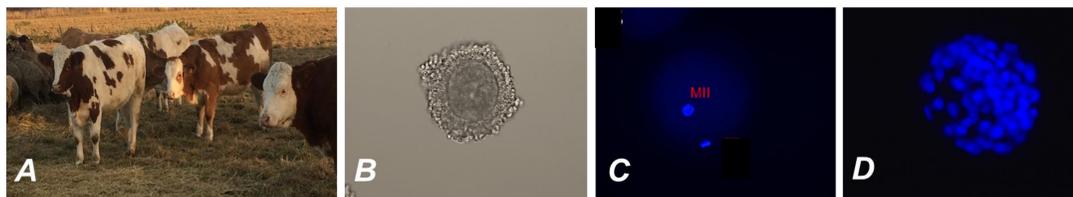
## MATERIALS AND METHODS

The study was performed at Simmental heifers at the age of 17 to 23 months (**Fig. 1A**). Follicle aspirations were performed once a week (1/w, **Group 1**) or twice a week (2/w, **Group 2**). The same donor animals were used for each timing regimens.

## IVM/IVF/IVC

Groups of recovered (cumulus-oocyte complexes COCs) (**Fig. 1B**) were matured in TCM 199 containing 10% FCS, 1 mM Na-pyruvate, 50 µg/ml gentamycin, 10 µg/ml FSH and 10 µg/ml LH for 24 h, fertilized in Fert-TALP for 18-20 h, and cultured in CR1aa medium for 7 days. All steps of IVP were performed at 38.5°C with 5% CO<sub>2</sub> and 90% humidity. The cleavage and blastocysts rates were assessed at Day 2 and 7, respectively. In addition, the Day 7 blastocysts were fixed, and the total cell

**Fig. 1. Images of donors of bovine OPU-oocytes (A), viable bovine COC recovered through OPU (B), matured bovine oocyte (C), Day 7 bovine embryo (DAPI staining of nuclei (blue)) (D)**

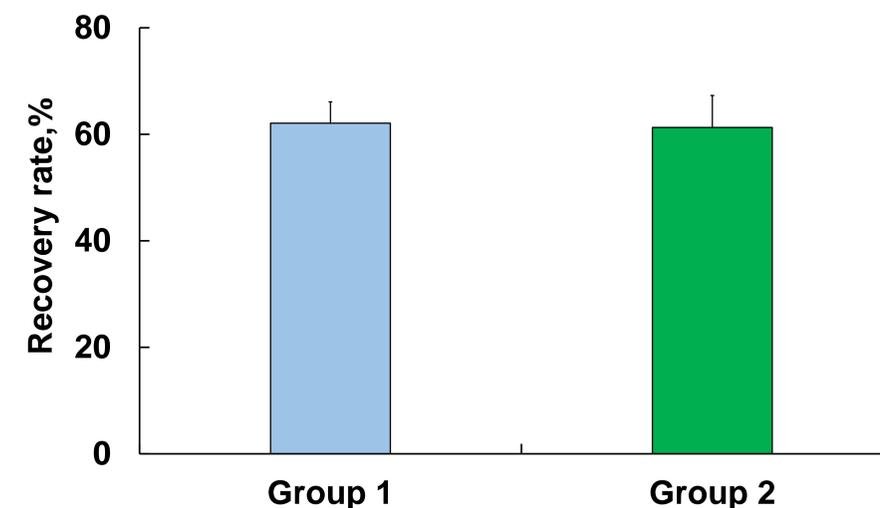


The data were analyzed by ANOVA.

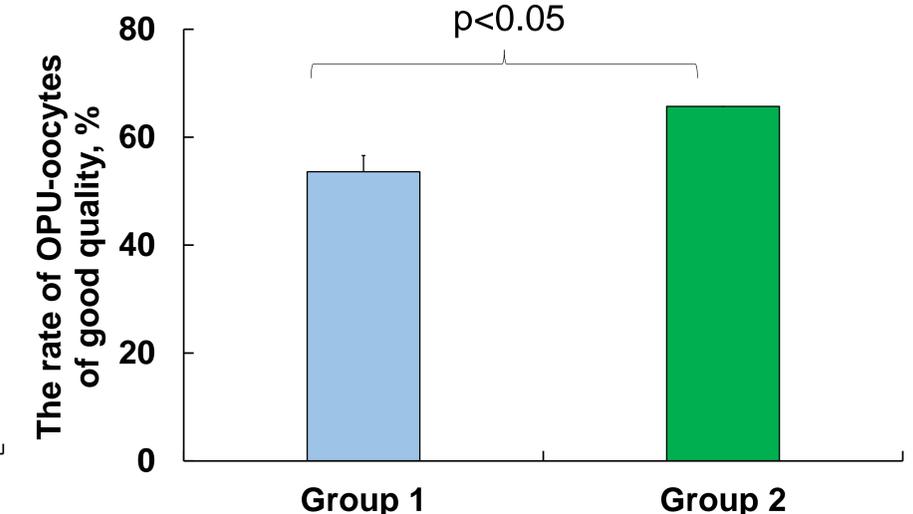
## RESULTS

228 and 224 follicles were aspirated at 2/w and 1/w regimen, respectively, and 280 cumulus-oocyte complexes (COCs) were recovered (140 COCs at each of timing regimen), which corresponds to the recovery rate of 61.4±5.9% and 62.1±6.3% (**Fig. 2**) On average, 4.4 oocytes were received from each donor per session. We observed a significant increase by 1.2 times ( $p < 0.05$ ) of the proportion of OPU-oocytes of good quality, which were characterized by normal morphology, when performing the procedure in the 2/w (Group 2) compared to 1/w (Group 1) regimen (65.7±4.0% vs. 53.6±3.0% of the total number of recovered oocytes, respectively) (**Fig. 1B; 3**). The proportion of oocytes at the MII stage of meiosis after 24 hours of maturation was similar in both groups: 73.3±5.6% (2/w regimen) and 74.7±2.4% (1/w regimen) (**Fig. 1C**). Proportion of oocytes with signs of apoptotic changes was also not significantly differed between the groups: 8.0±3.1 and 9.8±3.3%, respectively. We did not observe the effect of the frequency of OPU sessions on the embryo cleavage rate (on average 63.5%) and the blastocysts development rate (on average 16.7%) (**Fig. 1D**). Our data will be used to optimize the timing regimen of oocyte retrieval from living Simmental donor heifers.

**Fig. 2. Effect of timing regimens of OPU on recovery rate of bovine oocytes**



**Fig. 3. Effect of timing regimens of OPU on quality of bovine oocytes**



## ACKNOWLEDGMENTS

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