Effects of different concentrations of low density lipoprotein in semen extender on the quality of frozen semen in Holstein bulls [1]

Chia-Xin Lee [2][4][5] Ming-Kuew Yang [2] Ting-Yung Kuo [3] and Pin-Chi Tang [4]

Received: Jan. 7, 2020; Accepted: May 8, 2020

Abstract

The purpose of the study was to investigate the effects of concentrations of low density lipoprotein (LDL) in the semen extenders on the quality of semen after frozen-thawed process. Three young offspring, derived from Ten Tons Cows based on DHI data ranking, were chosen in this study. Semen was collected by an artificial vagina and diluted with extenders containing either different percentages of LDL (6, 7, 8, 9 or 10%) or 20% EY (egg yolk, control group) to the final sperm concentration of 3×10^8 cells/mL. The sperm motility, viability, mitochondria activity and acrosome integrity after frozen-thawed process were evaluated by computer-assisted sperm analysis (CASA) and flow cytometer. The results showed that sperms in the group of 8% LDL had significantly ($P < 0.05$) higher viability, acrosome integrity, motlity and progressive motility than the control group. Besides, better motility parameters, including average path velocity (VAP), curvilinear velocity (VCL) and amplitude of lateral head displacement (ALH), were found in the extender with of 8% LDL. In conclusion, the cryopreservation extenders containing 8% LDL maintain sperms good mobility, progressive motility, movement characteristics and viability. This can effectively improve the quality of frozen semen of domestic Holstein bulls.

Key words: Holstein bull, Low density lipoproteins, Cryopreservation.

(1) Contribution No. 2637 from Livestock Research Institute, Council of Agriculture, Executive Yuan.
(2) Hsinchu Branch, COA-LRI, Miaoli 36841, Taiwan, R. O. C.
(3) Breeding and Genetics Division, COA-LRI, Tainan 71246,Taiwan, R. O. C.
(4) Department of Animal Science, National Chung Hsing University, Taichung 40249, Taiwan, R. O. C.
(5) Corresponding author, E-mail: jxlee@mail.tlri.gov.tw.