Thuwapol Kongnoi 2010: Association among Semen Quantity and Quality Traits of Dairy Bulls with Economically Important Traits of Their Progeny in Central Thailand. Master of Science (Agriculture), Major Field: Animal Science, Department of Animal Science. Thesis Advisor: Assistant Professor Skorn Koonawootrittriron, Ph.D.
69 pages.

Semen volume (VOL), semen appearance (APP), abnormal sperm (ABN), concentration (CON), active motile sperm (MOT) and active motile sperm after 24 hrs freezing (M24) were used influence with variation of quantity and quality of semen production. The data (5,127 records) was from semen, which collected from October 2001 through April 2007, of 57 bulls raised in Central Thailand. Breed groups of bulls were classified by Holstein (H) fraction, which were BG1 (0.96 to 1.0 H), BG2 (0.91 to 0.95 H), BG3 (0.86 to 0.90 H), BG4 (0.81 to 0.85) and BG5 (0.75 to 0.80 H). Genetic prediction model for semen quantity and quality traits of dairy bulls considered year-month interaction, ejaculation time, breed groups, age, and ambient temperature at collection time as fixed effects, and the random effects were bulls and residual. Genetic prediction model for accumulated 305 d milk yield (MY305) and age at first calving (CAGE) of bulls' progeny consisted of herd-year-season interaction, age at first calving (only for MY305), and fraction of Holstein as fixed effects, and the random effects were cow and residual. Association between estimated breeding values for traits of bulls and their progeny were calculated. The results revealed that semen from the first ejaculation had higher APP, CON, and MOT, and lower ABN than those of the following ejaculation. Bulls in this study produced semen ranged from 5.33 ± 0.11 ml (BG4) to 6.23 ± 0.07 ml (BG2) for VOL, from 2.21 ± 0.05 scores (BG4) to 2.83 ± 0.05 scores (BG5) for APP, from 11.50 ± 0.15 % (BG5) to 14.15 ± 0.15 % (BG4) for ABN, from 920.65 ± 13.31 $\times 10^6$ cells/ml (BG4) to 1,173.83 ± 13.26 $\times 10^6$ cells/ml (BG5) for CON, from 36.45 ± 0.56 % (BG4) to 45.43 ± 0.56 % (BG5) for MOT, and from 50.33 ± 0.23 % (BG4) to 52.41 ± 0.15 % (BG1) for M24. The first ejaculation had higher APP (2.75 ± 0.02 vs. 2.37 ± 0.04 score), ABN (11.95 ± 0.05 vs. 13.69 ± 0.14 %), MOT (44.21 ± 0.19 vs. 36.93 ± 0.53 %), CON (1,118.85 ± 4.57 vs. 954.11 ± 12.66 x10^6 cells/ml), and M24 (51.66 ± 0.07 vs. 51.04 ± 0.23 %) than the second ejaculation ($P < 0.001$) but not for VOL (5.35 ± 0.04 vs. 6.53 ± 0.11 ml). Higher age bulls had higher APP, CON, and MOT, and lower ABN ($P < 0.01$). Increasing of environmental temperature resulted in increasing of CON and MOT, and decreasing of ABN ($P < 0.01$). Moreover association among semen quantity and quality traits ranged from -0.77 to 0.69. Genetic associations between dairy bulls and their progeny were esxisted ($P<0.05$) for VOL and 305-d milk yiled ($r = -0.27$), ABN and age at first calving ($r = -0.19$), and CON and age at first calving ($r = 0.21$) respectively.

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