

Mattaneeya Sarakul 2010: Factors Affecting Genetic Improvement for Milk Production of Dairy Cattle at Farm Level in Central Thailand. Master of Science (Agriculture), Major Field: Animal Science, Department of Animal Science. Thesis Advisor: Assistant Professor Skorn Koonawootrittriron, Ph.D. 93 pages.

Accumulated 305-day milk yield and pedigree information of 1,921 first lactation dairy cows that calved from 1990 through 2007 in 161 farms in Central Thailand were used to estimate variance components using average information restricted maximum likelihood procedure and predict animal breeding values. The animal model for each trait included herd-year-season, calving age, and regression additive genetic group as fixed effects, and random effects were cow and residual. Estimated breeding values of individual cows that calved in a particular year then were used to estimate genetic trends for each individual farms. Within-farm genetic trends (regression coefficients) were used to classify farms into 3 groups; 1) farms with negative genetic trend ($b < -0.5$), 2) farms with no genetic trend ($-0.5 \leq b \leq 0.5$), and 3) farm with positive genetic trend ($b > 0.5$). Questionnaires, which had questions related to farmer's backgrounds, dairy herd, farm management, decision making, and their opinion on dairy farming were used to gather information from individual farmers and then they were used to study factors affecting genetic improvement for milk production at farm level. Fisher's exact test were used to test association of the studied factors between farm groups. In the study population, the estimate was $628,043 \pm 25,050 \text{ kg}^2$ for phenotypic variation, $212,003 \pm 50,840 \text{ kg}^2$ for genetic variation, and 0.34 ± 0.08 for heritability. Estimated breeding value ranged from -849.22 to 2,448.63 kg for cows, -637.78 to 1,307.40 kg for sires, and -601.34 to 2,448.63 kg for dams. For the whole population, the estimated genetic trends were $0.29 \pm 1.02 \text{ kg per yr}$ for cows, $-1.47 \pm 1.89 \text{ kg per yr}$ for sires, and $1.44 \pm 0.91 \text{ kg per yr}$ for dams. At farm level, most farms (40%) had positive genetic trend (0.63 ± 4.67 to $230.79 \pm 166.63 \text{ kg per month}$) followed by farms with negative genetic trend (35%; -173.68 ± 39.63 to $-0.62 \pm 2.57 \text{ kg per month}$) and those with no genetic trend (25%; -0.52 ± 3.52 to $0.55 \pm 2.68 \text{ kg per month}$). However, all studied factors were not significantly associated between those farm groups, excepted for education background ($P < 0.05$).

Student's signature

Thesis Advisor's signature