

Chittima Kantanamalakul 2010: Genetic Analysis on Growth and Reproductive Traits of Anglo-Nubian, Saanen, Thai Native and Their Crossbreds. Doctor of Philosophy (Animal Science), Major Field: Animal Science, Department of Animal Science. Thesis Advisor: Associate Professor Sornthep Tumwasorn, Ph.D. 131 pages.

Data on growth and reproductive traits of Anglo-Nubian, Saanen, Native and crossbred goats at Yala Livestock Research and Breeding Center were analyzed to estimate breed effects, genetic parameters, breeding values and economic values. The investigated growth traits were birth weight (BW) and weaning weight (WW). These were recorded from 2,857 kids born during the period 1995 to 2005. The reproductive measures were type of birth (TB) and kidding interval (KI) that pertained to 1,487 parturitions from the years 1995 to 2005.

Additive breed and heterosis breed effects for growth and reproductive traits were estimated by using fixed effect models. Maternal additive breed effects for Anglo-Nubian and Saanen as deviation from Native were significant ($P < 0.01$) for BW (0.96 and -1.54 kilograms, respectively) and WW (3.34 and 5.26 kilograms, respectively). The significant heterosis breed effects observed from Anglo-Nubian x Saanen, Anglo-Nubian x Native and Saanen x Native crossing types ranging from -5.03 to 0.63 kilograms for BW and WW. There was no significant difference in direct additive breed effects for Anglo-Nubian and Saanen for reproductive traits. Heterosis breed effect in the cross of Anglo-Nubian and Native was significant ($P < 0.05$) with increasing number of kids born (0.12 heads). Estimation of variance components and parameters were carried out with single-trait and multiple-trait analyses using a derivative-free restricted maximum likelihood procedure. Estimates of direct heritability, maternal heritability and ratio of variance due to maternal permanent environmental effects from single-trait analyses were 0.68, 0.28 and 0.09, respectively for BW. Corresponding estimates were 0.28, 0.10 and 0.04 for WW. Estimates of heritability and permanent environmental variance as a proportion of phenotypic variance of TB and KI were low. The genetic and environmental correlations among BW, WW, TB and KI from multiple-trait analyses ranged from -0.97 to 0.76. Across-breed estimated breeding values for total maternal genetic ranged from -0.37 to 1.03 kilograms for BW and -0.62 to 6.03 kilograms for WW. Across-breed estimated breeding values for direct genetic were from -0.15 to 0.13 heads for TB and -17.34 to 29.84 days for KI. Production and economical data were used to develop profit function for breeding objective. The economic values of breeding objective traits of WW, TB and KI were 86.58, 479.07 and -4.34 baht per unit, respectively.

Student's signature

Thesis Advisor's signature