Nalinee Imboonta 2007: Genetic Parameters and Trends for Reproductive and Productive Traits of a Commercial Landrace Swine Population in Thailand. Doctor of Philosophy (Animal Science), Major Field: Animal Science, Department of Animal Science. Thesis Advisor: Associate Professor Sornthep Tumwasorn, Ph.D. 95 pages.

Data of Landrace sows from one herd in Thailand were used to estimate genetic parameters for production and reproduction traits in first and later (2nd to 9th) parities. The investigated reproduction traits were total number of piglets born per litter (TB), number of stillborn piglets (SB), and number of piglets born alive but dead within 24 hours (BAD). Data were also used to estimate genetic parameters and trends. The investigated reproduction traits were age at first conception (AFC), TB, and weaning to first service interval (WSI), over the first four parities. The reproduction data pertained to 12,603 litters born between 1993 and 2005. The production measures were average daily gain (ADG) and backfat thickness (BF). These were recorded from 4,163 boars and 15,171 gilts. Analyses were carried out with a multivariate animal model using average information restricted maximum likelihood procedures.

Heritability estimates of reproduction traits for first parity were 0.21 ± 0.03 for AFC, 0.03 ± 0.02 for TB, 0.04 ± 0.02 for SB, and 0.06 ± 0.02 for BAD. For later parities, they were 0.02 ± 0.02 to 0.11 ± 0.04 for TB, 0.03 ± 0.04 for SB, and 0.02 ± 0.01 for BAD and for WSI over the first three parities it ranged from 0.16 ± 0.03 to 0.18 ± 0.04. The average heritability estimates for production traits were 0.35 ± 0.02 for ADG and 0.53 ± 0.02 for BF. Genetic correlations between ADG and TB in later parities tended to be favorable, however, they were insignificant when TB in each of parity one to parity four were estimated. Backfat thickness was unfavorably genetically correlated with SB in later parities and the genetic correlations between TB and BAD tended to be unfavorable in all parities. Age at first conception was genetically correlated favorably with TB and WSI in first parity. A moderate unfavorable genetic correlation was estimated between BF and WSI after first litter. Genetic trends were 4.71 ± 1.27 g, -0.23 ± 0.03 mm and 0.23 ± 0.07 days per year for ADG, BF and AFC, respectively. There was no genetic progress for the other traits. It was concluded that selection for low BF will increase SB in later parities and selection for high TB will increase BAD. The result obtained also indicated that selection for low AFC will increase TB and decrease WSI and selection toward reduced BF may have an unfavorable impact on WSI after first litter. Besides, it should be possible to select for ADG and BF without adversely affecting AFC, TB or BAD. The results further revealed that the ongoing selection being used improved growth rate and reduced backfat thickness. However, there was no genetic improvement for TB.

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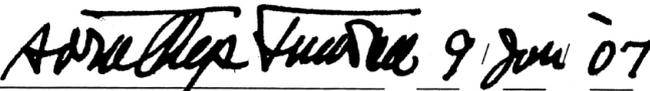
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