Suwatchai Sathitnaitham 2009: Estimation of Breeding Value and Selection Index for Economic Traits in Commercial Swine. Master of Science (Animal Breeding), Major Field: Animal Breeding, Department of Animal Science. Thesis Advisor: Associate Professor Neramit Sookmanee, Ph.D. 95 pages.

The objective of this study was to compare different economic weight method and construct selection index (SI). Nine thousands eight hundreds and twenty seven and 9,513 tested boar and sow recorded were obtained from commercial farm1 and farm2 at the west part of Thailand during 1999-2008. Tested performance of Duroc, Landrace and Yorkshire were gathered to compute genetic parameters and SI. The heritabilities, genotypic and phenotypic correlations of average daily gain of tested pigs from birth (ADGB), average daily gain of tested pigs (ADG), feed conversion ratio (FCR) and back fat thickness (BF) were estimated by Restricted Maximum Likelihood (REML). Multitrait animal model of best linear unbiased prediction (BLUP) were used to estimate breeding values (EBV). Net profitable function regression, prospect and simple relative weight procedure were used to compute and compare SI economic weight. Thirty six SI for boar and sow were constructed but some SI were selected from their respond in all of traits as follow; $I_7 = 0.043(EBV_{ADGB}) - 1.177(EBV_{FCR}) - 0.697(EBV_{BF})$, $I_{10} = 0.015(EBV_{ADG}) - 2.272(EBV_{FCR}) - 0.611(EBV_{BF})$ for three traits in farm1, $I_2 = (EBV_{ADGB}) - 106.080(EBV_{FCR})$, $I_8 = 0.042(EBV_{ADGB}) - 0.729(EBV_{FCR})$, $I_9 = 0.041(EBV_{ADGB}) - 1.041(EBV_{BF})$, $I_{11} = 0.013(EBV_{ADG}) - 1.109(EBV_{FCR})$, $I_{12} = 0.017(EBV_{ADG}) - 0.813(EBV_{BF})$ for two traits in farm1, $I_{25} = 0.018(EBV_{ADGB}) - 3.380(EBV_{FCR}) - 0.681(EBV_{BF})$, $I_{28} = 0.017(EBV_{ADG}) - 3.596(EBV_{FCR}) - 0.825(EBV_{BF})$ for three traits in farm2, $I_{20} = (EBV_{ADG}) + 70.780(EBV_{FCR})$, $I_{23} = (EBV_{ADG}) + 146.020(EBV_{FCR})$, $I_{26} = 0.014(EBV_{ADGB}) - 5.387(EBV_{FCR})$, $I_{27} = 0.023(EBV_{ADGB}) - 0.538(EBV_{BF})$, $I_{29} = 0.008(EBV_{ADG}) - 7.798(EBV_{FCR})$, $I_{30} = 0.021(EBV_{ADG}) - 0.588(EBV_{BF})$, $I_{32} = 0.600(EBV_{ADGB}) - 0.400(EBV_{FCR})$, $I_{35} = 0.600(EBV_{ADG}) - 0.400(EBV_{FCR})$ for two traits in farm2. The SI animal ranking correlations were analyzed. For two traits, SI animal ranking correlation between I_2 and I_8 was 0.83. SI animal ranking correlation between I_{20} and I_{26}, I_{20} and I_{32}, I_{26} and I_{32} were 0.59, 0.98 and 0.74, respectively. SI animal ranking correlation between I_{23} and I_{29}, I_{23} and I_{35}, I_{29} and I_{35} were 0.62 0.93 and 0.85, respectively.

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