RESEARCH INTO A CROSSBREEDING PROGRAM THAT USES HYPERPROLIFIC SOWS

by

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ABSTRACT

Reproductive trait data (18,324 litters) from 2,724 Large White (LW) and 1,780 Landrace (LR) sows, recorded between January 1995 and May 2004, were used to estimate genetic parameters. The traits analysed included total number of piglets born (TNB), born alive (NBA) and weaned (Nwea), average piglet weight at birth (AvBW) and at 21 days (Av21dW) and gestation length (GL). Heritability estimates ranged from 0.11 to 0.23 for NBA, 0.10 to 0.23 for TNB, 0.01 to 0.07 for NWea, 0.28 to 0.50 for AvBW, 0.09 and 0.23 for Av21dW and from 0.31 to 0.49 for GL across breeds (LW and LR) and parities (1, 2 3, and 2-10). Negative genetic correlations were found between litter size traits (NBA and TNB) and weight traits (AvBW, Av21dW), and between litter size traits (NBA and TNB) and NWea. First litter records should be regarded as a different trait than performance recorded in later parities (genetic correlations ranging from 0.61 to 0.84) with the exception of GL and NWea in LR sows.

Direct piglet heterosis estimates were non-significant ($P>0.05$) for TNB (-0.02%), NBA (+0.6%), NWea (-1.1%) and Av21dW (+0.4%) while AvBW (+1.3%) and GL (-0.1%) had significant ($P<0.05$) levels of heterosis. Sow and litter inbreeding (F) levels were higher in LW than in LR (F-sow: 5.74 versus 2.7; F-litter: 5.0 versus 2.2). Inbreeding depressions ranged from -0.15 to -0.46 piglet for NBA; from -0.09 to -0.49 piglet for TNB; from -0.3 and -0.58 piglet for NWea; from -8.4 to -412 gr for Av21dW; from +6.4 to -35.4 for AvBW and from 0.14 to -0.14 in GL for an increase in inbreeding level of 10%.

Commercial data were available for 2,637 F1 sows from two piggeries with 10,817 litters recorded between July 1995 and October 2004. This crossbred performance was regressed on the EBVs of purebred dams. Regression coefficients of dams EBVs for the same trait were not significantly ($P>0.05$) different from the expected 0.5 for NBA, AvBW and Av21dW in both dam breeds. Regression coefficients from the regression of NWea of F1 sows on AvBW EBV and Av21dW of

LW and LR dams were 0.12 and -0.09 for AvBW EBV and 0.01 and 0.34 for Av21dLW EBV. Inclusion of AvBW EBV in LW and inclusion of Av21dW EBV in LR breed as selection criteria are recommended to enhance the NWea performance of F1-sows at the commercial level.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APENDICES

ABBREVIATIONS

BREEDS OF PIGS

LW	Large White
LR	Landrace
Y	Yorkshire
H	Hampshire
DU	Duroc
PI	Pietrain
MC	Mong Cai
CS	Cinta Senese

REPRODUCTIVE TRAITS

NBA	Number of Piglets Born Alive
TNB	Total Number of Piglets Born
NWea	Number of Piglets Weaned
AvBW	Average Piglet Birth Weight
Av21dW	Average Piglet Weight at 21 days
AvWW	Average Weaning Weight
GL	Gestation Length