

RESEARCH INTO A CROSSBREEDING PROGRAM
THAT USES HYPERPROLIFIC SOWS

by

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A THESIS SUBMITTED FOR THE DEGREE OF

MASTER OF SCIENCE

OF THE UNIVERSITY OF NEW ENGLAND

August, 2005

Animal Genetics and Breeding Unit

ACKNOWLEDGMENTS

I would like to thank Jeff Braun for providing me with the opportunity to work in this very exciting project. I'm deeply grateful for the financial support, the encouragement and constant help provided by Jeff as well as the hospitality and kindness shown in my stay at Mount Gambier by himself as well as by Tom and Andrea.

I'm deeply grateful to Hans Graser for believing in me, and giving me the chance to work in this project, and always being there for answering my queries and supporting me as my supervisor. "It was a real honour for me to work with you".

My principal supervisor, Susanne Hermesch has been an invaluable contributor to this thesis, from day one till last minute corrections, she had been there helping me in every aspect of this Masters. An enormous amount of work and patience was required by Susanne in her supervisor's role and she did a great job. "I'm deeply indebted to you".

To Myora Farm's staff members, a big thank you goes to all of you, for making my stay at Mount Gambier a 'wonderful experience'. I would also like to thank Peter and Jenny McMahon, Rob and Nancy McLean for their hospitality and kindness. I also thank John Lunn's and Graham Mee's families for their help.

I want to thank Mike Traverner and the people from APL for providing me with such a great experience during the PigGrad meetings. Thanks Mike and Ben for your constant support and for sharing all you experience with us.

Thank you to the members of AGBU. Everyone has been very helpful and very considerate when asked for help. I'll miss the Friday's morning teas, AGBU Seminars and JClub's discussions.

Huge thanks goes to my fellow students and friends, starting with Alvaro Simeone that helped me enormously in the first stages of this Masters, all his expertise and encouragement were very important for me. Sansak Nakavisut, was my “un-official third supervisor”. “I cannot thank you enough for all the help I got from you”. I would like to thank Chanda, Cedric, Simone, Ignacio, Magda, Benjamin, Graciela, Leo, Manuela and all the “Armidale’s latin community”. Finally I want to thank all my friends from Chivilcoy & Buenos Aires that despite such a long distance they made me feel like I had never left.

I would like especially to thank my wife Nerina for always being there supporting me, in the good and bad times. “Nothing of what I did in this period of my life would be possible without your love and support”. My family has played a very important role in my personal and professional achievements, and this one is not the exception. “I want to thank you all for your encouragement and support when this trip to Australia looked like a crazy idea for a lot of people. Thank you for always being there even at such long distance, and finally I would like to dedicate this thesis to each and every one of you”.

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.

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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