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Genetic Improvement in a Texel Breeding Operation: A case study & Maximising Pedigree Accuracy for Genetic Gain: A comparison of DNA-assigned parentage and lambing book assigned parentage

A report prepared on behalf of
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Genetic Improvement in a Texel Breeding Operation: A case study

&

Maximising Pedigree Accuracy for Genetic Gain: A comparison of DNA-assigned parentage and lambing-book assigned parentage

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Abstract

There were two main aims to this research. The first was to carry out an investigation of the genetic gain of Landcorp Farming Limited's Waikite Texel breeding operation. This was in order to identify factors that may have been limiting $\Delta G$ and the financial return of the system and make recommendations for improvement.

It was found that the achieved mean $\Delta G$ of 33¢/ewe/year was less ($P<0.05$) than that predicted for the Innervalue Fat Index at 97¢/ewe/year. Financially the system was found to have made a net return over the course of the studied period; however, this was less than what was predicted as possible. The main cause of this shortfall was the majority of genetic selection being imposed on live-weight BVs rather than Index values. This investigation also found that there was little room for improvement in the ewe and ram generation intervals with hogget mating and maintenance of current levels being recommended for L. While the ram selection intensity had little room for improvement, the ewe selection intensity did and this is achievable by imposing less selection pressure on structural traits and more on genetic merit.

The second aim of this research was to compare lambing-book dam records and DNA-assigned dam records in order to identify management practices that would target the minimisation of pedigree identification error. Triplets and lambs born to older dams were found to be the groups most at risk of having incorrect lambing-book data, while singles had a lower mean probability that the DNA identified dam was correct.

Although DNA parentage testing was not found to financially benefit a system, it did offer the opportunity to reduce pedigree error through the use of a variety of practices. These practices include: single sire mating of ewes, lambing ewes in mobs of equal or near equal proportions from each sire group, lambing in mobs based on scanning rank, carrying out two or more checks per day on ewes during lambing, and increase the number of markers used in the DNA parentage assignments of groups most at risk from incorrect parentage assignment if financially feasible.
Preface

The figures presented in this research are estimates only and intended to give a guide to improving system management rather than being exact performance figures. They should therefore be used accordingly.

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Contents
Abstract ................................................................................................................................................... 3
Preface .................................................................................................................................................... 4
Acknowledgements ................................................................................................................................. 4
Figures ..................................................................................................................................................... 7
Tables ...................................................................................................................................................... 8
Chapter 1 Introduction ........................................................................................................................... 8
Chapter 2 Literature Review ................................................................................................................. 11
  2.1 Sheep Industry and Genetic Improvement ................................................................................. 11
    2.1.1 Industry Structure .......................................................... 11
    2.1.2 Sheep Improvement Limited ................................................. 12
  2.2 On Farm Genetic Improvement .................................................................................................. 13
    2.2.1 Breeding Objectives .......................................................... 14
    2.2.2 Genetic Variation and Prediction of Genetic Merit ............................................................. 15
    2.2.3 Components of Genetic Gain .................................................. 19
    2.2.4 Other Considerations .......................................................... 25
  2.3 Financial Implications of Genetic Gain ........................................................................................ 34
    2.3.1 Economic Values .............................................................. 34
    2.3.2 Financial Considerations in Animal Breeding - Now and in the Future ......................... 35
    2.3.3 Application to Farming Systems .............................................. 39
  2.4 Aim of Research .......................................................................................................................... 40
Chapter 3 Genetic Gain ......................................................................................................................... 41
  3.1 Introduction ................................................................................................................................ 41
  3.2 Methods ...................................................................................................................................... 41
    3.2.1 Data ...................................................................................... 41
    3.2.2 Genetic Trend in Index .......................................................... 42
    3.2.3 Components of Genetic Gain .................................................. 43
    3.2.4 Estimated Genetic Gain ......................................................... 47
    3.2.5 Inbreeding ............................................................................. 47
    3.2.6 Sensitivity of Genetic Gain and Financial Implications ................. 48
  3.3 Results ......................................................................................................................................... 55
    3.3.1 Base System Overview ......................................................... 55
    3.3.2 Genetic Trend in Index .......................................................... 57
    3.3.3 Components of Genetic Gain .................................................. 58
Figures

Figure 2.1  Adapted from data from Garrick et al. (2000) and Crawford et al. (2007) this graph shows the estimated percentage of the New Zealand nucleus flock animals that are DNA parentage tested by Genomnz\textsuperscript{TM}, one of the major companies providing such services in New Zealand. .................................................................31

Figure 3.1  Mean Index value of lambs born each year between 2000 and 2009 inclusive. ...57

Figure 3.2  Ewe, ram and average L calculated from parental contribution to lambs weaned .........................................................60

Figure 3.4  Showing the ewe L\textsubscript{Rep} and L for the studied period .......................61

Figure 3.5  Showing the ram L\textsubscript{Rep} and L for the studied period .........................61

Figure 3.6  The proportion of ewe lambs retained as replacements by dam age group ........62

Figure 3.7  The proportion of rams retained as replacements by dam age group ...............63

Figure 3.8  Average proportion of sales by dam age group .............................................64

Figure 3.3  Selection intensities for ewes and rams and the overall flock mean for the period 2000 - 2009 .................................................................67

Figure 3.9  Predicted change in mean index value for the Innervalue Fat and Lean indices and the achieved change in mean index value ........................................68

Figure 3.10 Estimated annual $\Delta G$ made under different treatments influencing age structure applied to the base system for the Fat Index (see table in methods). Showing percentage deviation from base system ..........................................................72

Figure 3.11  Effects of changing flock selection practices on $\Delta G$ in the Fat index. Showing percentage deviation from the base system ..........................................................74

Figure 3.12  Average discounted gross margin per S.U. per year from ten years of purchasing rams from systems under actual gain, and gain in the Innervalue Fat and Lean Indices. Showing two different ram prices for systems mating hoggets and not mating hoggets. .....76

Figure 4.1  The cumulative frequency of P\textsubscript{dam} values for all lambs DNA tested. ............91

Figure 4.2  The effect of lambing-book error on the change in mean index value over a period of ten years for the Innervalue Fat index ........................................................................................................................................97
Tables

Table 3.1 Treatment of base system to analyse the effect of changing parent age structure on the financial costs/benefits of $\Delta G$ ................................................................. 53
Table 3.2 Changes to management practices to analyse the sensitivity of the financial costs/benefits of the base system ........................................................................................................ 54
Table 3.3 Stock reconciliation for Landcorp Farming Limited Waikite Texel flock showing average stock numbers and movements between July 1st and June 30th ............................. 56
Table 3.4 Genetic and phenotypic co-variances and genetic standard deviations for the Fat index ............................................................................................................................... 58
Table 3.5 Genetic and phenotypic co-variances and genetic standard deviations for the Lean index ............................................................................................................................... 59
Table 3.6 Average percentage of animals culled for various traits ............................................. 64
Table 3.7 Mean BV of the top 160 ewe lambs born per year based upon selection on Index value, eight month live-weight BV and 12 month live-weight BV .............................................. 65
Table 3.8 Mean BV of the top eight ram lambs born per year based upon selection on Index value, eight month live-weight BV and 12 month live-weight BV .......................................... 66
Table 3.9 Summary of financial implications for actual management practices carried out between 2000 and 2009 inclusive .............................................................................. 69
Table 3.10 Summary of financial implications of estimated and achieved $\Delta G$ with HM .......... 69
Table 3.11 Summary of financial implications of estimated and achieved $\Delta G$ with hoggets not mated .................................................................................................................. 70
Table 3.12 Summary of the average annual effects of costs and returns on the gross margin of a system mating hoggets for the Innervalue Fat index and actual gain achieved .......... 70
Table 3.13 Summary of the average annual effects of costs and returns on the gross margin of a system not mating hoggets for the Innervalue Fat index and actual gain achieved ......... 71
Table 3.14 Effects of changing flock age structure on the financial outcomes of 10 years of continuous selection on Fat Index while mating hoggets. Showing the percentage difference from the base systems as in Table 3.9 & Table 3.10. ......................................................... 73
Table 3.15 Effects of changing flock age structure on the financial outcomes of 10 years of continuous selection on Fat Index while not mating hoggets. Showing the percentage difference from the base systems as in Table 3.9 & Table 3.10 .......................................................... 73
Table 3.16 Financial effects of changing flock selection practices in systems mating hoggets. Showing the percentage difference from the base system .............................................................. 75

Table 3.17 Financial effects of changing flock selection practices in systems not mating hoggets. Showing the percentage difference from the base system ........................................ 75

Table 4.1 Numbers of lambs recorded in lambing-book and DNA file .................................................................................................................................................. 93

Table 4.2 Average litter born, weaned and DNA tested statistics for singles, twins and triplets ................................................................................................................................................. 94

Table 4.3 Mean P_dam values of all lambs DNA tested by litter size. ................................................................................................................................................. 94

Table 4.4 Numbers and percentages of identified dams matched by litter size between the lambing-book and the DNA-assigned parentage. Across P_dam groups and totals ................................................................................................................................................. 95

Table 4.5 Numbers and percentages of identified dams matched by sex of lamb between the lambing-book and the DNA-assigned parentage. Across P_dam groups and totals .................................................................................................................................................. 95

Table 4.6 Numbers and percentages of identified dams matched by lambing-book dam age between the lambing-book assigned parentage and the DNA-assigned parentage. Across P_dam groups and totals .................................................................................................................................................. 96

Table 4.7 Comparison of the financial performance per S.U. of the base system for the Innervalue Fat Index mating hoggets (presented in Chapter One) with no DNA parentage testing costs, assuming no lambing-book pedigree error, a 7% lambing-book error and a 20% lambing-book error .................................................................................................................................................. 98

Table 4.8 Comparison of the financial performance of the base system for the Innervalue Fat Index not mating hoggets (presented in Chapter One) with no DNA parentage testing costs, assuming no lambing-book pedigree error, a 7% lambing-book error and a 20% lambing-book error .................................................................................................................................................. 98

Table 4.9 The frequency of shepherding during the lambing period carried out on stud farms in a survey of 400 New Zealand Sheep farms by Brock et al. (2003) ............................................................................. 103