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**A strategic evaluation of the introduction
of the East Friesian sheep breed on a
North Island hill country farm.**

A thesis submitted in partial fulfilment of the requirements for
the degree of Masterate in Applied Science in Agricultural
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Abstract

New Zealand sheep farming has changed dramatically over the past 20 years as it has adjusted to a market-led and unsubsidised economy. Despite this, new technology and management practices such as cross breeding offer exciting opportunities for improving sheep industry profitability. The introduction of new genetic material into the sheep flock can provide benefits through improved productivity and product attributes but it may also have negative consequences for industry growth if used incorrectly. The advantages of introducing a new sheep breed to a farm are usually widely published but not necessarily well researched. The East Friesian (EF) was made available to farmers in autumn 1996. It has a reputation for being highly fertile, a good milk producer and heavy-weight-lamb producer. However, no research has been published on how to develop a profitable management strategy for adopting EF's onto a hill country property. The purpose of this study was to test the hypothesis that the EF would improve the productivity and profitability of a lower North Island hill country farm.

A case farm analysis using the STOCKPOL farm simulation model was used to compare the productivity and profitability of the current Romney (Rn x Rn) flock with either an East Friesian (EF) x Rn crossbred flock or a purebred EF x EF flock. The STOCKPOL model was calibrated to simulate the existing sheep and beef cattle policy for the 324 ha hill country farm, Tuapaka. Pasture growth rate data were adjusted to sustain the reordered levels of animal production and establish a basis against which the EF x Rn and EF x EF flocks could be compared. The cattle policy was fixed for all options. Ewe numbers, with a 20 % replacement rate, were adjusted for the live weight profiles and production levels of the EF x Rn (67 kg at mating; 148 lambs born:100 ewes mated) and EF x EF (80 kg at mating; 230 lambs born:100 ewes mated) breeds until the farm system was just biologically feasible. This indicated 1315 EF x Rn sheep or 909 EF x EF could be farmed compared to 1930 Romneys (52 kg; 117 lambs born:100 ewes mated). In stock unit terms (SU) the EF x Rn was 1.25 and the EF x EF 1.54 compared to the Rn x Rn ewe (1.00) which consumed 526 kgDM per year.

The STOCKPOL outputs were copied into an enterprise margin (EM) format and the profitability of the sheep breeds calculated after adjusting for the cost of capital (CoC) of sheep wintered. The EM's (per ha) were \$324, \$340 and \$351 for the Rn x Rn, EF x Rn and EF x EF breeds, respectively. The EF x EF was the preferred option for all risk preferences. A sheep age structure model was developed to simulate the transition to an EF x Rn crossbred flock. This took six years. The additional net present value (NPV) in 1998 dollars of the EF x Rn vs. the Rn x Rn was \$ 92,133. The transition to a purebred EF flock would take 24 years if a grading up strategy were adopted.

An important finding was the breed x pasture production interaction. Annual pasture consumption was 869 t DM for the Rn x Rn flock, 780 t DM for the EF x Rn policy and 647 t DM for the EF x EF flock. Reduced pasture production occurred because of the higher lamb:ewe ratio of the EF sheep contributed to increased pasture senescence and decay in the summer and autumn. Ways to prevent this occurring need to be explored through further modelling studies using

STOCKPOL and by evaluating the experience of farmers who have adopted EF's. The study confirmed the hypothesis: EF sheep would improve production and profit on the hill country case farm. Recent farmer experience with the East Friesian should now be evaluated against this result.

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