

Abstract of a Dissertation submitted in partial fulfillment of the requirements for the Degree of M.Appl.Sc

Measuring Changes in Productivity on Individual Dairy Farms

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New Zealand is no longer the worlds lowest cost producer of milk. As a result the New Zealand dairy industry through Dairy InSight has identified the need for a 4% per annum increase in productivity for the industry to remain internationally competitive and to counteract declining terms of trade. Although there are measures which can be used to measure productivity at the aggregate farm level, there is currently no measure of productivity that can be easily applied to the individual farm. This study investigates cost of production/kg MS key performance indicators as proxy measures for productivity at the individual farm level.

Nine farms were analysed including the Lincoln University Dairy Farm. Financial data from at least four years was obtained and was comprehensively analysed. Three cost of production measures were applied to the data. These were, FOCCBIT (farm operating cash costs before interest and tax), ECID (economic costs including depreciation) and ECIDAC (economic costs including depreciation and capital). The cost of production measures can be used as proxy measures for productivity as they are not related to product prices, unlike profitability and liquidity measures.

A 4% imputed cost of capital figure was used to include the cost of capital in the ECIDAC measure. The total FWE needs to be deflated using the Farm Expense Price Index to ensure that any comparisons made are undertaken on a constant dollar basis.

A certain amount of discretion can be used when using the measures, for example if the “non milk income” is less than 10% it can be omitted from the measures without a major impact on the results. If it is greater than 10% then it needs to be included. When using the measures, consistency is vital. The figures used in the calculations must be the same throughout the entire period being observed. Changes in business or management

structure can provide inaccurate measures of productivity, and therefore the periods with differing structures need to be treated as different sets of observations.

The main drivers of the productivity measures are Farm Working Expenses (FWE), “non milk income” and cost of Total Farm Capital (TFC). All of the measures have a relationship with FWE and “non milk income”. The ECIDAC measure also has a close relationship with cost of TFC. The identification of these main drivers may enable farmers to target specific strategies in relation to these drivers to contribute towards productivity gains. If these costs can be minimised and MS production maximised then productivity gains can be made.

The FOCCBIT measure is the easiest to calculate. It gives a good indication of productivity trends as it requires the least amount of information and may give the clearest indication of productivity trends. The ECID measure encompasses the economic cost of depreciation; it is therefore more robust than the FOCCBIT measure. Due to its increased sophistication, the ECID measure has a higher data requirement, and subsequently, the measure can be compromised if data is not accurate. The ECIDAC measure is the most sophisticated of the measures and therefore has the highest input data requirement. Its accuracy can also be compromised if data is not 100% accurate and consistent.

Key Words: productivity, dairy farming, cost of production, finance, farm working expense, total farm capital

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Glossary and Definitions

FOCCBIT	Farm Operating Cash Costs before Interest and Tax
FCID	Farm Costs Including Depreciation
FCIDAC	Farm Costs Including Depreciation and Capital
LUDF	Lincoln University Dairy Farm
FWE	Farm Working Expenses, FWE are defined as: Total dairy farm cash expenditure, including labour, stock, feed, other working expenses and overheads (DairyBase Reference Manual, 2006)
TFC	Total Farm Capital
GFI	Gross Farm Income
MS	Milk Solids
Kg	Kilograms
“Non Milk income”	All income that is not received from milk such as livestock and rebates. “Non milk income” = GFI – Milk Revenue.
EBIT	Earnings before interest and tax, calculated as FWE – Milk Revenue.
Cash Surplus or Deficit	Surplus after tax, drawings and capital purchases