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Evaluating expansion strategies for startup European Union dairy farm businesses

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ABSTRACT

A stochastic whole-farm simulation model was used to examine alternative strategies for new entrant dairy farmers to grow and develop dairy farm businesses in the context of European Union (EU) milk quota abolition in 2015. Six alternative strategies were compared: remain static, natural growth expansion, waiting until after EU milk quota abolition to expand, a full-scale expansion strategy without milk quotas and not incurring super levy penalties, a full-scale expansion strategy with milk quotas and incurring super levy penalties, and once-a-day milking until EU milk quota abolition, followed by full-scale expansion. Each discrete whole farm investment strategy was evaluated over a 15-yr period (2013–2027) using multiple financial stability and risk indicators, including overall discounted farm business profitability, net worth change, return on investment, and financial risk. The results of this study indicate that, although associated with increased risk, dairy farm expansion will ensure the future profitability of the farm business. Within the context of EU milk quotas until 2015, the most attractive expansion strategy is to increase cow numbers while avoiding super levy fines using once-a-day milking techniques, increasing to the full capacity of the dairy farm once milk quotas are removed. In contrast, the results also indicate that dairy farms that remain static will experience a significant reduction in farm profitability in the coming year due to production cost inflation. Cash flow deficits were observed during the initial year of expansion and, therefore, rapidly expanding dairy farm businesses require a significant cash reserve to alleviate business risk during the initial year of expansion. The results of this analysis also indicate that dairy farm businesses that expand using lower cost capital investments and avoid milk quota super levy fines significantly reduce the financial risks associated with expansion.

Key words: Ireland, expansion, new entrant dairy, cash flow

INTRODUCTION

In joining the European Community in 1973, Ireland availed of guaranteed access to European Union (**EU**) markets and product price supports afforded by the EU Common Agricultural Policy (**CAP**). As part of CAP, milk quotas were introduced in 1984 to control milk supplies, stabilizing milk price and thereby providing stable and relatively high milk prices for milk producers. As part of the 2008 Health Check review of CAP policy (European Commission, 2012) and in light of increased international pressure to remove trade barriers, the decision has been made to fully remove milk quotas in 2015. This policy change gradually increased milk quotas to create a soft landing around milk quota removal. This has resulted in a 2% quota increase in 2008, followed by a further 1% per annum increase from 2009 to 2013, with a reduction in the fat correction associated with milk fat (IPTS, 2009). Milk quota abolition is anticipated to facilitate expansion for dairy farmers to increase operational scale, thereby increasing the profitability of their farming businesses into the future (Ramsbottom et al., 2012).

From an Irish perspective, milk quota abolition has been identified as an opportunity for significant expansion in the dairy industry, owing to the low-cost comparative advantages associated with Irish grass-based production systems (Lips and Rieder, 2005; Dillon et al., 2006; van Berkum and Helming, 2006). As dairy production is the most profitable agricultural enterprise (Hennessy et al., 2011), growth within the Irish dairy industry will originate from both the expansion in milk production on existing dairy farms, as well as the entry of new entrant dairy farmers to milk production from other enterprises. To encourage new dairy enterprises, the Irish government has allocated one-quarter of the country's 1% annual increase between 2009 and 2013 in milk quota to new entrants to dairying. Approximately 230 new dairy farm applicants have each received a 200,000 L-of-milk quota over the initial 3 yr of the

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scheme, with a further 170 applicants anticipated to join by the year 2015 when milk quotas are abolished.

Expansion in dairy farming will require both new and existing dairy farmers to develop sustainable financial plans taking cognizance of the choice of production system, expectations for animal performance, output prices, input costs, and capital investment requirements in the longer term. The immediate challenge facing many dairy farmers is to plan farm business expansion through the period in advance of milk quota abolition in 2015. Many complex interrelated factors must be considered and simulation models have been developed to identify optimum management strategies and help understand the interactions occurring between the production system, financing structures, inflation, farm inputs and outputs, and price volatility (Parsons et al., 1983; Shalloo et al., 2004a; Geary et al., 2010). Such models also have the capacity to evaluate the feasibility of alternative management strategies, such as the optimal rate of farm business growth, rate of capital investment and allocation of resources effects on financial return, and risk to the farm on a long-term basis (Herrero et al., 1999; Shalloo et al., 2004b). The objective of the current study was to examine alternative expansion strategies for new entrant dairy farmers, taking cognizance of the implications for farm system performance, capital investment and financing costs, EU milk quota super levy exposure, overall farm business profitability, risk, and net worth change using the Moorepark Dairy Systems Model (**MDSM**; Shalloo et al., 2004a).

MATERIALS AND METHODS

New Entrant Data Set

The new entrant dairy farm data used in the model was based on the actual business plans and application forms from the new entrant farmers as they applied for the milk quota from the Irish Department of Agriculture, Food and the Marine (Dublin, Ireland). A detailed characterization of the existing assets and business plans and expectations of the 230 successful new entrant dairy farmers' data has been reported previously (McDonald et al., 2012) and the main characteristics are summarized in Table 1. The average new entrant dairy farm has 58 ha of land available, which will be initially lowly stocked at 1.74 dairy livestock units per hectare. The expected annual milk production of new entrant businesses is 654 kg of milk solids/ha (fat plus protein kilograms), with an average milk yield of 4,954 kg per cow. The business plans also indicate that the majority of new entrants require a substantial loan to accompany their existing equity to develop a new dairy enterprise. Although the average age of new entrants is 36, almost 40% of new entrants have existing loan commitments and are hoping to secure a loan to fund the full setup costs, with the majority earmarked for the development of milking parlors, animal accommodation, and the purchase of dairy stock. The actual land area available and milk quota available was used in the model. A single farm payment is also available to the new entrants but was not used in the model due to the uncertainty of future payments due to CAP reform.

Table 1. General characteristics of new entrant dairy farms (McDonald et al., 2012)

General characteristics	Average
Age (yr)	36
Farm system characteristics	
Land area farmed (ha)	58
Herd size (no. of cows)	70
Replacements (no. of heifers)	24
Stocking rate (LU/ha)[1]	1.74
Milk yield (L/cow)	4,950
Milk solids (kg/cow)	381
Total annual milk supply (L/farm)	352,000

[1]LU = livestock units.

Bioeconomic Model

The MDSM (Shalloo et al., 2004a) is a stochastic budgetary simulation model. The model itself provides a comprehensive simulation framework merging the biological, physical, and economic processes into a model. The model combines the main segments of the dairy farm structure, including stock inventory and valuation, milk supply, feed requirements, utilization of land and labor, and financial and economic analysis (Shalloo et al., 2004a). The key output from the MDSM model is the estimated distribution of farm profit, determined by total receipts (milk, calves, and cull cows) less all variable costs (fertilizer, veterinary costs, AI, silage, and contractor charges), and fixed costs (maintenance and running costs, car, telephone, electricity, and insurance) based on prices deemed feasible by the projections estimated by Binfield et al. (2008). The farm financial reports originate from equations linking the total receipts, costs, and capital investment. Sensitivity analysis of each scenario was undertaken based on low and high farm investment costs, including dairy building and grassland infrastructure, in addition to alternating between low and high loan interest rates.

Stochastic Budgeting

A stochastic simulation was included in the analysis of the New Entrant expansion options. The stochastic simulation was carried out using the computer software