A comparison of future dairy farm systems in Manawatū and Canterbury regions of New Zealand

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Abstract
Designing future farming systems which are resilient in an increasingly volatile environment is challenging and new approaches are needed that capture industry creativity in response to political, social and economic pressures. One approach to addressing this challenge is using scenario planning as the basis of farm systems design. In a previous phase of this project, three distinct future world scenarios were developed – Consumer is King, Governments Dictate and Regulation Rules. In this part of the project, dairy farm systems for each of these future scenarios were developed at workshops with local dairy farmers. Possible regional differences were explored by conducting each pair of workshops separately in the Manawatū (Massey University) and Canterbury (Lincoln University) regions. At the workshops, participants made explicit in group exercises their mental models conceptualising possible future farm systems for their region under each of the three scenarios. This paper identifies and describes the similarities and differences between the future dairy farm systems for the Manawatū and Canterbury regions under each of the three scenarios. In general, the farm systems were largely similar between them for the GD scenario but there were regional system differences under the CK and RR scenarios.

Keywords
scenarios; participatory planning; mental models; farm management; 2025

Introduction
Designing resilient future farming systems in increasingly volatile and uncertain business and natural environments is challenging. While farm systems modelling often extrapolates the future from the current situation, this approach may not be ideal given the uncertainty and volatility inherent in the industry. Schoemaker (1993, 1995) suggested scenario analysis could be a useful approach in such circumstances. It has previously been used in an agricultural context both overseas (Dairy Australia 2013) and in New Zealand (Parminter et al. 2003), and was applied in this study.

In the first phase of this dairy farm systems project, four distinct future world scenarios impacting on New Zealand dairying were developed at farmer and industry workshops at both Lincoln and Massey Universities (Shadbolt et al. 2015). These were a consumer-driven ‘Consumer is King’ scenario, (CK) a highly regulatory ‘Regulation Rules’ scenario (RR) a political chaos based ‘Governments Dictate’ scenario (GD) and a base scenario which was extrapolated from present trends.

In the second phase of this project, dairy farm systems for the three alternative scenarios were developed by stakeholders at Lincoln (Canterbury) and Massey (Manawatū) Universities. This paper provides an overview of the significant similarities and differences between Manawatū and Canterbury dairy farm systems for each of the three alternative scenarios.

Methods
A detailed explanation of the methodology used, its rationale and limitations are provided in Dooley et al. (2018). In brief, this study was based around two workshops held at each university in 2015; a farmer workshop followed by an industry workshop. At each of the workshops, participants working in groups
were asked to make explicit their mental farm system models in response to each scenario (Vennix 1996). This paper describes the results of the farmer workshops.

Results and Discussion

Consumer is King

In this scenario, by 2025, the world has had considerable economic growth. Driven by wealthy and fickle consumers, food has become another status symbol. The food market is highly diversified, complex and rapidly evolving alongside other fashion products. Niche supply chains develop around peoples’ values and their need to know where food has come from and how it is being produced.

The farmers at both Massey and Lincoln considered that in this scenario there would be more corporate farms although Massey farmers expected ownership to include a range of different options including opportunities for smaller farms or group of farmers with niche supply chains. Farming systems would be increasingly diverse and flexible. Farmers expected more production to be contracted to meet market specifications for products and their production attributes. Some farmers expected the dairy industry to be vertically integrated with processors and exporters having a financial interest in the farm production systems. Other farmers with niche milk products could have their own supply chain directly linked to consumers. Farms would produce milk all year round. Diverse cow breeds and feed stuffs would result in milk of different qualities. High standards of animal health, animal welfare and working conditions (e.g. 40hr working week) were required.

The Massey farmers designed grass-based systems as soft systems models (Checkland 1999) with some specialist feeds and nutrients brought-in. Lincoln farmers considered that these cows would be housed for greater farm automation, animal monitoring and control. The housed cows would require cut-and-carry pasture and diverse feeds. They also suggested genetically modified pastures would be used, along with ‘natural’ plant nutrients and biological control of weeds and pests.

Massey and Lincoln farmers expected their farm staff to be highly skilled and able to draw on technical specialists. Massey farmers assumed that farms would be fully automated whereas Lincoln farmers expected there to be a lot of semi-skilled labour on contract. In both cases working conditions for staff would be improved (e.g. 40hr week).

Governments Dictate

By 2025, World political instability is common with concerns regarding food security. Trade is highly protected and food aid has become large scale. Consumer demand is for basic, nutritionally-dense foods and the margins for agribusiness firms are slim. In response to this scenario, farmers at the Massey and the Lincoln workshops both designed corporate-owned larger farms, with high stocking rates and low costs of production. Both farmer groups expected continued increases in milk production per cow. They also expected genetically modified species in pasture-based systems to improve drought resistance and nutrient-use efficiency.

Both Massey and Lincoln farmers relied on the availability of new technologies to improve farming efficiency. Managers on their farms would be highly skilled in farm management and new technology, and would be able to draw on off-farm technical specialists in IT, robotics, HR, compliance and PR. Semi-skilled labour was expected to be sourced by immigration, and working conditions included a 40-hour week. The Massey farmers expected the introduction of fully irrigated farm systems with on-farm water storage. The Lincoln farmers expected the cows in their system to be selected for beef as well as milk production.
Regulation Rules

By 2025 world trade has continued to expand, facilitated by multi-lateral trade agreements. There has been high economic growth world-wide and an expanding middle-class in developing countries. However, there is more stringent regulation and greater monitoring of supply chains with a focus on food safety, the environment, animal welfare and labour relations.

In response to this scenario, the farmers at Massey and Lincoln thought that a number of business structures would be possible including corporate and family farms. They expected farms to have reduced stocking rates and increased costs from the addition of farm monitoring and data-collection. Highly skilled managers, with access to technical specialists were required for these farms. Working conditions were expected to have been improved and all farm staff would be working a 40-hour week. Farmers expected these farms to have considerable technology to automate monitoring and provide proof of process. They would need to have a high level of transparency, full traceability and full third-party auditing.

Massey farmers considered that under this scenario dairying would be restricted to only a few regions in New Zealand where the environmental impact would be relatively low. They expected the industry to have seasonal calving, whereas the Lincoln farmers expected calving to be all-year-round. Both farmer groups expected cows to be in good condition all year round, meeting high animal health and welfare standards. All calves would be reared as either herd replacements or sold on for beef production. Both Massey and Lincoln farmers expected the farming systems to be grass-based with increased dry matter production from forage crops, grain crops and maize silage. Massey farmers expected there to be widespread introduction of irrigation in their region.

Conclusion

This study found considerable similarity between the expectations of farmers in the Manawatū and Canterbury regions for the farm systems under the GD scenario. This similarity may reflect that when governments intervene in market supply networks and production systems, farmers consider that their future options for innovation will be particularly constrained.

The similarities between the regions was less for the RR and CK scenarios, and the greatest differences were when consumer expectations were the most diverse (in the CK scenario). Industry, research and policy organisations supporting the adaptation of dairy farm systems through to 2025 will need to take into account the diversity of farm systems responding to the different drivers described in these scenarios. Depending on the drivers and the regions involved, there may be growing diversity in farm systems between regions.

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References


