DAIRY BUSINESSES FOR FUTURE CLIMATES

MID-NORTH COAST NEW SOUTH WALES

KEY FINDINGS

Options to manage climate impacts in 2040 were analysed for a case study farm on mid-north coast of NSW.

The feedbase (mix of temperate and tropical pastures and crops), was quite resilient to the changed climate.

Heat stress on cows will be a key issue in the 2040 climate for this farming region.

Milk production was predicted to decline by 3-4% by 2040.

If no changes are made to the case study farm, annual operating profit is predicted to decrease by about 20% under 2040 climate.

None of the development options analysed were clearly superior to the others. All have positive and negative features.

Profitability of all options analysed were negatively affected by the 2040 climate change scenarios.

The Adapt option (shade and feedpad) enables better heat stress management in 2040 with moderate capital investment.

Dairy farm managers will need to continue to adapt their farm systems to manage risks.

Aim of the case study research

To explore how dairy farm systems in the mid-north coast region of New South Wales (near Kempsey) might perform under predicted climate changes (out to 2040) and how they could adapt to a changing climate.

A dairy farm near Kempsey was selected as a case study farm, supported by a reference group of farmers and service providers. Three development options for the base farm (case study farm) were modelled in a 2040 climate by an economist and biophysical modellers.

Changes in 2040

- Temperatures will increase by 1.0°C (from 1990-2009 base period).
- Heat stress is predicted to increase in 2040, and milk production to decline by 3-4% for the base farm.
- Predicted to be little change in total annual rainfall but with a 5% decline in winter, 10% increase in autumn and little change to summer rainfall.
- Fewer, larger rainfall events are expected, with longer dry spells in between.
- Pasture feedbase is quite resilient to the predicted climate changes in 2040 (and more so than in southern Australia where climate change is predicted to lead to a contraction of the pasture growing season, lower pasture production and grazed intake).
- Monthly average pasture growth rates were predicted to increase in autumn and winter but decline slightly in late spring.

Base farm:
• 230 milking cows • Year-round calving (except summer months) • Grain feeding 2 t/cow per year • Production of 535 kg milk solids/cow per year • Feedbase mix of temperate and tropical pastures and crops.

Three development options explored:

Option 1: Feedlot	Option 2: Adapt	Option 3: Simplify
• 300 milking cows with an increase in milk solids/cow • Freestall barn, no grazing • Invest in a barn, effluent system and machinery • Year-round calving • 3 t concentrate/cow per year.	• 230 milking cows (same as base farm) • Shade infrastructure and concrete feedpad • Cover yard at the dairy • Increase cow intake, production per cow and less wastage • Keep feedbase and operating costs similar.	• Decrease to 180 milking cows • No capital investment in infrastructure • Split calving pattern to 66% in autumn and 33% in spring • 1 t concentrate/cow per year • Feedbase changed to more perennial pasture to fit calving pattern.

What differences did we find between the options?

The predicted profitability of the base dairy farm business and all three development options was lower than current under the 2040 climate change scenarios modelled.

None of the development options analysed were clearly superior to the others. All options have positive and negative features and the profitability of all are sensitive to milk price. The Adapt option appears to enable better heat stress management in the predicted 2040 climate without such substantial capital investment as the Feedlot option. The most suitable option will depend on resources available to the business and the long-term plans and goals of the people involved.

In the Base farm and Simplify option, where no additional infrastructure was provided, milk production was predicted to decline by 3-4%. But for the Adapt and Feedlot options, with shade infrastructure, the reductions in milk production were predicted to be 1% and 1.5% respectively, with the high-producing feedlot-cows being more susceptible to heat stress.

Feedlot option

- Higher variability in profit/risk than the other options and predicted profit would not justify the additional risk if the average milk price was $8.00/kg milk solids or less.
- Higher exposure to supplementary feed prices means this option is impacted by dry periods (with high imported feed prices).
- A high and stable milk price makes this option a more attractive investment.
- Obtaining planning approval for a feedlot is likely to be difficult in this location.
- Higher initial equity is important for this option.

Adapt option

- The Adapt option was least impacted by 2040 climate due to better infrastructure to manage heat stress with lower capital investment than the Feedlot option.
- Reasonable strategy to mitigate heat stress with moderate capital investment.
- Little difference between the profitability of the Base Farm and the Adapt option in the Historic climate.

Simplify option

- While the % return is comparable to the Base Farm, the annual operating profit is smaller which would impact on ability to service debt and grow the business.
- Other risks are reduced.
- Performs relatively well in dry periods with high supplementary feed prices due to lower exposure to the supplementary feed market.

This case study provides some indicative data for the region, but care needs to be taken about making regional generalisations from individual case study farms. For this region, most of the impact stems from increased heat stress impacting milk production. Other regions around Australia, where case studies have been conducted, are more affected by reduced pasture/crop production.

Successful implementation of all options will be heavily dependent on excellent management skills.

In addition to 2040 climate impacts, 'one-off' events such as a large flood or bushfire can be very costly to farm businesses but are difficult to represent in the modelling and should be considered where possible in future planning decisions.

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