

Crossbreeding in Australian dairy herds

Crossbreeding is a strategy to improve fertility in Australian dairy herds.

Many farmers are unsure where to go after the first cross, and if it is overall a profitable strategy.

The research

In 2015, Dairy Australia funded a two-year research project which looked at:

Farmers' attitudes towards crossbreeding

How many farmers were crossbreeding, including those using a 3-breed rotational system

Data on production, cell count, reproduction and survival, which were used to answer the questions:

Where should we go after the first cross? and

Does a backcross or a 3-breed strategy perform better?

An economic model to compare the performance of a purebred herd with a 2-breed or 3-breed crossbreeding herd.



Farmer's thoughts on crossbred cows

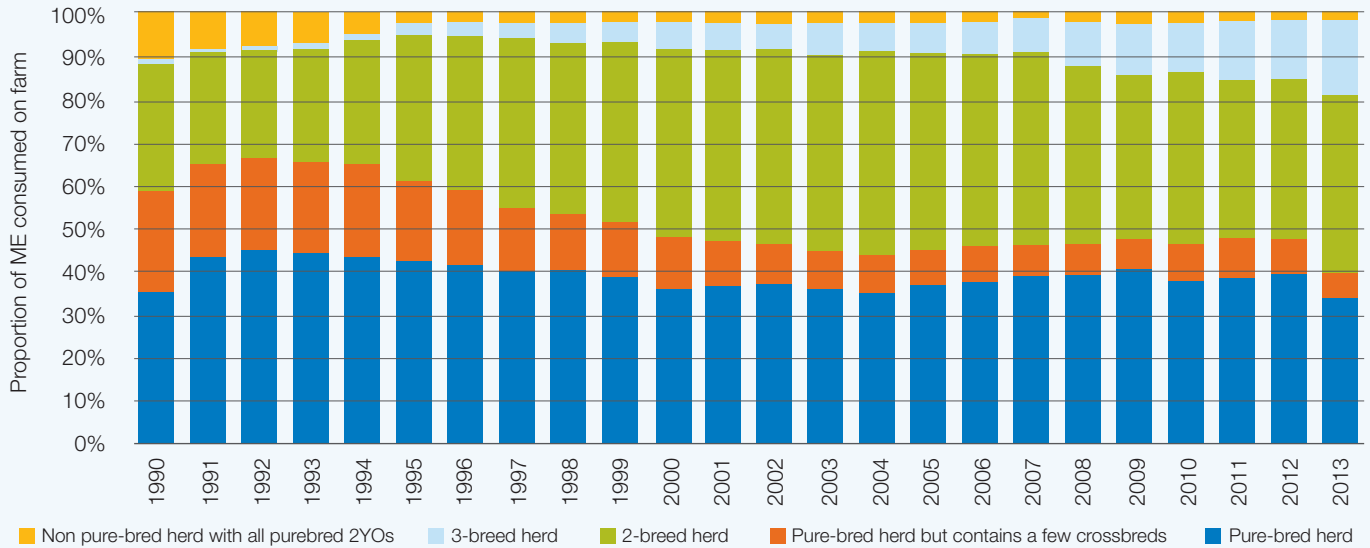
This study interviewed 94 farmers on their attitudes towards crossbreeding.



There are more crossbred than purebred herds, and many farmers are considering the switch.

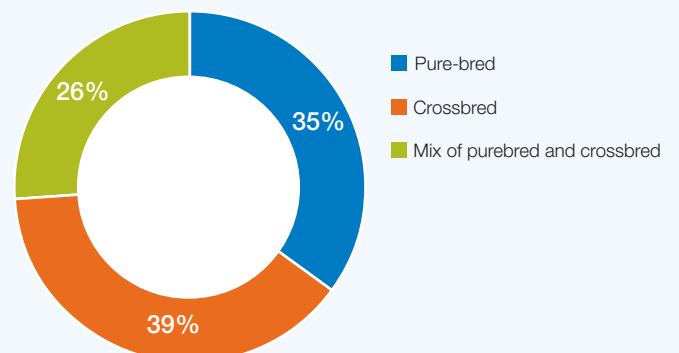
Crossbreeding in Australia

Figure 1 Changes in herd-bred structure in Australian dairy herds from 1990 to 2013



Breed structure of Australian herds

“Younger farmers are more likely to have a crossbred herd than older farmers.”



Performance, longevity and fertility of crossbred cows

The analysis of crossbred cows' performance in this study was a world first. Previous comparisons had only focused on the first cross, and no one has compared a backcross (to one of the parent breeds) with a 3-breed cross.

The first part of the study made comparisons between the F1 (first) cross and the purebred parent breeds. The second section of the study made comparisons of the next generation, between backcross and 3-breed combinations.

Table 1 Comparisons of crossbred cow performance based on industry data analysis

- ▲ Significant positive difference in the breed comparisons
- ▼ Significant negative difference in the breed comparisons
- No significant difference in the breed comparisons

		First generation crossbred cows J x HF cross compared to J or HF parent breed	Second generation crossbred cows* 3-breed cross compared to backcross (J x J-HF or HF x J-HF)
Production	Milk	▼	▲
	Protein	▼	▲
	Fat	▲	▲
	Protein %	▲	—
	Fat %	▲	—
Survival		▲	▲
Fertility	3 week submission rate	▲	—
	Conception rate	—	▲
	6-week in-calf rate	—	▲
Cell count		—	—

* Results for the most common 3-breed cross (Australian Red x J-HF) are shown. When the order of the 3-breed combination was changed eg. J x HF-Red, in most cases the 3-breed cross still outperformed the backcross cow.

2-breed crossbred cows

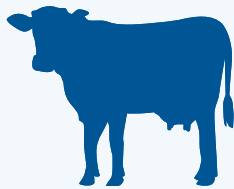
- › 2-breed (J-HF) crossbred cows perform better than the purebred cows for components (fat, protein per cent and fat per cent) but worse for milk volume and protein.
- › The 2-breed animals also survived longer and got in calf quicker than the purebreds.

3-breed cross breeding

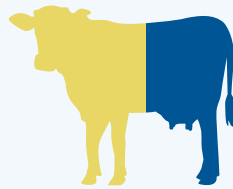
- › The Aus-Red x Jersey/HF 3-breed cross outperformed the backcross (HF x J/HF or Jersey x J/HF) for almost all aspects.
- › The order of 3-breed cross breeding may not matter.

What are the economics of crossbred herds?

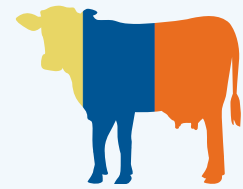
An economic model used in the ‘Improving Herds’ project (to examine the impact of selection strategies on farm profitability) was adapted to examine crossbreeding as a strategy. Three scenarios were compared over a ten-year period:



1. The persistence of a pure breed herd



2. Crossbreeding to a 2-breed herd

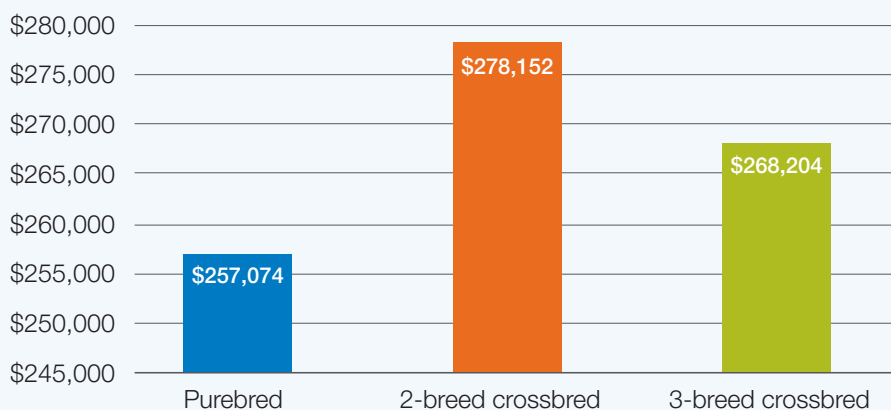


3. Crossbreeding to a 3-breed herd

Overall the findings were:

- › Crossbreeding was consistently more profitable than persisting with a purebred herd in the pasture-based seasonally calving farms.
- › Gross margin improvements of between 4–8% per annum is predicted within a ten-year horizon (see Figure 2).
- › Crossbreeding needs to be implemented for **up to 6 years** before differences between the strategies in farm profitability and performance become apparent.
- › A small **reduction** in milk production and profitability in the first few years of converting to a crossbreeding strategy. When the bulk of the milking herd remains purebred and when the first few cohorts of crossbred replacements are smaller and less productive.
- › A crossbreeding strategy may require an **increase in stocking rate** to ensure that farm pasture consumption is maintained as cow size and cow production decreases with the conversion from purebred to crossbred cows. This is the key to ensuring total farm milk production and profit is maintained through the transition from purebred to crossbred cows.
- › Improved **herd reproductive performance** is the major driver of improved profitability. Cows that live longer have more lactations. Fewer replacements are needed each year and these savings directly convert into extra profit.
- › Supplementary feeding provides a gearing opportunity for well-managed crossbred herds. Careful evaluation of milk-to-grain prices and the expected marginal milk response to the feeding of additional grain is required – but this is the case for all grazing systems.

Figure 2 Modelling annual gross margin in purebred and crossbred herds



“Crossbreeding was consistently more profitable than persisting with a purebred herd”

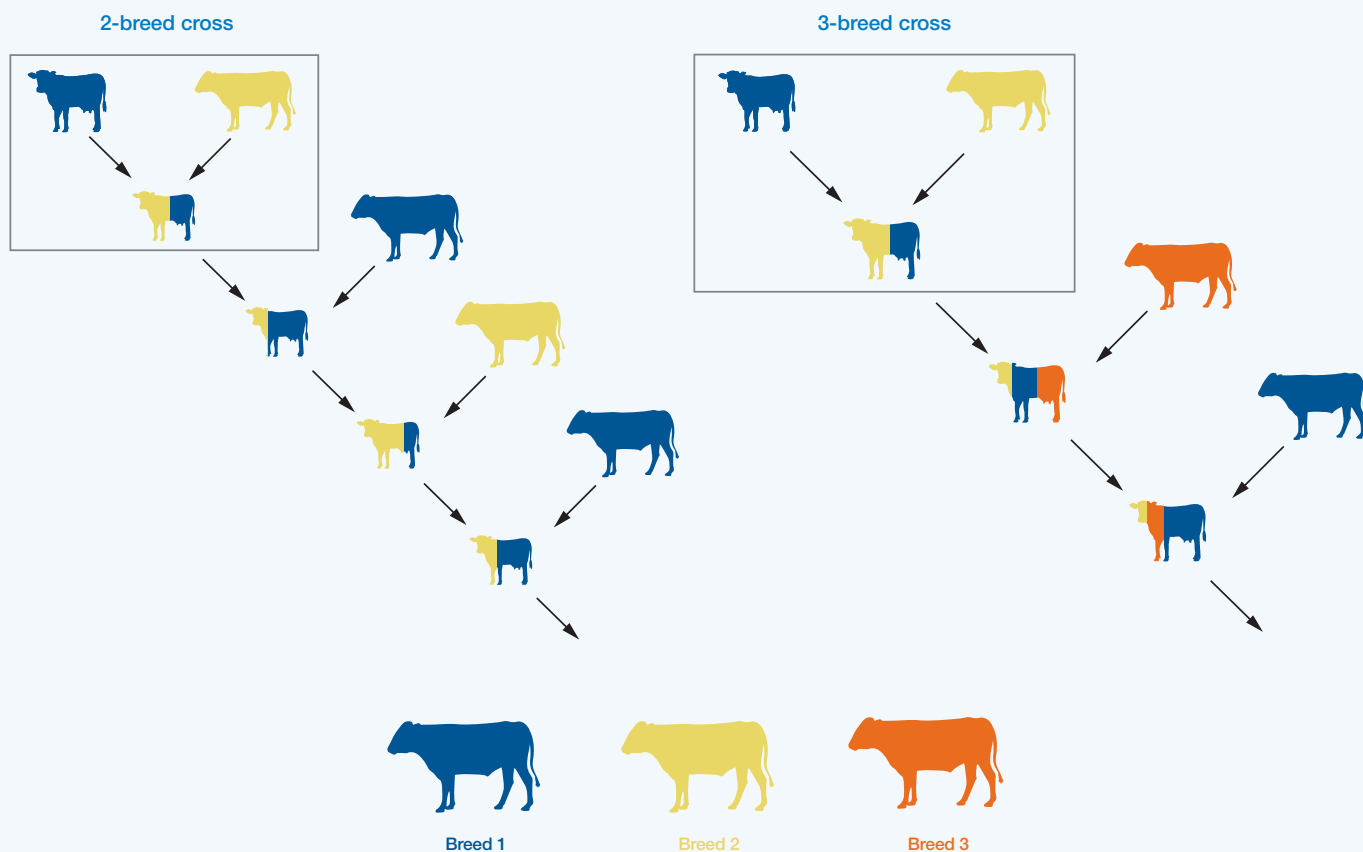
Crossbreeding is a profitable long-term strategy.

Crossbred cows tend to be more fertile, survive longer and produce higher percentage milk components than purebred cows.

To see the benefits, you must use high genetic merit bulls (+100 BPI from the Good Bulls Guide).



Crossbreeding strategies for your herd



Crossbreeding strategies for your herd

For more information on crossbreeding, see dairyaustralia.com.au/incalf:

Dr. Jo Coombe study on crossbreeding, published in the InCalf Symposium 2017 Proceedings

The InCalf webinar *Crossbreeding in Australian Dairy Industry* aired March 2018

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