

Crossbreeding in dairy herds

Findings from the “Sustainable dairy farm systems for profit” project

M5 Project Information Series - Studies on Mutdapilly Research Station and subtropical dairy farms 2001 to 2005

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Information updated February 2006

Overview

FINDINGS from Australia and overseas indicate that the average 200-cow northern NSW and southeast Queensland dairy farm could expect a 3 cent per litre price advantage from a Holstein Friesian/Jersey cross herd compared with a straight Holstein Friesian herd, under current payment systems.

Before considering any breeding change, weigh up the current information for your farming and milk pricing systems.

Consider all factors – including the cost of changes to facilities that may be required to handle a mixed-size or smaller-sized herd.

Also factor in the value of surplus stock – which account for 9% of dairy farm income (3.5 cents per litre on 2004/05 QDAS figures).

Industry background

CROSSBREEDING is being considered by Australia’s subtropical dairy farmers for a variety of reasons.

One of the most basic reasons is: If pasture-based cows are being fed to produce 7,000 litres in the subtropics, is it economical to breed 10,000 litre cows that won’t be fed to their genetic potential?

If the object is to convert grass into milk solids, crossbreds, compared with straight Holstein Friesians, appear to offer farmers in the region potential for equal production of milk solids per hectare, improved reproduction, fewer calving problems, reduced somatic cell count, smaller size, increased survival (number of years in the herd), and the flexibility of breeding cows suited to individual farming conditions. The potential of

crossbreeding to reduce the impact of tropical parasites including ticks and buffalo fly is also being considered by the northern dairy industry.

Crossbreeding does not lead to genetic improvement; that will occur with continued use of selected AI proven sires. Crossbreeding produces hybrid vigour on top of the gains made from genetic improvement.

Lessons from the M5 farming systems project

THE M5 farmlets did not set out to look at the potential role of crossbreeding on the region’s dairy farms. However, because of the growing interest in crossbreeding, and because of reproduction difficulties over summer, crossbred cows were introduced into one of the farmlets in the last year of the project. Comment was also sought from the experiences of M5 project companion farmers.



PHOTO 1. SOME of the M1 raingrown pastures farmlet herd in 2004/05 were crossbred cows. In December 2004 two of the cows were (left) “55” a Jersey X, weighing 410 kg and producing 23.3 L at 4.73 % BF and 3.35 % protein; and (right) “608” a Brown Swiss X, weighing 610 kg, and producing 31.2 L at 3.49 % BF and 3.16 % protein.

Mutdapilly M5 farmlet herds

Milk production figures from the crossbred and Holstein-Friesian (HF) cows in the M1 Farmlet herd – the raingrown tropical-pasture system commonly used in Queensland and northern NSW. herd – are presented in *Table 1*.

TABLE 1. CROSSBRED vs. HF cows in the M1 farmlet.

Breed	L/day	L/yr	Milk fat	Protein	LW kg
HF	22.7	6,354	4.14 % 263 kg	3.24 % 206 kg	557
X bred	20.8	5,833	4.44 % 259 kg	3.27 % 191 kg	495

Reproductive data from this showed crossbreds performed better in first-service conception rate, 44% vs. 29%, but HF cows obtained better results in second and other-service conception rates. The small number of animals meant that any differences were not statistically significant.

M5 companion farmer experiences

(Information collected November 2004)

Peter Rohan

Kerry, southeast Queensland

Running a Holstein Friesian herd, the Rohan's introduced a Jersey bull to use over heifers to overcome calving problems, including loss of heifers. Seeking to expand the herd without buying stock in, the family aims to rear as many calves as possible. Peter Rohan: *"It's great to see a HF/Jersey heifer on the ground and alive."*

They are impressed with their first-cross heifers, describing them as *"good honest little cows"* that are in good condition, settle in well, and compete well for feed. Bred from a stud Jersey bull for quality genetics, the crossbreds will be mated back to a HF bull. Peter Rohan: *"All farms are trialling things all the time. In five years we could be doing something very different."*

Paul Newland

Malanda, north Queensland.

The Newland's bought a dairy farm with a mixed herd. Early on they decided to base the herd on quality genetics, so bought some high priced/high quality Holstein Friesian cows. Existing Jerseys were kept in the herd to maintain protein; however

they were unable to produce both high milk volume and high quality. They also found, at the time, that Jersey cows lacked resale value, irrespective of their breeding lines. Compared with HF, they have found calves of other breeds more temperamental and difficult to rear. The Newland's decided to move to a purebred stud HF herd, with the backing of a global genetic pool.

Paul Newland: *"Crossbreeding doesn't automatically bring an improved test. There are HF bulls available if you want to correct composition problems or to breed for calving ease, feet and legs or to correct udder shape. It's important to define what you mean by crossbreeding. I also wonder about how to sustain a true crossbred herd over time."*

Jason Bake

Coffs Harbour, north coast NSW

The Bake family farm had a history of crossbreeding – when converting from a Jersey to Holstein Friesian herd. Jason Bake recalls a *"really good first cross"*, but at that time the family kept moving towards a HF herd.

In recent years, Jason began mating HF to Jersey bulls, and bottom-end crossbred Jerseys back to HF bulls to produce an even line of black cows.

He believes there are gains to be had in crossbreeding and heterosis: *"I believe we can get what we want in a cow more from crossbreeding than from selecting within a breed. The aim is still to breed quality cows. Ours are all commercial cows, but we still use the best genetics, no matter which breed bull is being used."*

Recently the family has incorporated Scandinavian Reds for their long history of selection for udder health and fertility. Top HF bulls are used over Scandinavian Red/Jersey cows for udders, milk flow, and temperament. In the last few years they have used *"any breed we can get our hands on to get the cow we want"* – including a few Brown Swiss, Guernsey, Illawarra and Ayrshire.

"There will come a time when it gets too involved, so we're likely to end up choosing one breed of bull to use each year – Red, HF, Jersey – and select carefully within the breed for the year."

At that time they intended to retain half the herd as purebred Jersey, the rest as three-way cross cows.

Other Australian crossbreeding studies

A RECENT study of 17,000 Holstein Friesian x Jersey crosses from AI matings in Victoria compared the crossbred's performance with Holstein Friesian averages.

Table 2. Victorian production comparison

Breed	Litres	Milk fat	Protein
HF x J	5,844	4.5 % 253 kg	3.5 % 201 kg
HF	6,500	3.9 % 251 kg	3.2 % 211 kg

Because the crossbreds tended to be smaller than the HF, farmers ran 10% more crossbred cows, resulting in higher milk solids/ha for crossbreds.

The crossbred milk also averaged a lower somatic cell count.

The 6-week in calf rate was 70% for crossbreds and 60% for HF. That advantage was maintained through a 12-week mating period for all age groups.

Analysing ADHIS data, Mick Carrick, Victorian Department of Primary Industries and Professor Mike Goddard concluded that straight HF were more profitable than other straight breeds, and that the HF x Jersey first cross was more profitable than straight HF.

Surveyed Australian farmers who favoured HF gave higher production, larger size, good sale value and temperament as their reasons.

Disadvantages of HF, listed by surveyed farmers included size, cost to feed, lower components and fertility.

HF x Jersey (the cross most Australian farmers have experience with) were favoured for their higher components, smaller size, hybrid vigour and improved fertility. Disadvantages listed by surveyed farmers included their lower sale value, smaller size, and lower milk production.

Likely income difference

Assuming the 10% increase in stocking rates for HF x J cows found in the Victorian study, and applying Nth NSW and SE Qld payment rates to the production and composition of that study, the crossbred herd would net \$30,000 more in milk payments for a 220 cow herd compared with a 200 cow HF herd.

The four processors in this region have different payment systems, but the average difference (excluding PDA milk) in returns for milk in the study would be 3cpl in favour of the HF x J herds. Some payment systems also have substantial penalties for failure to comply with minimal composition, which would further advantage the crossbred herds.

Problems with crossbred herds

Some farmers mention difficulties handling small cows or heifers in the herd. Laneway, holding yard size and dairy design could overcome these concerns. Any milking system with individual spaces for cows – such as rotaries, rapid exit, standard herringbone with stall gates, and walkthroughs will minimise the difficulties. Small cows will still have room to move in a stall made for a large HF, but larger cows will not be able to push them around.

USA major crossbreeding study

IN a recent visit to Australia, USA geneticist Les Hansen from the University of Minnesota explained what had led to increased interest in crossbreeding in Holstein Friesian herds in the US – declining fertility, increased health problems, cows calving fewer times and having a shorter life in the herd.

He explained that globally, HF (and similarly Jerseys in US) were becoming more closely related. The depressing effect of inbreeding is greatest on fertility, health and survival.

These concerns led to a trial on seven large Californian dairy farms, crossing European and Scandinavian breeds over HF to compare the first crosses with straight HF. There were 1,400 cow and 130 sire records analysed in the trial.

Scandinavian Reds, Monbeliarde and Normande breeds were selected for crossing with HF, because of US industry's focus on milk volume.

Overall, HF averaged more milk and total solids than crossbreds, but ease of calving, survival and fertility all favoured the crossbreds – which would have compensated for the difference in milk production to a large extent.

What type of breeding program?

THERE seem to be several options for a predominately HF herd.

1. Don't crossbreed, but select sires with the traits desired from within the HF breed.
2. If you want to improve composition keep a second breed of cows in the herd, but as purebreds also.
3. Mate HF heifers to a Jersey or other breed, mate X bred heifers to HF. Only have 1st or later cross animals in the milking herd and mate them to HF.
4. Mate heifers and cows on what they look like or their milk composition i.e. mate large animals to a smaller breed sire, or mate low fat/protein % cows to a higher composition breed sire.
5. Run a continuous crossbreeding system that makes use of three breeds. Some farmers are already having good results with Aussie or Scandinavian Reds over Holstein Friesian x Jersey first crosses.
6. Use crossbred bulls. AI-proven crossbred dairy bulls are available internationally and are already being used by Australian and New Zealand dairy farmers.

Photo 2. Holstein Friesian, Jersey and Brown Swiss crossbred heifers from the Mutdapilly herd.



The *Sustainable dairy farm systems for profit* project at Mutdapilly Research Station and on associated commercial farms investigated the potential impact of intensification of five subtropical dairy farming systems on business productivity, on the social well being of farming families and on the farm environment.

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Conclusion

PROFIT is the main focus of any breeding program. One advantage of crossbreeding is that it allows farmers to increase the rate of improvement of important, lowly-heritable traits such as fertility, health and survival. Successful crossbreeding will always depend on a source of good purebred stock. Genetic improvement in the Australian dairy herd will therefore continue to rely on finding and using the best-performing bulls of all breeds under Australian conditions – evaluated by the ABV system.

The sale of surplus stock – including bull calves – accounts for nine percent of total farm income (3.5 cpl), so this needs to be considered in any plans to crossbreed or to change breed.

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