

Managing a three-way crossbreeding strategy in a large herd

CASE STUDY 05 RUTH & NEVILLE KYDD, FINLEY, NEW SOUTH WALES

Ruth and Neville Kydd have a three-way crossbreeding dairy herd at Finley. In an area where feed-pads are common, the Kydds use a pasture-based feeding system where all silage is fed in the paddock. They milk 1300 cows on an effective milking area of approximately 430 hectares.

The property is 1192 hectares in total, so depending on irrigation water availability, the size of the milking platform may change. Although their system is pasture-based and has a single seasonal calving, their crossbreed cows still achieve an average of 530kg milk solids per cow per year.

Table 1 Farm Description

Operating arrangement	Owner
Business Phase	Growth
Effective milking area	430 hectares
Cow numbers	1300
Breed	Three-way crossbreds (FF, AA, JJ with some Norwegian Red)
Feeding system	Grain at milking time
Production	18–20 L per cow per day
Calving pattern	Seasonal
Joining length	11 weeks
Empty rate	5.5%

Why crossbreed?

Ruth and Neville have not always milked crossbred cows; originally, their herd was all Holstein-Friesian. However, Ruth became concerned about inbreeding within their purebred herd and consequently was spending a large amount of time matching semen choices for their cows. Even though this was back in the early 1990's, Ruth and Neville were also unsatisfied with their reproductive performance as they were consistently achieving a 20 per cent empty rate, despite a very long mating period. In 1992, Ruth and Neville made the decision to start inseminating their Holstein-Friesian heifers using Jersey semen.

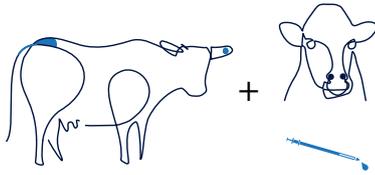
They are scrupulous in keeping accurate herd records. In 1995 when the Jersey-Friesian heifers had entered the milking herd, their records indicated that they were getting in calf much easier and appeared as though they were producing as well as the purebred Holstein-Friesian heifers. This gave Ruth and Neville the confidence to start cross-breeding their whole herd with Jersey semen. There was, however, always a dilemma as what breed of sire to use on the 1st generation of crossbreds. This decision was made easier in 2006 when Ruth and Neville started using a three-way crossbreeding strategy.

A simple approach to three-way crossbreeding

Ruth and Neville have adopted a visual cow identification system. With only a glimpse of the cow or herd ID system, they instantly know the breed of the sire of the cow and the breed to which she will be mated. Ear tags, tail paint, markers within their AI tank, and even cow numbers on their computer program are all colour coded. Their AI technician is also on board with their ID system as he too has colour coded his AI guns.

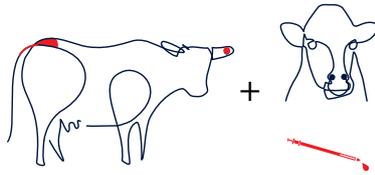
Figure 1 Kydd's colour coded three-way crossbreeding system

Female with Friesian sire identified by a blue ear tag and with blue tail paint



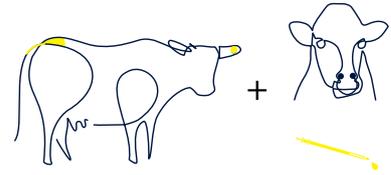
Mated to Ayrshire semen using a blue AI gun

Female with Ayrshire sire identified by a red ear tag and with red tail paint



Mated to Jersey semen using a red AI gun

Female with Jersey sire identified by a yellow ear tag and with yellow tail paint



Mated to Friesian semen using a yellow AI gun

For instance, a cow with an Ayrshire sire will have an ear tag with the sire breed written on it. The back of the ear tag will be red and the cow's number will also come up as red on their herd data system ('Identity'). At mating time the cow will be painted red, and the Jersey semen which will be used on the cows with an Ayrshire sire will be identified with a red marker in the AI tank. At mating time, the Kydds don't talk about breeds - they only talk colours.

To simplify their mating system even further, the Kydds only choose one sire for each of the three breeds each year (that is, each year they only have one Holstein-Friesian sire, one Jersey sire and one Ayrshire sire). To offset the risk of using only a small number of sires, the Kydds ensure that the sires chosen have highly reliable data for the characteristics that they are most interested in, especially daughter fertility.

Figure 2 Screen shot of colour coded herd software program

Cups ON 5818 FF			
Bail	CowID	Run	Message
>>	21 5636	381	FF
	20 5552	380	JJ
	19 5844	379	AA
	18 6196	378	AA
	17 4842	377	JJ
	16 5995	376	AA
Cups OFF			
Bail	CowID	Run	Message
	29 5544	339	JJ
	28 5893	338	AA
	27 6116	337	AA
	26 5609	336	FF
	25 5520	335	JJ
	24 5144	334	FF

F1= MENU | F2=SEARCH | F4=COW MAINT | GRAFT: F3=Left, F5

Breeding for fertility

The Kydds' herd has exceptional reproductive performance. This is the result of years of selective breeding by the Kydds for high reproductive performance combined with the benefits of heterosis (hybrid vigour). Heterosis is the reason why the fertility of crossbred cattle is generally superior to the fertility of their purebred parents. However, the Kydds have not simply relied on heterosis to improve their herd's fertility. When they select their AI sires, they heavily weight their sire selections for high daughter fertility ABV.

Mating management

The AI period for the milking cows in the Kydds' herd is only 14 days. Three weeks before mating start date, all cows receive a prostaglandin injection. Once mating commences, the Kydds AI cows with detected heats. Any cow not joined by the end of the first week is given another injection of prostaglandin. By the end of the 14 days of AI mating, the Kydds will submit 90 per cent of their cows and achieve a 70 per cent conception rate. Jersey bulls are then run with the herd for nine weeks with 15 bulls in the herd during the day and another 15 during the night. Although only AI calves are reared as replacements, the Kydds rear 35 Jersey bull calves out of the heifers each year as future mop up bulls to minimise calving issues in the naturally bred cows. The mating program has led to the Kydds achieving an empty rate of 4.5 to 5.5 per cent for several years.

Given their large herd size, Ruth no longer believes that heat detection using paddock checks for visual signs of oestrus is a practical option. She simply cannot deal with the large number of cattle on heat at any one time. For over 10 years, all heat detection has been undertaken in the dairy. The Kydds have some rules to maximise the number of cows detected that are on heat. Firstly, the same person does all of the heat detection for the two-week joining period. Secondly, tail paint and Kamars are used simultaneously. Ruth is adamant that this is of crucial importance in their system. She has observed that a cow on heat will often trigger only one of the heat detection aids, so it is much safer to use two methods.

Figure 3 Simultaneous heat detection aids



Despite the exceptional reproductive performance within the milking herd, the Kydds continue to undertake a fixed-time AI program for their maiden heifers. Heifers are mated to commence calving approximately two weeks before the milkers, to ensure that they have time to recover from calving by the next joining period. Currently they use Jersey, Ayrshire and Norwegian Red easy calving sires but not Holstein-Friesian sires to join the heifers. Although many farmers find this strategy successful, the Kydds choose smaller sires as they want to maximise the chance of their heifers getting back in calf quickly.

Figure 4 Colour coded painting of cows at mating time



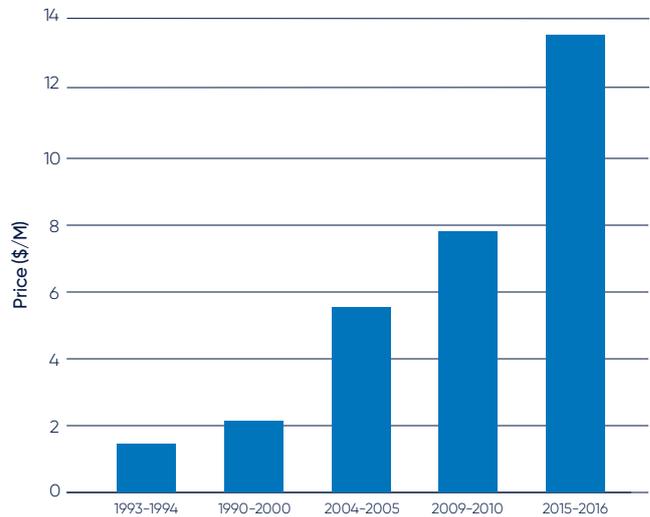
Using evidence to drive change in practices

Ruth isn't just remarkable at keeping records; she actively uses herd data to drive change on the farm. She aims to make the business not only more efficient, but also easier to operate. Examples of this approach include changes in their synchrony program for their cows and their heifers, changes in their semen handling technique, changes in their heat detection strategy, and even changes in their breeding strategy. The Kydds should be commended for striving to continually improve their management practices. Their meticulous herd records give them the evidence and confidence to make the necessary changes.

Why it works

This case study shows that it is feasible to operate a profitable three-way crossbreeding system, even on a farm with a large herd size. Implementing a simple, visual system ensures that three-way crossbreeding takes place with ease, achieving consistently outstanding results.

Figure 5 Growth in net worth of the Kydd enterprise



The Kydds have achieved exceptional growth in the net worth of their farm since commencing cross breeding in the early 1990s whilst only experiencing three years of negative profit over the same time period.