

FARM AND HERD PERFORMANCE - THE U'S DRIVE IT!

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Efficient herd reproduction is central to profitable farm business.

It's worth big money, \$52,000 per annum in profit for an 800 cow dairy farm lifting 6 week in-calf rate by 10% and dropping empty rate by 2.5%, according to the Dairy NZ InCalf™ Gap calculator!

And driving a profitable farm business is a top priority for most dairy farmers, so in today's session we will explore how herd reproductive efficiency impacts farm business performance.

The herd is the mechanism by which reproductive benefits are delivered and it largely comes down to the two 'U's' the cow has available to drive herd and farm performance – her uterus and her udder.

This session will focus on getting the best out of both to drive profitability on your farm. We'll cover:

- underlying principles
- what good repro performance delivers on farm, and
- how to measure and monitor performance in your herd.

Principles

Driving farm profitability through the herd

Profitability involves converting the raw material of feed into profit. Like any manufacturer, we need that process to be as efficient as possible.

Your herd of cows is the engine that converts the feed on farm into saleable products to generate profit.

Notes:

Therefore, for profitable and sustainable farming it makes sense to have the most efficient herd possible.

The dairy industry's national breeding objective is to identify sires whose daughters are the most efficient at converting feed into profit.

While the objective remains unchanged, the component traits and relative weightings are adjusted by the industry as needed to deliver sustainable profitable herds. Recent examples include the addition of body condition score as a trait and increased emphasis on fertility traits in breeding worth (BW).

Additional industry research such as the Fertility Trial will feed into our knowledge base and possibly inform future refinements.

Herd improvement principles

Generating the herd you want is driven by four herd improvement fundamentals:

1. the sires you use
2. the cows you cull
3. the calves you rear
4. all of which are enhanced by efficient herd reproduction.

The cow has the ability to generate income in three ways:

1. Milk production (her udder)
2. Progeny generation (her uterus) and finally
3. Sale of the cow (herself).

The first two are repeatable year on year; the last one is terminal.

Hence, as dairy farmers, it is prudent to focus most on the first two!

The uterus, the udder and goals for mating

Getting the most out of the uterus and the udder is inextricably linked. Reproductive efficiency underpins dairy farm business.

The uterus drives the udder by initiating lactation with the birth of a calf.

Early pregnancy → early calf → longer lactation.

The quality of the calf born determines the efficiency of future cows that will be converting feed into profit in your herd.

We want the cow to maximise:

- her lactation length year after year, giving days in milk (DIM)
- her survival in the herd (DIM/ lifetime)
- her efficiency of milk produced per day for the feed available (milk per day)
- the value of the milk produced, and
- the value of her progeny born.

To achieve this she'll need to maximise outputs from both her uterus and her udder.

The uterus

Using the uterus most efficiently maximises the cow's days in milk and the value of her progeny. She'll need to:

- calve early every year to maintain reproductive efficiency and to deliver maximum days in milk
- be of high genetic merit and
- be in calf to the most appropriate sire for generating value.

Mating goals vary between farms and could include generating:

- high genetic merit replacement heifers
- high value feeder calves for sale
- more days in milk from Short Gestation Length (SGL) calves, or
- A2A2 animals for your herd.

So it's important to keep the end in mind when making mating decisions.

The udder

Generating the most profit from an udder depends on the daily outputs of the udder for the feed the cow consumes and the days she is in milk.

An early calving, high genetic merit healthy cow will generate more profit from the feed provided than a later calving, lower genetic merit or unhealthy herd mate.

The more days she is in milk, the more revenue she'll generate and the earlier she calves prior to the subsequent mating, the more time she will have to recover to get back in calf.

Efficient reproduction and lower empty rates provide more choice. With this choice farmers can cull the lower performers and keep the best cows in the herd, driving future efficiency.

Goals for mating: 6-week in-calf rate and empty rate

- Whatever your end goal, an early born calf is always more attractive.

Notes:

- Choice allows you to use culling pressure to populate the production engine room of the herd with early calving highly efficient 4-8 year old cows.

Goals for mating should *always* include maximising your 6 week in-calf rate and minimising empty rate, thereby maximising choice.

Getting there - reproductive sustainability principles

Calving pattern emerges as a common theme for getting the most out of both the uterus and the udder.

It is a key driver of both revenue and reproductive sustainability in seasonal calving herds.

Protecting calving pattern is central to driving milk production and herd fertility.

What to aim for

A tight calving pattern starts with getting cows in calf as early as possible in the mating period every year.

That means meeting submission rate and conception rate targets.

Hitting the 90% 3 week submission rate target should be a key goal on farm.

- 90% submission rate x 60% conception rate = 54% 3 week in-calf rate.
- Maintaining performance through weeks 4-6 of mating is necessary to achieve the industry target of **78% 6 week in-calf rate**.

Reproduction key management areas

The eight key management areas that impact on herd fertility are well described in The InCalf book (DairyNZ), page 5. They are:

- calving pattern
- calf and heifer management
- body condition and nutrition
- heat detection
- non-cyclers
- genetics and AB practices
- service bulls management
- cow health.

A drop in performance in one or more of these key areas can impact herd in-calf rates and empty rates.

Reproduction life phases, management phases and jobs to be done

Cows are in a race against time that starts at birth to:

- calve down early in the herd as two-year-olds
- remain early calving every year thereafter, and
- survive in the herd year on year.

Keeping calving pattern tight starts at birth and carries on through the whole life of the cow. At every stage we need to remember the end goal- the 'job to be done' for that cohort of animals.

To do this you'll need to look after the animal well throughout her life across all the key management areas, namely:

- meet key growth, health, live weight and body condition targets
- accurately detect heats, and
- effectively manage mating every year.

It is helpful to think of the different phases of the animal's life journey from birth and the reproductive outcomes that are required for each phase. Refer Figure 1 below.

This is essential to help ensure she remains an early calver for her whole life, maximising the value delivered from her uterus and udder and helping create the most efficient herd.

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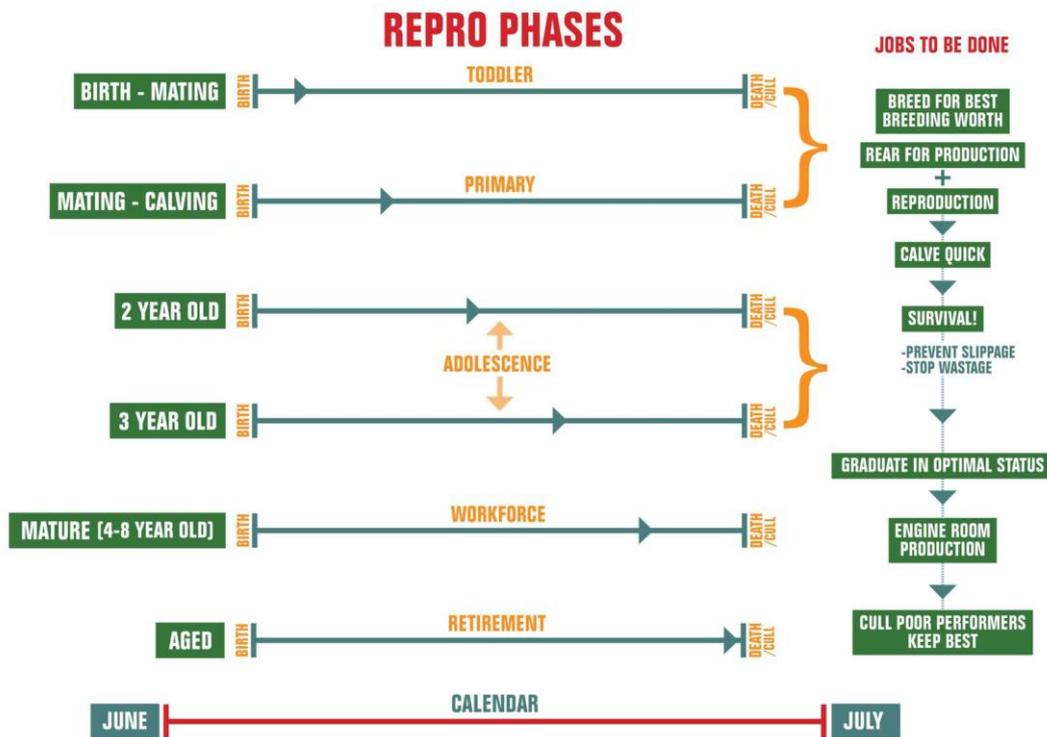


Figure 1. Reproductive life phases

Life phases:

For each reproductive life phase, keep the end goal in mind when you make key decisions as it will impact the lifetime outcome.

From the start we want to breed for the best BW and with this new generation rear them to reach their live weight target milestones. The result will be animals that are set up to maximise lifetime production and reproduction.

At 15 months of age they should be managed so they get in calf quickly and calve down early in the calving period in their first lactation.

At the target live weight and body condition, they'll be set up for better reproductive performance in the hurly burly of life in the herd.

Reproductive management of 2 and 3-year-olds, which are essentially the 'adolescents' of the herd, focuses on:

- retaining an early calving pattern
- minimising wastage.

Reducing wastage and calving pattern slippage allows some early culling pressure to be placed on the herd. High genetic merit, high performing animals should then enter the 4-8 year-old age group (the production engine room of the herd) as early calvers.

These ‘graduates’ should remain as early calving cows in the workforce, efficiently producing profit for the maximum number of days each season, and leaving a legacy of replacement daughters that are genetically superior to themselves.

With good culling pressure, by the time they reach the golden oldies of the herd only the best cows remain, and once again with maximum days in milk from early calving they’ll continue their long contribution to your bottom line.

Management phases:

Through the year, key targets must be met and jobs done to achieve the goal.

Figure 2 defines the key management phases.

Keeping the end in mind in terms of the outcome required and the jobs to be done is central to achieving reproductive success. Top performers ensure the key tasks with each age group year-round are done on time.

Tools for New Zealand farmers

Ahead of the Herd Tools are designed to help you remember the goals and tasks for the many areas you’ll need to cover and are available free of charge on the 6 week challenge website at <http://www.6weeks.co.nz/ahead-of-the-herd>.

DairyNZ has useful resources and information for specific areas on their website www.dairynz.co.nz, including the InCalf book™ which contains more detailed information on management for reproductive success.

Notes:



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Figure 2. Reproductive management phases

Measuring performance:

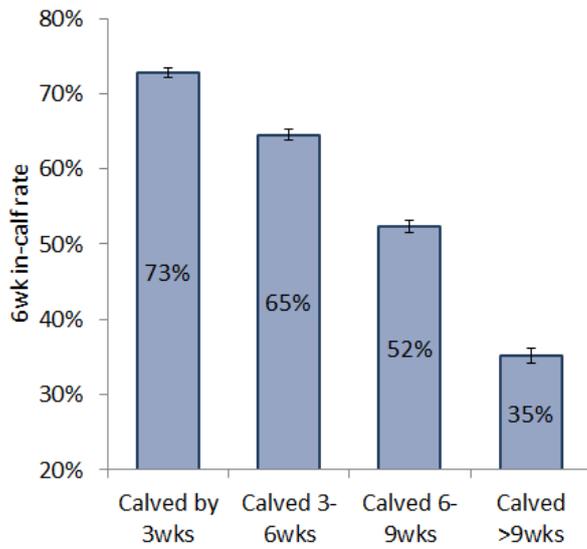
- 6-week in-calf rate
- not-in-calf rate.

6 week in-calf rate and not-in-calf rate are the key outcomes of the mating period to measure.

The two are linked, as with increasing 6-week in-calf rates farmers should see a corresponding drop in not-in-calf rate, for the same mating length. (If you are not experiencing this, then investigate what is happening in the later mating period.)

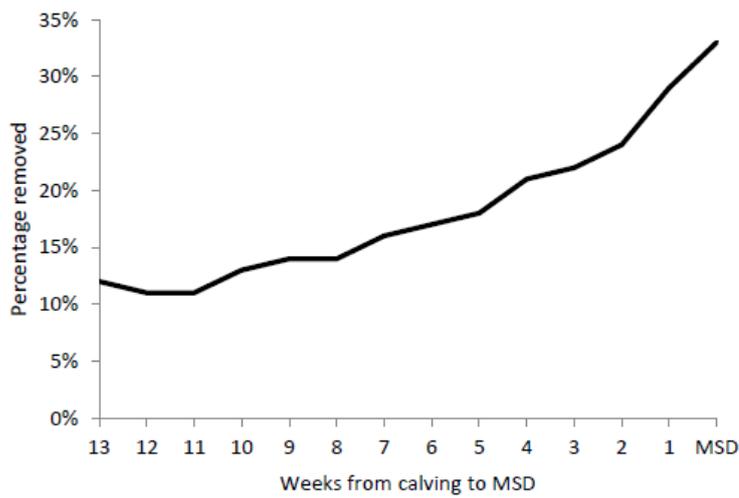
High 6-week in-calf rates deliver days in milk and nice early calves, while reducing calving pattern slippage in herds.

Low not-in-calf rates deliver more choice and less wastage in the herd. See Figures 3 and 4.



Brownlie and McDougall, Cognosco, NHFS

Figure 3. 6-week in-calf rate by calving pattern



Brownlie and McDougall, Cognosco, NHFS

Figure 4: Percentage of cows removed by weeks calved before the next mating start date

Notes:

Calving pattern is fundamentally important to herd reproductive performance.

“If your herd’s reproductive performance is not as high as you would like, the first thing to look for is a spread calving”

(The InCalf book, pg 150)

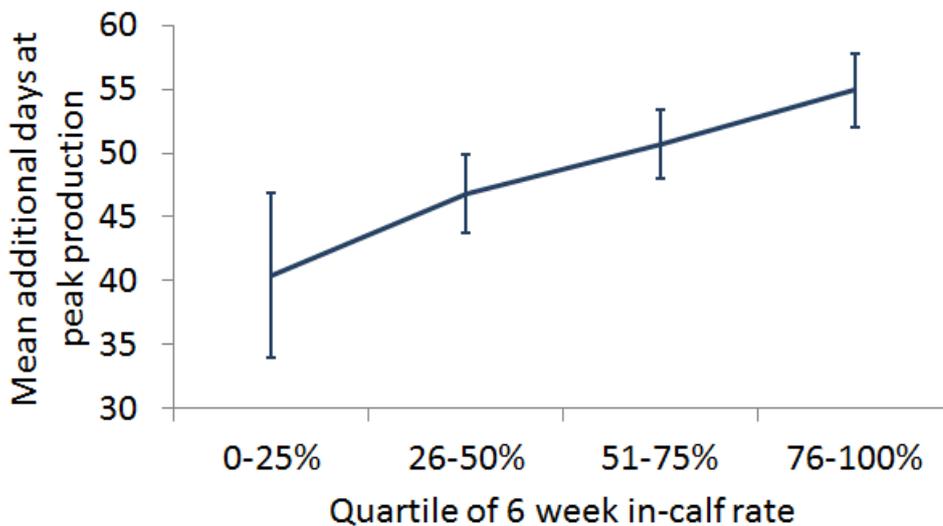
Herds in the National Herd Fertility Study with higher 6 week in-calf rates had more days in milk and more AB replacement calves on average. See Figures 5 & 6 (Brownlie & McDougall, Cognosco 2013).

This was achieved in a shorter total AB period, using less intervention (in farms which did use interventions). Empty rates were significantly lower, as were total mating lengths, on average, in the higher 6 week in-calf rate herds.

This contributes significantly to the farm’s bottom line.

Keeping the maximum percentage of cows calving early in the calving period every year should be a top priority on every dairy farm.

15 more additional days at peak production in the herd



Brownlie and McDougall, Cognosco, NHFS

Figure 5. Additional mean peak production days by quartile of 6 week in-calf rate

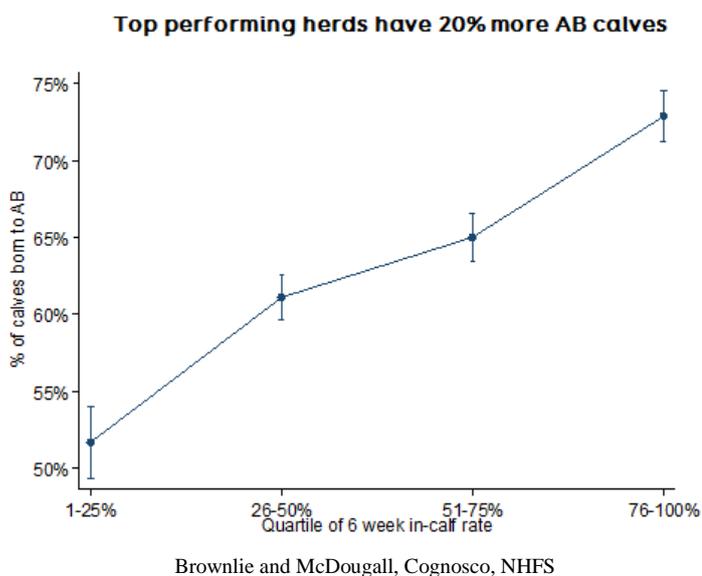


Figure 6. Percentage of calves born to AB by quartile of 6 week in-calf rate

Regional and national performance and trends

LIC interim figures indicate that seasonal calving herds recording on MINDA™ with detailed Fertility Focus Reports™ nationally have held their 6 week in-calf rates in 2015 at just below 67%. Farmers in Southland are slightly ahead of their Canterbury counterparts on both 6 week in-calf rate and not-in-calf rates. See Table 1.

We have seen a further shortening of mating length by approximately 2 days, both regionally and nationally.

This continues the trend towards shorter total mating periods, with a 10 day shortening of average mating length in herds with detailed reports herds from 85 days 2012 to 75 days in 2015. Over the same period we have seen not in-calf rates lift from 14% in 2012 to 17% in 2015.

Notes:

Table 1. LIC Interim National and Regional Average Reproductive Performance (for seasonal herds recording on MINDA, generating detailed Fertility Focus Reports)

Interim only, detailed seasonal reports	National 2015	National 2014	Southland 2015	Canterbury 2015
# of herds included	3699	3523	662	678
6 week in-calf rate	66.5 %	66.8%	66.7%	66.2%
Not-in-calf rate	16.9%		16.5%	17.9%
Mating length	75.5 days	77 days	75.5 days	75.2 days
Submission rate	80.0%	81.1%	79.1%	81.9%
Conception rate	52.4%	52.6%	51.7%	50.5 %

Shorter mating periods have likely contributed in part to the lift in empty rates, but may not explain the full impact.

To reduce empty rate farmers have different options including:

- lift 6 week in-calf rate (expect about a 1% drop in empty rate for every 3-4% lift in 6 week in-calf rate)
- lift performance in the later mating period if that is where the issues exist
- extend mating length (less desirable now that routine inductions are not an option).

You can check out your expected empty rate with your actual 6 week in-calf rate in the bottom of your Fertility Focus report. If it is higher than expected then look at late mating period management.

Be careful to consider potential impacts on empty rates of shortening mating length. Seek professional advice when considering this option, and put plans in place to help achieve desired outcomes.

Table 2 gives a modelled expected impact of shortening mating length on empty rate. It will vary with 6-week in-calf rate.

Table 2. Estimated expected empty rates by 6 week in-calf rate and mating length

6wk ICR rate	Open %	Mating period and expected MT rate								
		7	8	9	10	11	12	13	14	15
40	60	47	36	28	23	19	16	14	12	10
50	50	39	30	23	19	16	13	11	10	8
60	40	31	24	19	15	13	11	9	8	7
70	30	23	18	14	12	10	8	7	6	5
78	22	17	13	10	8	7	6	5	5	5

Adapted from the “Expected empty rate (%), given 6-week in-calf rate and length of mating” table, the InCalf book, page 127.

Monitoring performance in your herd; where to look and what to look for

Herd improvement success is seen in herds where calving pattern slippage is avoided, wastage is minimised and selection pressure has been applied.

Many reports are available to assess herd reproductive performance on MINDA™ reproduction. A few are displayed below. Of particular use are the In-Calf Rate reports generated when sufficient early aged pregnancy testing is entered into MINDA.

- First, look at trends over the years on In-Calf Rates for Whole Herd. Are you gaining ground?

Is calving pattern slippage or cow wastage holding you back?

- Next examine trends during the mating period. Look at the rate at which your herd gets in calf over time to identify areas for focus. How did the early versus late mating period go?

Investigating performance for underlying drivers of reproductive performance may help uncover the root causes.

Notes:

Calving pattern

Start with calving pattern. Look at your In-Calf rates by Calving Pattern graph in MINDA reproduction (Figure 7) or at the calving pattern boxes on your Fertility Focus Report (Figure 8).

Look at the not-in-calf rates by calving pattern in the table below the graph.

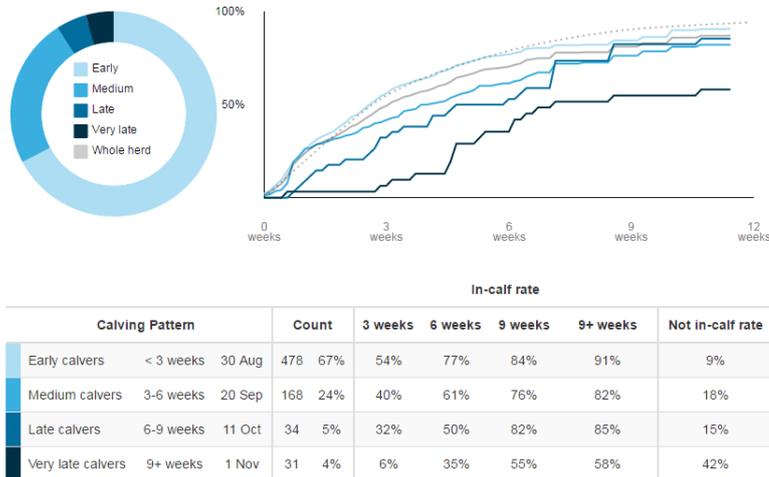


Figure 7. In calf rate by calving pattern

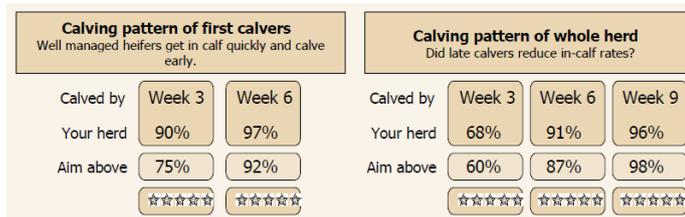


Figure 8. Fertility Focus Report calving pattern indicators

The target is to have more than 60% of the herd calved by week 3 of calving and no more than 13% calving after week 6.

Age group performance

You can assess calving pattern slippage or wastage in your herd by viewing the In-Calf Rates by Age Group graph in MINDA reproduction. Look at the rate at which each age group is getting in calf and their final not-in-calf rates (Figure 9).



Figure 9. In-Calf Rates by Age

You can look for evidence of selection pressure in the genetics section of the Herd Tab in MINDA (Figure 10).

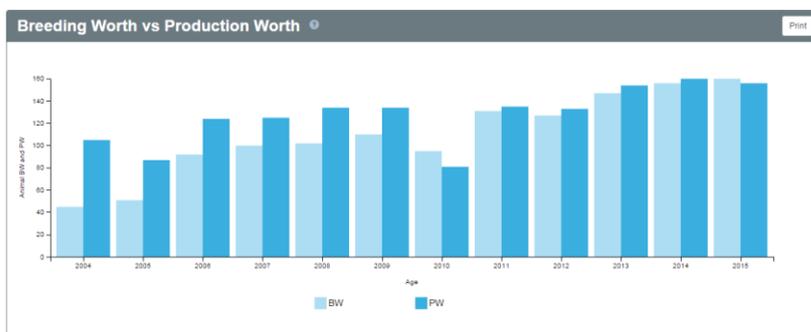


Figure 10. Breeding Worth versus Production Worth (by year born)

With sufficient information in MINDA you can also explore body condition, heifer management, non-cycler and intervention strategy, heat detection efficiency and health event impacts on herd reproductive performance.

Your rural advisors can help with report interpretation so you focus on the areas with the most opportunity for lifting herd quality and farm profitability.

Notes:

Take home messages:

- Maximising herd fertility helps deliver financial benefits through improved herd quality, value of progeny and milk production, reaping more profit from the cows on your farm, year in year out.
- Protecting calving pattern by achieving submission and conception rate targets and high 6 week in-calf rates is the key to sustainable herd fertility.
- Focus on getting the right job done at the right time throughout the life of the animal to manage the eight key fertility management areas.
- Monitor your herd performance and focus on the areas of greatest opportunity.
- Your rural advisors will be happy to help you find the best place to start.

References:

DairyNZ. 2007. The InCalf book for New Zealand Dairy Farmers. Hamilton: DairyNZ, p.150.