

DairyNZ InCalf Fertility Focus Report

Walkthrough

There's always room for improvement



Overview

Getting an accurate picture of performance offers a starting point for improvement. The DairyNZ InCalf Fertility Focus Report gives an overall view of a herd's reproductive performance for a season by way of industry standard key performance indicators; as well as alert you to areas of on farm management that have contributed to the achieved success. There are also aim above targets on the report which have been generated from the results achieved by the top 25% of farmers in a 2003 study, and have also been validated by results from the National Herd Fertility study 2013, as well as reproductive statistics reported in NZ Dairy statistics since 2014.

There are eight identified areas of on farm management that directly impact reproductive performance and thus it's important to identify which areas are going well for you and which could be holding you back. The Fertility Focus Report is a tool that you can use to assist you in assessing your herd's performance in most of these key management areas.

This resource is designed to help you interpret your herd's Fertility Focus Report and gain useful insights as you work to improve your herd's reproductive performance.

Fertility Focus 2017: Seasonal

Report date: 21/12/18
 Farm Code: 123456
 No of cows included: 100
 These cows calved between: 01/01/18 to 31/12/18
 Mating start & end date: 01/01/18 to 31/12/18
 Next planned start of calving: 01/01/19
 Duration of mating: 90 days
 Duration of AI period: 90 days

1 Overall herd reproductive performance

6-week in-calf rate
 Percentage of cows pregnant in the first 6 weeks of mating
 Your herd: 70% (70-71%)
 Aim above: 70%

Not-in-calf rate
 Percentage of cows not pregnant after 90 days of mating
 Your herd: 12% (11-12%)
 Aim for: 9%

% of herd in calf
 Cumulative by week of mating

2 Drivers of the 6-week in-calf rate

3-week submission rate
 % of cows that were inseminated in the first 3 weeks of mating
 Your herd: 77%
 Aim above: 90%

Non-return rate
 % of inseminations that were not followed by a return to heat
 Your herd: 67%
 Aim above: 60%

Conception rate
 % of inseminations that resulted in a confirmed pregnancy
 Your herd: 59%
 Aim above: 60%

3 Key indicators to areas for improvement

Calving pattern of first calvers
 Well managed heifers get in calf quickly and calve early
 Calved by Week 3: 39%
 Your herd: 39%
 Aim above: 80%

Calving pattern of whole herd
 Did late calvers reduce in-calf rate?
 Calved by Week 3: 47%
 Your herd: 47%
 Aim above: 67%

Pre-mating heats
 A high % of well managed cows will cycle before the start of mating
 Your herd: 0%
 Aim above: 85%

3-week submission rate of first calvers
 Well managed heifers cycle early
 Your herd: 82%
 Aim above: 90%

Heat detection
 A high % of early-cycled mature cows should be inseminated in the first 3 weeks of mating
 Your herd: 82%
 Aim above: 95%

Non-cycling cows
 Treated non-cyclers get in calf earlier
 Your herd: 0%
 Aim above: 0%

Performance after week 6
 Expected non-in-calf rate helps assess management effectiveness after week 6 (including bull management and herd nutrition)
 Your herd: 12%
 Aim above: 14%

Rating
 What does it tell me?
 Top result: Ideal - keep up the good work!
 Above average: Getting there - focus on getting the details right.
 Below average: Plenty of areas to improve - use professional advice.
 No result: Not enough information provided - seek help with records.

What should I do?
 Top result: Ideal - keep up the good work!
 Above average: Getting there - focus on getting the details right.
 Below average: Plenty of areas to improve - use professional advice.
 No result: Not enough information provided - seek help with records.

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Overall herd reproductive performance

6-week in-calf rate

6-week in-calf rate is the percentage of your herd that got pregnant in the first 6 weeks of the mating period. 6 weeks are used as a measurement as it gets rid of time variability making results comparable between herds and seasons, it also represents two oestrus cycles and at about week six the difference in how quickly cows are conceiving is most evident between herds. A high 6-week in-calf rate helps to maximise days in milk, the number of AB replacements, and the time cows have to recover post-calving so that they're at peak fertility when mating starts again next season.

The in-calf rate is driven by submission rate and conception rate. The 3-week submission rate describes the portion of cows inseminated in the first three weeks of mating (with 21 days being the length of a cow's oestrus cycle) and the conception rate being the percentage of inseminations that resulted in a pregnancy. Check out Section 2 of the report to see how these are tracking for you.

Not-in-calf rate

Not-in-calf rate is the percentage of cows not recorded as being pregnant at the end of the full mating period. Did your herd reach the 'aim for' target?

6-week in-calf rate and not in-calf rate are directly correlated; whether it's a compact calving or a low empty rate you're after, focusing on maximising your 6-week in-calf rate is a good place to start in achieving your herd reproductive goals.

Now let's look at the 8 key management areas that impact 6-week in-calf rate. You can review how these areas are going on your farm...

1 Overall herd reproductive performance

6-week in-calf rate

Percentage of cows pregnant in the first 6 weeks of mating

Your herd 70% (70-71%)

Aim above 78%

☆☆☆

Not-in-calf rate

Percentage of cows not pregnant after 91 days of mating

Your herd 12% (11-12%)

Aim for 9%

☆☆☆

There's always room for improvement



The Eight Key Management Areas



There's always room
for improvement

Calving Pattern

Boxes on the Fertility Focus Report to look at:

- Calving pattern of first calvers (section three of the report)
- Calving pattern of whole herd (section three of the report)

The calving pattern results for both 'calving pattern of first calvers' and 'calving pattern of the whole herd' are calculated based on this season's mating start date, to display performance in the context of how much time the cows had to recover between this season's calving and mating.

Target: Aim to have less than 12% of cows calving after week 6 of calving.

Calving pattern impacts on:

- Submission rate – Cows are in a Race Against Time and cows that calved before week 6 of calving have more time to recover and start cycling before mating. This generally improves their 3 week submission rate.
- Conception & non-return rate – Studies have shown that conception and non-return rates are higher in early-calving cows compared to their later calving counterparts¹. This is in part because fewer earlier calvers will have their first heat during mating. First heats can be 10-15% less fertile than second and subsequent heats, resulting in lower conception and non-return rates.
- Number of non-cyclers – Early calvers are less likely to be non-cyclers at the start of mating as they've had more time to recover after calving and recommence cycling. Improving calving pattern can help to reduce the number of non-cyclers you have.

What can determine your calving pattern?

It's largely driven by last year's mating performance in the herd, if a high 6-week in-calf rate was achieved the previous year and mating went well it can be expected that the calving pattern will be good. In addition any purchasing and culling decisions may impact calving pattern also.

Other reports to look at for more information on your herd's calving pattern:

- Calving Rate by Age
- In-Calf Rates by Calving Pattern
- Submission Rates by Calving Pattern
- Conception Rates by Calving Pattern

3 Key indicators to areas for improvement

Calving pattern of first calvers

Well managed heifers get in calf quickly and calve early.

Calved by	Week 3	Week 6
Your herd	39%	89%
Aim above	80%	95%
	☆	☆

Calving pattern of whole herd

Did late calvers reduce in-calf rates?

Calved by	Week 3	Week 6	Week 9
Your herd	47%	78%	95%
Aim above	67%	88%	98%
	☆	☆	☆

There's always room for improvement



Heifer Management

Boxes on the Fertility Focus Report to look at:

- Calving pattern of first calvers
- Submission rate of first calvers

Heifers should be some of the most fertile animals in your herd. Whether this is true for you will largely depend on how well your heifers were grown and managed. If all has gone well they're more likely to reach puberty early and get in-calf quickly at 15 months of age, calve down early as first calvers, meet their calving live weight targets, recover well after calving and integrate into the herd successfully².

First calvers take approximately 10 days longer than cows to recover from calving and start cycling again². By being early calvers they're more likely to have had sufficient time to recover so that they don't end up in the non-cycler group.

First calver calving pattern target: 80% and 95% for 3 and 6 weeks

First calver submission rate target: The 3 week submission rate target is 90%.

Heifer management impacts on:

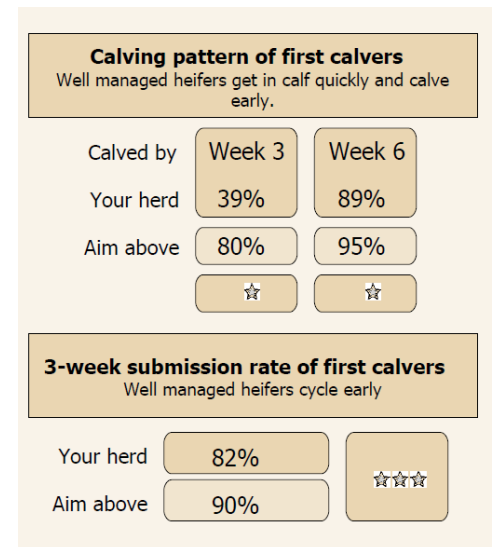
- Calving pattern - undergrown heifers may calve slowly as first calvers which then puts them behind in the [Race Against Time](#) making it more difficult for them to perform well and last in the herd for many years. Help your heifers have a long productive life in your herd by meeting liveweight targets at 15 and 22 months of age, aiming to start them off in the herd as early calvers and to help them stay early calvers.
- Submission rate and conception rate - well grown and managed heifers should cycle and conceive well.
- Non-cyclers - undergrown heifers or first calvers that are struggling in the herd are at risk of becoming non-cyclers. Preferential treatment for these animals may help with performance in the upcoming mating.

Heifer management can be influenced by:

- Calf rearing and growth during the rest of the rearing period (through to 2 years old)
- Calving body condition score (target 5.5) and liveweight
- Calving ease
- Herd socialisation

Other reports to look at that relate to heifer performance:

- The three MINDA Weights graphs
- In-Calf Rates by Age
- Conception Rates by Age
- Submission Rates by Age



There's always room for improvement

BCS & Nutrition

There are no specific boxes on the Fertility Focus Report that measure this management area. However, body condition and nutrition have an effect on most of the Fertility Focus Report parameters. Depressed submission, conception and 6 week in-calf rates can be evident when BCS and/or nutrition are an issue. It is important to remember though that these are just two of many factors that contribute to these figures.

Cows in the optimal BCS range at calving and mating have better reproductive performance, are healthier and less likely to be a non-cycler when mating starts. Nutrition can also impact reproductive performance as changes in feed quantity, quality, or composition can impact on fertility. To give your cows their best chance of conceiving, calve cows at target body condition scores and give them sufficient quality feed in the early post calving and mating periods. Follow industry transition cow feeding guidelines.

Target: Aim for a BCS of 5 (5.5 for 2 & 3 year olds) for calving and 4 – 4.5 for mating (all ages) with BCS loss not exceeding 1 BCS unit between calving and mating

BCS & Nutrition impacts on:

- Submission and conception rates – Research shows that BCS within the recommended ranges is associated with higher submission and conception rates³.
- Non-cyclers – numbers of non-cyclers should be reduced when cows meet BCS targets at calving and mating

BCS/nutrition is impacted by³:

- Quality, quantity and composition of feed
- Cow health

Other reports to look at:

- In-Calf Rates by Body Condition Score
- Body Condition Score by Age

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Heat Detection

Boxes on the Fertility Focus Report to look at:

- Heat detection
- For those doing longer periods of AB the performance after week 6 can indicate the impact of heat detection fatigue

Heat detection efficiency can have a major impact on overall herd reproductive performance. The key to ensuring semen isn't wasted and that cows conceive at the right time is accurate heat detection². The Heat Detection box shows the 3-week submission rate of the early-calved mature cows (cows at least 4 years of age that calved at least 8 weeks before mating start date). In a well-managed herd, a high percentage of early-calved mature cows will be submitted within the first three weeks of mating. This figure is used as an indicator of the efficiency of heat detection.

Target: On the Fertility Focus Report heat detection box – Aim for >95%.

If the Heat Detection figure is below 95%, it's possible that some heats are being missed. Another useful report for assessing the accuracy of heat detection is the Return Intervals Analysis report on MINDA®. If more than 13% of matings are followed by a short (1-17 day) return then it is likely some cows weren't truly on heat when mated, and heat detection accuracy is an issue. If either report misses target, a review of your heat detection policy is likely to be warranted.

Other factors can influence heat detection efficiency. Talk to staff to see if heats are displaying strongly, aids are being maintained well, they recognise the signs of heat, and that the heat detection plan is being followed. Check that tags are clearly visible, records are up to date, and that training, platforms, lighting and drafting facilities are adequate. It all feeds in to final results.

If you choose to do all mating by AB then you'll need to be on top of your heat detection all the way through mating to avoid disappointment. Risk factors change as mating progresses so seek advice to optimise performance.

Heat Detection impacts on:

- 3 week submission rate – Missed heats won't contribute to your 3-week submission rate.
- Conception rate and non-return rate – Cows that aren't on heat when mated won't conceive to the insemination². If there are more than 13% short returns on your Return Interval analysis then heat detection efficiency may be impacting your conception rate and non-return rates.

This area is impacted by²:

- Heat detection processes
- Cow health
- Body condition score at calving and mating

Other reports to look at:

- Return Interval Analysis
- Short Return Indicator
- MINDA® Reproduction Submission Rate for Early Calved Mature cows

Heat detection

A high % of early-calved mature cows should be inseminated in the first 3 weeks of mating.

Your herd 87%

Aim above 95%



Performance after week 6

Expected not-in-calf rate helps assess management affecting performance after week 6 (including bull management and herd nutrition).

Not-in-calf rate

Your herd 12%

Expected 14%

OK

There's always room for improvement



Service Bulls

Boxes on the Fertility Focus report to look at:

- Performance after week 6

Bulls can only service a limited number of cows effectively per day, so you need to follow recommended service bull ratios to ensure you have sufficient numbers for the job.

Managing the bulls well is as important as having enough bulls. Bulls are like athletes – they need to be in top condition to perform well. For example, lame bulls may be reluctant to service cows, and bulls that have recently had a fever may be infertile (1-2 degree rises in testicular temperature can cause infertility for up to 2 months). Following the best management practices with bulls is important to ensure that they're performing well and help to achieve expected not in-calf rate targets².

Aim to run a team of 1 bull for every 30 non-pregnant cows, and have a second team of bulls on rotation². Have at least 2 sexually active bulls in yearling heifer mobs.

Target: Have the same or lower not in-calf rate as the expected not in-calf rate

The 'Performance after week 6' box compares your herds not in-calf rate with your herds expected not in-calf rate (the target). If you've used bulls after week 6 of mating and there's a large gap between these two figures then reviewing your bull management practices could be a good idea.

To figure out if you had enough bulls, look at your In-Calf Rate for Whole Herd report to see how many cows were in calf to AB. Did you have enough bulls in with the herd to have 1 bull per every 30 non-pregnant cows?

Service bulls impact on:

- Calving pattern – bull issues can lead to a spread out calving pattern.
- Not in-calf rate – Have you got an unexpectedly high not in-calf rate given your 6-week in-calf rate? Check for bull issues – too few or poor management.
- Cow Health – BVD can be introduced to a herd by service bulls, with potentially devastating consequences to your herd's not in-calf rate.

Service bull performance is impacted by:

- Insufficient number of bulls
- Bull health
- Cow health
- Herd nutrition through the natural mating period

Other reports to look at:

- In-Calf Rates for Whole Herd

Performance after week 6
Expected not-in-calf rate helps assess management affecting performance after week 6 (including bull management and herd nutrition).

	Not-in-calf rate	
Your herd	12%	OK
Expected	14%	

There's always room for improvement



AB Practices

There are no specific boxes on the Fertility Focus Report that measure this management area.

Good semen quality, semen handling and insemination technique are important to achieve target conception rates^{2,4,5}. AB breeding companies have controls in place to monitor semen quality and technician performance (which is assessed across multiple herds and against other technicians).

Technician performance issues are not reported on the Fertility Focus Report. If you have concerns about technician performance it is important to follow this up with your AB technician service provider.

Genetics

There are no specific boxes on the Fertility Focus Report that measure this management area.

Many traits can be genetically inherited. Some AB sires produce daughters that are genetically more fertile than others, and thus fertility has been incorporated into breeding worth since 2002. In addition to this, things such as gestation length and calving difficulty are also genetically transferred. This ultimately means that sire selection and culling decisions around genetic merit can positively impact your reproductive performance on farm.

With good reproductive performance providing a good number of AB replacements and giving rise to discretionary culling genetics of your herd should be improving generationally over time.

There's always room for improvement



Cow Health

There are no specific boxes on the Fertility Focus report that measure this management area. You should still consider cow health when viewing the report though as it can impact most areas subtly. Similar to BCS and nutrition, an issue with cow health may result in a general depression in performance across submission and conception rates, and therefore in-calf rate. Health issues can also contribute to unexpectedly high not in-calf rates².

Disease and health issues impact on a cow's ability to cycle and get in calf quickly^{1,2}. Some of the diseases that can impact on fertility include mastitis, lameness, reproductive disorders such as endometritis, and BVD². BVD can cause cows to abort pregnancies. If you have an unexpectedly high percentage of long returns on your Return Intervals Analysis you may wish to seek advice about investigating the BVD status of your herd. Reducing disease incidence in herds generally helps improve fertility.

Targets: From calving to week 6 of mating, aim to have fewer than:

- 5% of your cows affected by mastitis or lameness
- 5% of your cows with assisted calvings
- 2% of your cows with retained foetal membranes
- 1% of your cows with vaginal discharge
- 1% of your cows having still born calves

Recording health events can help you detect disease impacts on herd reproductive performance. To see the impact some of these health events have had on your herd's reproductive performance, go to www.minda.co.nz and head to the Pregnancy tab under Reproduction, check out the In-Calf Rates by Diagnosis graph.

Cow health impacts on:

- Submission and conception rates – a good health status allows cows to recommence cycling quickly after calving
- Non-cyclers – conditions such as uterine disease increase the time from calving to when a cow starts cycling. Have a look at your non-cyclers, did a percentage of them have health issues at or around calving/mating?

Cow health is impacted by:

- Calving BCS
- Nutrition – pre- and post-calving (transition cow management)
- Minerals and trace elements
- Biosecurity – e.g. BVD brought onto farm

Other reports to look at:

- In-Calf Rates by Diagnosis
- In-Calf Rates over time
- MINDA Milk – SCC reports
- Bulk Tank Milk BVD testing results
- Health reports in MINDA

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Disclaimer:

Any advice, tasks or suggestions given in this booklet ("advice") are of a general nature only and may not be suitable for your individual herd requirements. We recommend that you discuss your individual herd requirements with your veterinary and farm advisory professionals. Any results from the advice given in this programme booklet may vary and LIC gives no warranty that the intended outcome will be achieved.

References:

¹ Xu, Z., and Burton, L. (2003). *Reproductive Performance of Dairy Cows in New Zealand: Final report of the monitoring fertility project*. Research and Development Group, Livestock Improvement: Hamilton, New Zealand.

² Burke, C., Blackwell, M., Little, S., Campbell, J., and Axford, M. (2017). *The InCalf Book for New Zealand dairy farmers*. Hamilton, New Zealand: DairyNZ

³ DairyNZ (2017). *DairyNZ body condition scoring: The reference guide for New Zealand dairy farmers*. Hamilton, New Zealand: DairyNZ

⁴ DeJarnette, JM., Marshall, CE., Lenz, RW., Monke, DR., Ayars, WH., and Sattler CG. (2004). Sustaining the Fertility of Artificially Inseminated Dairy Cattle: The Role of the Artificial Insemination Industry. *Journal of Dairy Science*, 87:E93-E104

⁵ Vishwanath, R. (2003). Artificial insemination: the state of the art. *Theriogenology*, 59(2):571-584

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