Dairy Australia
InCalf
Your Levy at Work

InCalf

Farm case studies 2017

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Contents

Summary of key findings

All farmers managed calving to achieve their farm profit and farming goals through matching herd feed demand to pasture growth. This 'big picture' understanding underpins the reproductive plan for the farm.

All farmers recorded data and analysed this to measure performance. All record calving dates, cow treatments, cow heats and services.

All used pregnancy testing with most undertaking early pregnancy testing (when cows are between 8–13 weeks pregnant). This information is also essential to plan transition cow management programs.

All use the InCalf measures of empty rate, submission rate and conception rate. Using the number of replacement heifers and/or 6-week in-calf rate (single seasonal and split calving herds) was common.

All set minimum targets and monitored performance regularly. This is especially important in year-round calving herds where each cow needs an individual focus if she is to perform well.

There was strong focus on generating sufficient replacements. Extra replacements allow voluntary culling of late and underperforming cows. Generating extra heifers also helps manage risk. Extra heifers can help farmers recover from the occasional bad year.

All were attentive at calving. Many chose to examine cows before mating that they suspected of carrying an infection from calving. Infected cows were treated by the veterinarian. This helped them to recover and restore fertility before mating.

All farmers have a transition cow management program. These vary in complexity but all farmers see the benefits across cow health, production, reproduction or survival.

Single-season calving farmers focus on getting as many cows calved early as they can. This provides the time that cows need to restore fertility before mating.

There is variable use of synchrony programs and treatments for non-cyclers however; these programs are only used as an aid to getting cows pregnant early. They are not seen as being the total solution.
All understand that addressing the basics remains the key. The effective management of: calving pattern, growing replacement heifers, managing cow body condition and nutrition, heat detection, AI practices, bull mating and cow health are the cornerstones of high in-calf rates.

All farms have an effective culling program. They use the extra replacements they breed to drive aggressive culling.

All use the simplest system they can to achieve their targets. Simple systems are easier to manage and deliver and for workers to implement.

Introduction and project objectives

Historically, most southern Australian dairy farmers calved the herd at one compact calving period at the same time each year. Calving was timed to maximise intake of home grown pasture by milking cows.

The actual time was determined by the expected pasture growth pattern for the farm – calving was timed to begin a few weeks before pasture growth rates peaked as this ensured that peak pasture supply coincided with peak herd demand.
The pressure was on farmers to get as many cows pregnant at the right time from a single short and intense joining period. This system provided for high milk production with the lowest feed cost and thus farm profit was maximised. The 'best practice' herd reproductive programs were directed at providing one single and compact calving period that suited the farm and the farmers' goals.
The principles were the same for everyone – just the timing of events varied around the regions.

The dairy industry has changed dramatically over the past 20 years. The key areas of change have been: changes to the seasonal pasture growth profiles, introduction of new pasture cultivars, increased use of purchased feed supplement and diversification of herd calving systems. The use of split, year-round and batch calving are now more common. Other changes include increasing diversity of milk payment systems – including offering incentives for production of 'out-of-season' milk and a more variable milk payment pattern, deregulation of the national industry and consolidation of processors.

There are more dairy farming systems now being successfully operated than just the historical seasonal single-calving herd. Farmers have learnt how to successfully generate profit across these diverse production systems and to modify management accordingly.
One of the factors that has changed is herd reproductive program management and performance. Change may have been forced on some farmers as reproductive performance has declined but some change has been deliberately planned and implemented. The question now has become *what parts of herd reproductive management have the greatest influence on farm profit?*

The objectives of this series of case studies are:

- to identify the parts of herd reproductive management that successful farmers believe most influence profit
- to describe the practical ways that successful farmers manage the reproductive performance of their herds.
- to identify the common thinking and approaches of successful and profitable farmers. What aspects of reproductive management do they consider most critical? What areas do they focus on? How do they measure and monitor performance? How do they compensate for any underperformance?

Survey method

The case studies were conducted by a combination of survey, data analysis and interview. A selection of dairy farms that were consistently profitable and whose operators were long term clients of a consultancy that analysed farm financial performance were identified.

Farmers were approached to participate and those that agreed were sent a farmer survey in July 2015. This survey captured the opinions, planning and management of the reproductive program on each farm – and how each program was implemented by the farmers. This was supported by a detailed analysis of the herd reproductive performance for a representative year for each farm. Farmers were asked to share their thoughts on what they believe to be the key components of the reproductive program in their herd and how they managed any specific issue arising in the year that was analysed in detail.

Importantly, we sought to understand how each farmer linked the reproductive performance of their herd to farm profit. What areas did they focus on? How did they measure it? What targets did they set? How did they respond to any area of underperformance?

The detailed methodology for the project follows:

Seven consistently highly profitable farms who were clients of OMJ Agricultural Consulting Pty Ltd agreed to participate. Farmers were surveyed and interviewed and their farm financial and reproductive data was analysed.

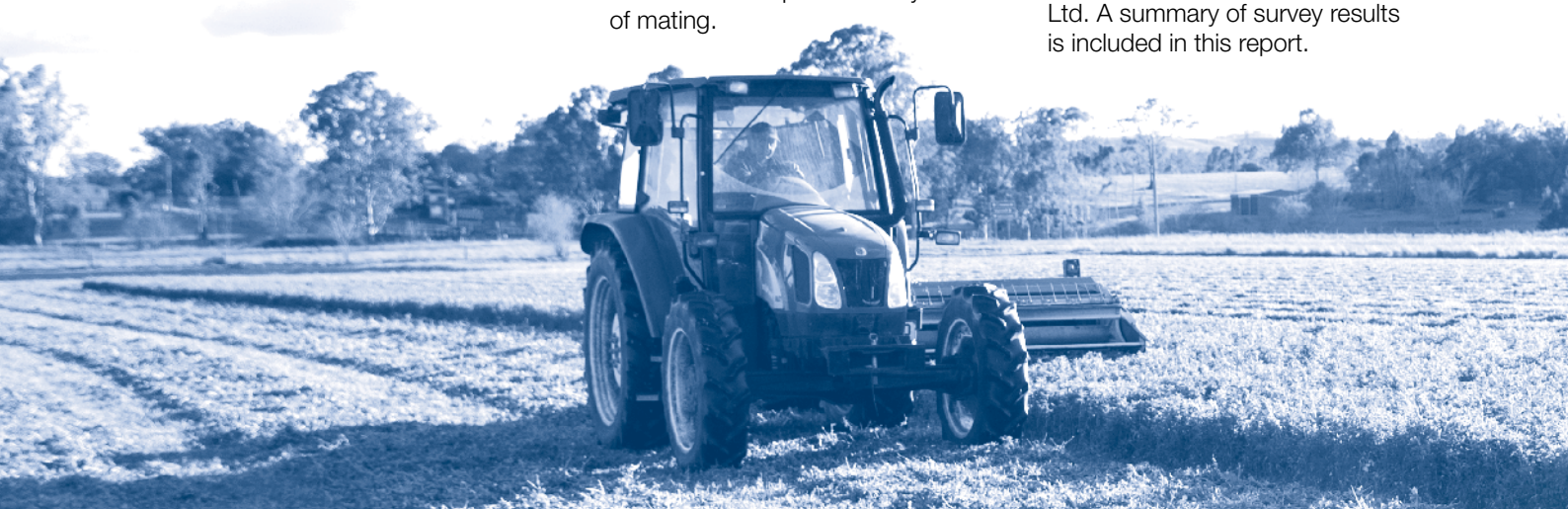
- The primary criterion was that each farm had to be very profitable across several years (based on $EBIT per kilogram of milk solids and percentage return on asset). The analytical approach for assessing profit was consistent with DairyBase. All farms participated in DairyBase.
- The farms selected were diverse. There was at least one representative of each of the common calving systems (seasonal single, split, year-round) and across different calving times (spring and autumn) and milk supply patterns. The farms were geographically spread from Tasmania, Victoria and NSW.

A standardised analysis of herd reproductive performance from computerised herd recording data was undertaken.

- The results of at least one representative joining period on each farm was analysed using a combination of the InCalf Fertility Focus Report supplemented by a detailed retrospective analysis of mating.
- The recommended InCalf measures of reproductive performance were calculated. The key measures of reproductive performance (in-calf and not-in-calf rates) and driver measures of reproductive performance (submission rate and conception rate) were presented.

Each farm manager completed a detailed survey (supplemented by interview as required).

- Farmers were asked to describe the reproductive programs they implemented. The survey questions explored the thinking behind the reproductive management plan and identified the areas that farmers focused on. The specific management actions in transition cow feeding, calving management, pre-mating activities, mating, pregnancy testing and culling were obtained.
- The survey questions identified the reproductive management areas that each farmer regarded as most important for them to achieve their desired level of performance and profit.
- The farmers described the measurements they used to monitor reproductive performance. What were their key areas of focus? How did they assess success? What were their targets?
- The survey was conducted by OMJ Agricultural Consulting Pty Ltd. A summary of survey results is included in this report.



Case studies

Ian and Alice Holloway
Gundowring, north eastern Victoria

Farm description

Facts and figures – average annual performance over past five years	
Herd size	500 Holsteins
Stocking rate	1.3 cows/ha on 86% dryland
Calving pattern	Single
Solids/cow	612 kg
Concentrate level	2.13 T/cow
Pasture consumed/cow	4.6 T DM/cow (includes some young stock intake)
EBIT	$2.56 kg milk solids
Return on assets	11.0%
Cost of production	$4.17 kg milk solids

The Holloways start calving in the last week of March as this provides the best match between the feed demand and the pasture growth pattern for the Kiewa Valley. Autumn breaks are regarded as too unreliable to calve earlier than March and the spring growing period can be relatively short, making calving later than March risky as there would be greater reliance on purchased supplements. The March calving ensures all cows are milking well by spring. The Holloways believe that this maximises milker grazing intake of pasture or crop. A single autumn calving also provides simplicity.

The farm stocking rate is deliberately held low (1.3 cows per ha). This allows all young stock to be kept at home and still provide adequate pasture availability per cow. The Holloways target high pasture intake per cow with sufficient conserved fodder to fill feed deficits when pasture growth is insufficient.

Objectives of the reproductive program

The Holloways' primary reproductive objective is to try and have 85% of cows calved within the first eight weeks of calving. These early calved cows will then have sufficient time to recover from any stress of calving and most will be cycling and at peak fertility before the start of mating.

They want as many cows as possible ready for mating by mating start date (MSD). They target all eligible cows being submitted for AI in the first three weeks of joining.

The Holloways also use a modified 'why wait' prostaglandin synchrony program in cows that are confirmed to be cycling (from pre-mating heat detection) followed by a non-cycling cow treatment program with fixed time AI (FTAI) in any cow not yet detected in heat. This ensures all cows have been inseminated after 21 days of joining.

The Holloways aim to rear at least 30% eligible replacements each year. This is more replacements than they need but by having extra replacements the Holloways make use of the extra heifers to maintain the compact calving pattern. The heifers are joined ahead of the milking cows so that any empty or late pregnant cow can be culled and replaced by an early calving heifer. The Holloways do not use calving induction. This system allows the Holloways to maintain the best match between milking herd feed demand and farm pasture growth.

Herd reproductive program

Before mating start date

- All cows with problems at calving (especially RFMs) are recorded and examined by a veterinarian. Cows identified with uterine infections are treated.
- Heat detection commences before mating (to allow the modified 'why wait' synchrony program to be used in the first week of mating).

After mating start date

- A modified 'why wait' synchrony program in cycling cows is used in the first week of mating. This is followed by a non-cycling cow treatment with fixed time AI (FTAI) in any eligible cow that has not yet been mated. The program is timed so that FTAI occurs around day 21 of mating.
- As a rule, cows are not eligible to be joined until they are 40 days calved.
- The Holloways use AI for eight weeks. Short gestation length (SGL) AI sires are used for the last few weeks of AI to help tighten the AI calving period. AI is followed by bull mating for another 10 weeks – a total joining period of 18 weeks.
- The bull team is actively managed and the team of at least two working bulls is swapped every third day.
- Early pregnancy testing is undertaken six weeks after the end of AI. This allows the Holloways to identify all AI pregnancies and provides the most accurate estimate of calving date in pregnant cows. Follow up pregnancy testing occurs six weeks after the bulls have been removed. Any non-pregnant or suspect pregnant cows are rechecked at this test.
- The Holloways believe that this pregnancy testing program provides the information that they need for effective transition cow management of their herd.

Culling

- Empty cows are culled at the end of lactation – no excuses. Empty, low producers or those with mastitis are sold as choppers.
- Late cows are culled when possible. Culling is not done solely on reproduction. Milk production, age, mastitis and daily profit margin are considered when determining the 'voluntary' cull list. The extra heifers are important to allow very late cows to be culled.
- Late pregnant cows are sold for dairying into spring calving regions at a premium.

Joining of replacements

- Maiden heifers are joined to AI for three weeks. A 'why wait' synchrony program is used to mate cycling heifers and this is followed by a fixed time hormone treatment program for any heifers not mated by the end of the 'why wait' program. This program ensures that most pregnant heifers will calve during the first three weeks of the calving period.
- Jersey bulls are placed with the heifers after the single round of AI.
- The Holloways target replacement rate is 30% of the milking herd size as early pregnant heifers.
- Heifers are joined to calve at the same time as the cows. The Holloways use short gestation length (SGL) sires on the heifers. This has the heifers calving a few days ahead of the cows despite the same mating start dates.

Associated issues that may have an impact on reproduction

- A transition cow management feeding program is provided for a minimum of three weeks for each cow. This is a homemade diet of concentrate (fed at half the milker ration) supplemented with magnesium and other minerals. Wheat or oaten hay is included
- A commercial mineral additive is provided during early lactation.

Mating performance summary (June 2014 joining)

Primary reproductive measures	Farm	Current industry performance (median of 2013 NatSCAN herds)	Industry target
6-week in-calf rate	54.1%	50%	>71%
End-of-mating not-in-calf rate	13.4%*	21% (21-week joining)	<10%*
Drivers of in-calf rate			
3-week submission rate	83.5%	60%	>86%
First service conception rate	48.2%	40%	>53%

*8 weeks AI followed by 8–12 weeks of bull mating

Comments

1. 78% of cows calved 40 or more days before MSD. There was a larger-than-desired 'tail' to calving in 2014.
2. Both the heifers and three year old cows had a higher pregnancy rate than the mature cows.

What do the operators say about what they do?

- We are most interested in cows calved and milking in April and May ready for June 20th MSD. We would be very concerned if, after eight weeks of AI and 8–12 weeks with the bull, there was a 20% empty rate. Getting it very wrong can cost a lot of money and cause angst.
- Heat detection is critical and we don't do anything special but always keep up to date with 'scratchies' [heat mount detectors]; we make sure to keep concentrating on our heat detection beyond the first three weeks.
- We always want cows to be in rising body condition at MSD – it's not all about high production. Cows in calf at the right time is a driver of our profitability.
- We don't have fabulous reproductive performance in our cows but manage around this by trying to have many replacements. We use a long joining period and this lets us sell late calving cows to spring calving herds for good money. This adds to profit and means that every year we are removing late or less fertile animals.
- We do keep good and accurate records on the computer so it is easier to create groups and know any cow's status at any time.
- We like simple. In a perfect world, it would be nice to get the right number of cows pregnant with no synchrony or non-cycling cow treatment programs, but the perfect world does not exist.

Terri Geary
Leongatha, Gippsland, Victoria

Farm description

Facts and figures – average annual performance over past five years	
Herd size	302 (Holsteins)
Stocking rate	2.5 c/ha
Calving pattern	Single (1st July)
Solids/cow	585 kg
Concentrate level	2.1 T/cow
Pasture consumed/cow	3.8 T DM/cow
EBIT	$1.58 kg MS
Return on assets	7.1%
Cost of production	$4.55 kg MS

The herd starts calving in the first week of July. Terri's target is to have the more than 85% of cows calved by 10th August each year. This sets herd peak milk production to early spring and best matches herd feed demand to the pasture growth profile of the farm. In most years, this strategy provides more than 10kg pasture dry matter per milking cow per day across the first 180 days of the season. Terri believes that this is what drives farm profitability as it helps her to achieve good milk production at the lowest cost of production. Also, most of her cows will be gaining weight by the start of mating – and achieving this from primarily a pasture diet.

There is only one calving period. Terri wants to avoid autumn calving as she fears having to battle freshly calved autumn cows through wet winters, a common enough occurrence on the farm. Terri firmly believes that autumn calving would create more problems than it would solve and would force her to reduce the farm stocking rate. Single calving also offers management simplicity. Terri can focus on just one primary task at a time and the herd replacements are even in age, size and body condition. They are simpler to manage as they can be kept in a single group and all have sufficient time to reach target joining weight by the start of mating.

Terri's stocking rate is 2.5 cows per hectare. Terri believes that this stocking rate allows her to achieve high pasture intake per cow and conserve a reasonable amount of fodder. Using reliable home-grown forage keeps the cost of production down and Terri uses this tactic to reduce risk. Some high quality fodder is bought each year to help feed the herd through the dry summer.

Objectives of the reproduction program

Terri's main herd reproductive objectives are for 90% of cows to be calved in the first eight weeks after mating start date and to maximise the number of cows pregnant to AI as this provides for surplus replacements. Having extra replacements allows Terri to cull late pregnant cows and provides an opportunity to sell any surplus replacements. Typically, Terri uses a combination of the two strategies each year – whatever works best to maintain her single seasonal calving system.

Herd reproductive program

Before mating start date

- Any cow that looks unwell after calving is examined by Terri. Cows requiring treatment for uterine infection and those cows that do not fully clean by 10 days after calving are treated.
- All cows are examined for infection around 6–8 weeks after calving by Terri. This internal examination is important because sometimes an infected cow does not show external signs of abnormality or infection. All cows identified by Terri are then drafted for examination and treatment by her veterinarian.
- Terri does not use pre-mating heat detection – she says she is never that organised!

After mating start date

- Heat detection is done twice daily whilst fetching the cows for milking and at milking.
- A prostaglandin (PG) based synchrony program is used for any cow not yet served by 3–4 weeks into joining. This is followed by a veterinary examination and non-cycling cow treatment for any cow that does not respond to prostaglandin.
- There is no voluntary withhold period post calving. Any cow displaying a heat will be joined irrespective of how many days calved she is at the time.
- The AI period varies but is generally of 4–5 weeks duration – AI typically continues until there are consistently fewer than five cows per day detected on heat.
- Terri follows AI with an 8–10 week bull joining. She uses six working bulls. A team of 2 bulls is rotated every 4–5 days. All bulls are fertility checked through a veterinary bull breeding soundness examination (VBBSE) before first use and every two years afterwards. Bulls are always drenched and managed to be in good condition prior to joining.

› The first pregnancy test is conducted 16 weeks after MSD (around 10–12 weeks after the end of AI). A follow up pregnancy test occurs around six weeks after the initial pregnancy test.

Culling

› Culling is an important way that Terri manages the calving pattern. Most non-pregnant cows are culled. An empty cow must be a first or second calver, of good type and high milk production to be carried over.

› Voluntary culling is also not solely based on reproduction. Mastitis, number of replacements, milk price and season are also considerations.

› Cows to be culled are not joined. This impacts on the 'arithmetic' of the calf rate but Terri uses this as a deliberate management strategy to stop the temptation to keep underperforming cows.

Joining of replacements

› A synchrony program with fixed time AI is used on the heifers. Most heifers are inseminated over 1–2 days and then 4–5 bulls are admitted to the mob of 80–90 heifers. This is adequate bull power.

› Terri targets a replacement rate above 30% of the milking herd as pregnant heifers. This gives her the flexibility to cull underperforming and late cows and keep the single and compact calving period that she desires for her herd.

› Heifers are mated at the same time as the cows. Terri uses short gestation (and low birth weight) sires. With this the heifers tend to calve 7–10 days ahead of the cows.

Associated issues that may have an impact on reproduction

› Cows and heifers enter the transition feeding program approximately 14 days before calving. The transition diet is half the milker ration of concentrate and ad lib cereal hay. Magnesium chloride is also added to the water.

› Calcium, magnesium and a mineral pellet are added to the milking cow diet during lactation.

What do the operators say about what they do?

› Transition cow feeding is very important. Less milk fever, less reproductive issues, and quicker cycling.

› Ensure urea is applied three to four weeks prior to grazing – no grazing below this interval.

› Rising plane of nutrition at MSD

› Monitoring each cow re RFMs, mastitis etc, and then the pre-joining check by Terri then vet if necessary on the whole herd.

Mating performance summary (June 2014 joining)

Primary reproductive measures	Farm	Current industry performance (median of 2013 NatSCAN herds)	Industry target
6-week in-calf rate	59.0%	50%	>71%
End-of-mating not-in-calf rate	23.0%	21% (21-week joining)	<13%*
Drivers of in-calf rate			
3-week submission rate	80.0%	60%	>86%
First service conception rate	51.0%	40%	>53%

*13 week joining period.

Comment
85% of cows calved 40 or more days before MSD

Bruce and Andrea Vallance
Nullawarre, near Warrnambool, Victoria

Farm description

Facts and figures – average annual performance over past five years	
Herd size	650 cows (three-way crossbreed)
Stocking rate	3.15 cows/ha
Calving pattern	Split
Solids/cow	560 kg
Concentrate level	1.95 T/cow
Pasture consumed/cow	3.94 T DM/cow
EBIT	$2.60 kg MS
Return on assets	15.0%
Cost of production	$4.00 kg MS

The Vallance farm is coastal with good winter growth rates on the 86 hectares of dryland, but negligible summer growth in most years. The 120 hectares of irrigated milking platform provides good summer pasture helping the farm to support split calving with spring and autumn calving periods. These calving times mean the demand peaks in spring and autumn and is lowest in the winter and summer. This is the best match to pasture growth for the farm.

The stocking rate is 3.15 cows/ha. Farm infrastructure does not support any more cows. The stocking rate allows high annual pasture intake of 3.94 tonnes of dry matter per cow. This in turn drives high cow production with only moderate feeding of purchased concentrates required.

Objectives of the reproduction program

The Vallances want the autumn herd to start calving in February, just after the end of the school holidays, to fit with family time. This timing also takes advantage of irrigated summer feed and the higher milk price. The spring herd starts calving on August 1st. This herd is dry through the winter. This reduces the milking herd feed demand in winter when pasture growth is slow, but increases in line with spring growth.

The Vallances target two tight calving periods (each of seven weeks). This ensures that all cows are calved at least 30 days before the start of mating. The Vallances do not use bulls after AI, as this provides for more empty cows at the end of mating. The Vallances will carry over up to 10% of the herd as empty cows using extended lactation. These cows are mated again at the next joining.

Pregnancy testing occurs eight weeks after the end of AI. With the transition towards crossbreeds the Vallances have raised their target pregnancy rate to 80% (achieving this with 82% of cows pregnant after the 2016 spring joining). This provides enough replacement heifers to maintain the herd size and calving pattern. The percentage pregnant by eight weeks is the critical measure of success used by the Vallances.

The Vallances believe it's very important to closely monitor individual cow performance because they keep carryovers. They don't want 'passengers' to accumulate. The herd age profile, milk production and calving pattern performance helps them identify which cows are not performing and need to be culled.

Herd reproductive program

Before mating start date

No post-calving health examinations or pre-mating heat detection are performed. A whole herd synchrony program with fixed time AI is used because this is considered to be a better use of time and cheaper than alternatives.

After mating start date

- A synchrony program with fixed time AI is used on all cows not mated by the third week of joining. There is a strong focus on heat detection to catch returns.
- This program provides cows with at least two cycles to get in calf during the eight week mating period.
- The short mating period means most cows have calved more than 30 days before the start of mating and most are cycling strongly by the start of mating. This, combined with the synchrony programs generally ensures a tight calving pattern.
- Bulls are not used after AI. They are regarded as too much hassle – and the desired calving pattern can be achieved without them!
- There is no routine examination of cows for infection or reproductive problems after mating but any cow identified as not cycling is examined and will receive a synchrony/non-cycling cow treatment as required.
- The herd is pregnancy tested for the first time five weeks after the start of mating. This allows sufficient time to provide non-cycling cow treatments and mate treated cows before the end of joining. This early pregnancy test allows non pregnant cows 'to get a second chance'.
- A final pregnancy test is conducted eight weeks after the end of joining.

Culling

- Cows are culled after two consecutive 'non-pregnant' test results.
- Underperforming carryovers are culled if sufficient replacements are available.

Joining of replacements

- Replacement heifers are synchronised using a fixed time AI treatment program.
- This single AI mating is followed by herd bulls (four Jersey bulls per 100 heifers). Bulls remain with the heifers for eight weeks and the heifers are pregnancy tested 16 weeks after.
- The target is for more than 25% pregnant replacement heifers available to enter the herd for each calving group. This replacement rate – combined with up to 10% empty cow carryovers – allows effective culling pressure to be maintained.
- Heifers are joined to calve at the same time as the cows. Including the heifers in the transition program means they adjust to the herd and the dairy by the time of calving. The crossbred heifers perform well at mating. The Vallances think there would only be a small benefit from mating them earlier than the cows and this does not outweigh the extra cost and hassle.

Associated issues that may have an impact on reproduction

- Cows are closely observed at calving. Being proactive with calving cows means problems are detected and solved earlier. This extra effort is paid back in the form of better lactation and mating performance.
- This is a large herd so it is important to train and manage staff well. The aims and requirements of the calving and joining period are explained to everyone before calving and again at mating. Everyone is accountable.
- A transition cow management program is applied for 21 days. This is based on low milk fever risk hay, concentrate and supplementary magnesium. The transition cow diet is fed to both the cows and springing heifers and is regarded as a critical component of the calving/joining program.
- The milking herd receive mineral additives during lactation.

Mating performance summary (spring 2014 joining)

Primary reproductive measures	Farm	Current industry performance (median of 2013 NatSCAN herds)	Industry target
6-week in-calf rate	58.5%	50%	>71%
End-of-mating not-in-calf rate	35.9%*	21% (21-week joining)	<20%*
Two-period not-in-calf rate	12.2%	9%	<10%
Drivers of in-calf rate			
3-week submission rate	100%	60%	>86%
First service conception rate	46.5%	40%	>53%

Note: analysis is limited to the spring calving cows unless stated otherwise
*Joining was for only eight weeks; most years this is <20%

Comments
1. 84% of cows calved 40 or more days before MSD
2. 38% of cows not pregnant to FTAI were not detected returning to service for the 2014 spring mating period

What do the operators say about what they do?

- Transition cow feeding is very important. Less milk fever, less reproductive issues, and quicker cycling and cows come in 'firing'
- We were not happy with the 2015 spring results which resulted in 40 less cows in calf than expected. This was not due to anything more complicated than poor heat detection on the returns. This has been remedied by better heat detection training and by checking the cows more frequently. Our long term target and average is for >80% of cows pregnant by the end of joining for each mating period.
- We only use bulls with high Calving Ease Australian Breeding Values.
- A three way crossbreeding program is being used. We are seeing better reproductive performance in the crossbreed cows.
- We believe that a simple management system applied for intense but short periods of time is the best way to achieve results. Everyone on the farm is asked to give total focus to the task at hand – but for only a short period. We have total focus at calving for eight weeks and then at joining for eight weeks, twice a year.
- We are aiming to need only 20% replacements to maintain the herd. Reduced replacement rearing costs improve our profit.

Craig and Phil Tate
Albion Park, NSW coast

Farm description

Facts and figures – average annual performance over past five years	
Herd size	Average 496 (572 lactations) Holstein
Stocking rate	2.81 cows/ha
Calving pattern	Year round
Solids/cow	573 kg
Concentrate level	2.70 T/cow
Pasture consumed/cow	2.70 T DM/cow
EBIT	$2.63 kg MS
Return on assets	6.0%
Cost of production	$5.76 kg MS (NSW)

The Tate farm is coastal. This provides for warm winters that support pasture growth across a reasonably even annual rainfall pattern. Pasture will grow across the year. This supports year round calving. Around 50 cows calve each month. This provides a flat milk supply. The Tates want a simple pasture-based production system. Concentrate and fodder are used only when pasture is in short supply. The farm is stocked at 2.8 cows per hectare as this ensures adequate pasture intake per cow.

Objectives of the reproduction program

The Tates are rigorous in their reproductive management. Year round operators can lose focus on reproductive performance yet still maintain a flat milk supply – but profitability will decline when too many stale cows are milked. Late lactation cows have lower production. They are inefficient users of feed because they require relatively more feed for maintenance than they use for production compared to cows in early lactation. The Tates set clear targets and monitor closely to ensure that this does not occur in their herd.

The main objective is to maintain a constant proportion of freshly calved cows in the herd. This means that sufficient numbers of cows are getting pregnant and calving to prevent the average days in milk from becoming too great. The Tates monitor the average days in milk for the herd carefully and target this to remain between 160–180 days at all times. Any increase beyond 180 days indicates that the cows are taking too long on average, to become pregnant after calving and the Tates' understand that this means profit is being lost.

Reproductive program

During the voluntary withhold period (VWP)

- Each cow has her own mating start date that is determined from her calving date. The Tates use a voluntary wait period (VWP) of 50 days after calving and any cow coming into heat inside her VWP is withheld from mating.
- The VWP is used to examine each cow to determine her reproductive health heading into mating. Cows are veterinary examined with enough time before the end of the VWP to allow them to be treated as required before mating.

During the mating period (post VWP)

- Heat detection is the key activity and focus during mating. The Tates keep good records of calving dates, heat dates, matings, treatments and pregnancy test results. This allows them to identify cows that should be cycling and have not been detected, when cows should return to heat (if not pregnant) and any cow with an unusual return to service (e.g. a short return) are detected. Proactive management of the various mating groups is considered essential for good performance
- Synchrony is not routinely applied but any cow that does not have a natural heat within 50 days of calving will be synchronised at first opportunity using PG.

- A veterinary reproductive visit occurs every four weeks. These visits include pregnancy testing of cows to detect early pregnancy (cows 6 weeks after being mated that have not returned to services) and to confirm pregnancy in late lactation cows (16–20 weeks pregnant). Post-calving examination and treatments are also performed on any freshly calved cow thought to need checking.
- Cows that fail to get in calf after four AIs and are of sufficient merit to keep in the herd are joined to the bull on their next service. A high genetic merit animal (a cow with a production index (PI) above 120) will be mated up to eight times. Cows of lower genetic merit will be joined a maximum of six times.

Culling

Empty cows are usually culled when their production falls below 18 litres per day.

Joining of replacements

- One bull is run with the heifers. This is convenient, but is acknowledged to be a risk (if the single bull turns out to have low fertility or a poor work ethic).
- The Tates aim for 25% replacement pregnant heifers to enter the herd each year.
- Heifers calve between 24–26 months of age.

Associated issues that may have an impact on reproduction

- Cows are closely observed at calving.
- There is a strong focus on effective transition cow management. Cows enter the transition program 28 days prior to the expected calving date. The transition diet includes specialised lead feed pellets, cereal hay and pasture. Transition was extended from 21 to 28 days as this seemed to reduce health problems (including retained membranes and displaced abomasum), increase milk production and to improve herd reproductive performance. Cows confirmed to be carrying twins by ultrasound examination are fed the transition diet for 35 days.
- The Tates work on maintaining cow body condition. They believe this is a key foundation for good reproduction.

What do the operators say about what they do?

- The very critical parameters that we look at are the number of cows pregnant each month, and we follow the AI technician's conception rate as well.
- If we calve fewer than 50 cows per month we become concerned about the impact of failing reproductive performance on profit.
- Good records are essential including calving date, calving ease, and heat records and any problem cows.
- The introduction of a longer transition cow program has improved the herd's reproductive performance and reduced many post calving issues.

Mating performance summary (2014)

Primary reproductive measures	Farm	Current industry performance (median of 2013 NatSCAN herds)	Industry target
100-day in-calf rate	57.0%	30%	>58%
200-day not-in-calf rate	13.0%	36%	<13%
Drivers of in-calf rate			
80-day submission rate	83.5%	37%	>73%
First service conception rate	48.2%	33%	>51%

Comments

1. 78% of cows calved 40 or more days before MSD. There was a tail of late cows
2. The heifers and three year old cows had a higher pregnancy rather than the mature cows

The Leppin Family
Bena, south Gippsland, Victoria

Farm description

Facts and figures – average annual performance over past five years	
Herd size	382 Red breed
Stocking rate	2.73 c/ha
Calving pattern	Single in July
Solids/cow	536 kg
Concentrate level	1.86 T/cow
Pasture consumed/cow	3.6 T DM/cow
EBIT	$2.36/kg MS
Return on assets	9.4%
Cost of production	$3.74/kg MS

The Leppin farm is on hill country and has a wet, pugging soil type that does not support high stocking rates in a wet winter. The Leppins have chosen a single calving period starting in mid-July as they believe this best suits the pasture growth pattern of the farm. There is reliable pasture growth in spring, late autumn and even winter capable of supporting a milking cow rotation. Summer is generally too dry but fodder and crops offset the reduced pasture growth. The overall stocking rate of 2.73 cows per Ha allows for high pasture intakes of 3.6 tonnes dry matter per cow off dryland pastures.

The Leppins believe that the best type of cow for their hilly and often wet farm is a small statured and resilient cow and thus they have chosen to milk red breed cows.

Objectives of the reproduction program

The Leppins want enough cows pregnant to AI to give them sufficient replacement heifers. They have set their replacement target at 25%. The Leppins use the extra replacements to prevent keeping late calving cows as these spread the calving pattern. To achieve the target number of replacement the Leppins aim to get as many cows cycling shortly after calving as possible using minimal intervention.

The Leppins strive for a moderately tight calving pattern without having to resort to the routine use of synchrony programs. The Leppins will use non-cycling cow treatments when they have too many cows identified as non cyclers for them to ignore.

The Leppins use the following measures for assessing the performance of their reproductive program:

- The empty rate at the end of mating
- The (absolute) number of cows pregnant
- The conception pattern of the first calvers (as a guide to heifer rearing, transition and milking herd nutrition).

Reproductive program

Before mating start date

- Cow health is monitored closely and any cow that retains afterbirth or does not clean after calving are examined and treated as required. Whole herd examinations are not undertaken.
- Body condition at drying off is monitored as the Leppins find this is closely linked to subsequent fertility.
- An automated heat detection system is used. This provides pre-mating heat information as well as heat detection during and after the AI period.
- The Leppins target having more than 80% of cows being calved 40 days or more before the start of mating.

After mating start date

- There is no manual heat detection. The automated heat detection system is used exclusively to detect cows for AI.
- The Leppins do not use whole herd synchrony programs. These are not regarded as economical and are unnecessary in their herd.
- AI is used for 14 weeks and then mating stops – no bull mating is used. The AI programs uses dairy semen for the first seven weeks followed by Angus semen in the next seven weeks.
- Known culls are deliberately not joined so there is no temptation to retain them.
- Cows calved fewer than 40 days are withheld from mating at their first heat after calving (if this happens during the mating period).
- Non-cycling cows are identified using the automated heat detection system. If the number of non-cycling cows is excessive, a non-cycling cow treatment program is administered by the herd veterinarian. This is not required every year.

› Early pregnancy testing is undertaken 6–8 weeks after the start of mating. A follow up test in non-pregnant and suspect cows is timed for six to eight weeks after the end of mating.

Culling

As a rule, all the empty cows are culled. An occasional exception is made for empty first calvers that are milking well. No more than five empty cows are carried over in any one year.

Joining of replacements

› The replacement heifers are bull mated using two year old Jersey bulls at four bulls per 100 heifers. These are obtained from a single long term supplier and are reared together as calves to reduce fighting as adults. Bulls are sold after two years of work.

› The Leppins aim for 90–100 replacements calves born each year. This represents 25% of the herd as replacements. This number is sufficient to support the required level of voluntary culling to maintain herd size and calving pattern. The Leppins believe that voluntary culling would become compromised if the number of replacements born drops below 80 (20%).

› Heifers were traditionally joined at the same time as the cows. Recently, matings start date for the heifers has been one week before mating start date for the cows. This was to give the heifers more time to recover from calving before joining as cows.

Associated issues that may have an impact on reproduction

› A transition diet of commercial grain mix and cereal hay is fed to cows and heifers. Cows (only) receive anionic salts in their grain. Transition is managed on the calving pad and the low DCAD diet provides a low risk for milk fever when fed for a minimum of 14 days (but up to 28 days) before calving. The Leppins find that including the heifers in transition helps them to adjust to the herd and the dairy before calving.

› The Leppins believe that the breed of cow is an important factor for their farm and have found that red breed cows tend to get in calf easier and earlier.

Mating performance summary (2014)

Primary reproductive measures	Farm	Current industry performance (median of 2013 NatSCAN herds)	Industry target
6-week in-calf rate	51.5%	50%	>71%
End-of-mating not-in-calf rate	11.0%*	21% (21-week joining)	<13%*
Drivers of in-calf rate			
3-week submission rate	73.0%	60%	>86%
First service conception rate	45.7%	40%	>53%

*12-week joining period

Comment
83% of cows calved 40 or more days before MSD

What do the operators say about what they do?

› A standard transition cow management diet of hay, grain, limited pasture plus a transition cow pellet is used. This has improved control of metabolic disorders and helps to get cows milking – but we are not sure if we have seen any reproductive improvement.

› We still feel that even though we have very good mating and heat records we need to pregnancy test. This data is important for culling and dry cow management.

› Dry cow condition is monitored very closely. We believe it is very important.

› We don't want too many heifers. We prefer having the right number of very well grown heifers rather than a larger number of poorly grown heifers.

› We are comfortable with the level of reproductive performance considering the cost and low level of intervention. If we had more than 15% empty then there might be justification for a more intense program.

› Using automated heat detection has made us realise that the majority of our cows cycle between 10.00 pm and 2.00 am.

› As our production has increased we have found that managing herd reproductive performance has become more difficult and maintaining targets has become harder – even with red breed cows!

AgCAP corporate farm
Blythevale, Tasmania

Farm description

Facts and figures – average annual performance over past five years	
Herd size	810 (Crossbred)
Stocking rate	3.4 c/ha
Calving pattern	Single
Solids/cow	461 kg
Concentrate level	1.52 T/cow
Pasture consumed/cow	3.21 T DM/cow
EBIT	$1.24/kg MS
Return on assets	6.0%
Cost of production	$5.28/kg MS

AgCAP operates four large dairy farms in Tasmania. Each dairy farm has highly skilled and motivated share farmers who control the daily activities on each farm.

Blythevale is one of the AgCAP farms. The share farmers are Wayne and Caroline Sayward. The Saywards milk 810 cows on 240 hectares including 190 hectares of irrigation. Calving commences on the 24th of August. This time was chosen to match peak herd feed demand to the period of maximum pasture growth during spring. Pasture growth rates remain high through spring and into summer on the irrigated paddocks.

The farm aims for a simple but profitable system. There is a single spring calving; there are no carryovers – ever. All work tasks are concentrated into a single period done at a set time each year, calving and mating. Management believes that workers are more efficient and work flows simpler to manage when people only need to focus on a single task at any one time. The herd is crossbred and the farm is stocked at more than three cows per hectare with a production target above 480 kg milk solids per cow per year.

Objectives of the reproduction program

AgCAP management believe 'Good reproductive performance is a key to a simple and profitable farming system. It assists us in maintaining our simple system...'

Key objectives

- For adequate cow longevity (six lactations). This allows a low replacement rate (< 20%). Costs associated with replacements are reduced e.g. AI, agistment.
- A compact calving pattern. The herd will calve within a nine week period. This provides the maximum time for cows to recover from calving and restore fertility before joining.
- Calving is to be compact. Cows that calve earlier will lactate for longer as the dry off date for the herd is fixed (the dairy shuts down over the winter). Cows that calve early produce more milk and are more profitable than late calvers. The farm aims to have 50% of the herd calved by the 16th day of calving.
- Compact calving is easier to manage. Calving cows, transition cow feeding and calf rearing is managed more consistently, if more intensely, than spread calving. The replacement calves are of a similar age and can be reared together as a single group.

Reproductive program

The reproductive program is managed precisely. It is planned around the key dates for the farm. An intensive three week AI period is followed by bull mating. This even provides a few weeks between the end of calving and start of joining that the workers enjoy!

Before mating start date

- The objective is to have more than 90% of the herd calved more than 60 days before the start of mating. The farm had been inducing late pregnant cows (up to 8% of the herd) but calving induction will cease on all AgCAP farms beyond 2018. Management plans to rear extra replacements to enable voluntary culling of late cows.
- No routine reproductive examinations are performed. Only minimal post calving health problems are recorded (e.g. RFMs). No pre-mating heat detection is undertaken. These are deliberate decisions aimed at minimising work load for staff before the intense activity of mating starts.
- A synchrony program using PG is used before the start of mating to synchronise cow returns to occur during the first week of mating. PG is administered at 36 days and again at 21 days before mating start date. Cows that respond to this program should come into a natural heat in the first week of joining.
- PG is also used on cows with metritis/RFM.

After mating start date

The whole farm team work focus is on heat detection. A combination of tail paint and heat mount detectors are used to assist detection of cows on heat. The farm assigns a single key person to heat detection.

Any cow not inseminated by the 7th day of mating is synchronised again with prostaglandin. Any cow not mated by the 13th day of mating is then classified as a non-cycler. These are veterinary examined and treated with a non-cycling cow treatment program that requires a fixed time AI (FTAI) on around day 23 of mating.

- AI is used for three weeks followed by bull mating for another 5–7 weeks (usually only five weeks). Sufficient bull power is important; AgCAP uses one bull per 15–20 non-pregnant cows.
- In the past, there have been two pregnancy tests done but, in future with a nine week mating program, there will be one strategically timed pregnancy test at around 15 weeks after MSD. This will be sufficient to provide foetal aging and to estimate the calving date for all pregnant cows.
- The two critical measures of reproductive performance that are monitored are the proportion of cows in calf to AI and the empty rate at the end of mating.

Culling

Cows not in calf are culled at the end of lactation.

Joining of replacements

- Heifer replacements are synchronised using a fixed time AI program. Following the single blanket insemination, bulls are run with the heifers.
- This program provides an average of 22% replacements available as pregnant heifers ready to enter the herd. This is sufficient to meet requirements and maintain herd size and calving pattern – this is because the herd empty rate is low!
- High replacement numbers are not an objective as this is believed to increase complacency in the breeding program. Higher number of heifers also increase the replacement rearing costs.
- Heifers are joined 1–2 days ahead of the cows.

Associated issues that may affect reproduction

- A simple transition cow management program, as befitting a low cost production system, is used. Transition cows receive concentrate at around 50% the rate of the milkers and ad lib hay. Magnesium chloride (MgCl) is used in the water troughs and transition cows receive a small amount of pasture daily.
- Additives are fed to milkers during lactation. These include calcium, magnesium, and a trace element basic mix.

Mating performance summary (2014 joining)

Primary reproductive measures	Farm	Current industry performance (median of 2013 NatSCAN herds)	Industry target
6-week in-calf rate	80.9%	50%	>71%
End-of-mating not-in-calf rate	12.5%*	21% (21-week joining)	<20%*
Drivers of in-calf rate			
3-week submission rate	100%	60%	>86%
First service conception rate	62.8%	40%	>53%

*Eight weeks of joining

Comment

100% of cows calved 40 or more days before MSD. Over half the herd calved >70 days by MSD

What do the operators say about what they do?

- High reproductive performance is a foundation of our financial performance.
- Our three way crossbreeding program capitalises on hybrid vigour. Cows have longevity, a mature body weight of 480 kgs, capable of producing 480 kgs of milk solids are highly fertile, and need minimal assistance at calving.
- Our herds are self-replacing with just 20% replacements.
- Every step of the reproduction program is placed on the calendar well before MSD so that everyone knows what must be done and when.
- You need to find someone who is doing the job right and copy them – there is no need to re-invent the wheel. External assistance is critical in this regard via our reproductive advisor who has developed our program.
- Simplicity is the key.
- We believe that an empty rate of 15% or more or a spread in our calving pattern would adversely affect our profitability.
- Our people produce the results because they are highly focused and organised. Mating only goes for a short period so people are prepared to put in the extra effort when it counts!

Mick and Julie Fusinato
Neerim, Gippsland, Victoria

Farm description

Facts and figures – average annual performance over past five years	
Herd size	155 Holstein
Stocking rate	2.2 c/ha
Calving pattern	Single calving mid-July
Solids/cow	538 kg
Concentrate level	1.77 T/cow
Pasture consumed/cow	4.2 T DM/cow
EBIT	$1.24/kg MS
Return on assets	3.5%
Cost of production	$4.78/kg MS

The Fusinato farm is on undulating to steep country. The winter pasture growth rates are relatively low but offsetting that, the growth rate in summer is higher than for most of Gippsland. The Fusinatos calve all the cows at a single seasonal calving starting mid-July as this is the best match between herd peak feed demand and the reliable spring pasture growth peak.

This is a small farm operated by family with minimal outside labour employed. Family holidays are important and timed to occur when the cows are dry. The Fusinatos use a simple system. The stocking rate of 2.2 cows per hectare supports high pasture intake by the cows, even in poor seasons, and thus little purchased feed is required. This keeps the cost of production low. However, the stocking rate is sufficient to generate a solid farm annual operating profit in good years.

Objectives of the reproduction program

- A compact seasonal calving pattern is regarded as vital, for farm profit and to allow the annual family holiday.
- The Fusinatos target a minimum of 40 AI heifers as replacements (26%). This is important as it supports adequate culling pressure to be applied to the herd.

Reproductive program

Before mating start date

- All health issues from the start of calving are recorded. Any cow with a problem is identified and earmarked for monitoring and/or examination.
- Cows that retain membranes or don't clean after calving are examined by Mick. Infected cows are treated as required a few weeks before mating.
- Pre-mating heats are recorded for three weeks before the start of mating. The herd is tail painted to assist detection. Any cow that does not cycle in the pre-mating period is drafted and examined by the veterinarian and a non-cycling cow treatment applied as required just prior to the start of mating.

After mating start date

- The Fusinatos have used whole herd synchrony programs at the start of the mating period in the past. However, they have not been pleased with recent results and intend to move back to using natural heat mating for the first round of AI.
- A non-cycling cow treatment program administered by their veterinarian is used if there are too many cows not detected as being in heat during the pre-mating heat detection period. The Fusinatos find that most of these cows have calved late in the calving period.
- Some older and cull cows are deliberately withheld from joining to help resist any temptation to keep them for another year.
- The AI period is typically six to seven weeks followed by six to eight weeks of bull mating.
- A team of two working bulls are rotated with the herd during bull mating.
- A single pregnancy test conducted eight weeks after the end of the bull mating period is used.

Measures of success

- The Fusinatos' key measures are the herd empty rate at the end of mating, the submission rate to AI in the first three weeks of joining and the conception rate to AI.
- The Fusinatos also watch the calving pattern. Too many late cows pose problems in the subsequent mating period.

Culling

A cow is only allowed to be carried over once. Repeat offenders are culled. Most carryovers are selected from first calvers.

Joining of replacements

Maiden heifers are mated to Jersey bulls. No AI is performed on the heifers. There are two groups of heifers, one bull per group.

Associated issues that may have an impact on reproduction

A basic transition diet is fed to cows and heifers for two weeks before calving. This is hay; a strip of pasture with a magnesium supplement.

Mating performance summary (2014 joining)

Primary reproductive measures	Farm	Current industry performance (median of 2013 NatSCAN herds)	Industry target
6-week in-calf rate	55.8%	50%	>71%
End-of-mating not-in-calf rate	26.0%*	21% (21-week joining)	<20%*
Drivers of in-calf rate			
3-week submission rate	95.1%	60%	>86%
First service conception rate	40.0%	40%	>53%

*13-week joining

Comment
79% of cows calved 40 or more days before MSD

What do the operators say about what they do?

- The empty rate this year was higher than expected. Most empty cows were late calvers and high producers. We also think that using a team of only two young bulls was not enough to get the extra empty cows pregnant.
- There was a lower than expected number of AI heifer calves born to cows in 2013. We had fewer replacements than we wanted. This forced us to keep some replacements from bull matings. It has also increased our focus on improving reproductive performance – we won't tolerate any further drop in reproductive performance as this will affect us financially!
- Late calving cows are often tagged as culls and not joined. More than 15% empties at the end of mating is a concern because we can run out of replacements to voluntarily cull them all.
- If we are short of AI replacements, we will rear heifer calves from the jersey bull. This is not ideal but we want enough replacements to keep our seasonal single calving system working.
- Two critical issues to us are to ensure we have well grown heifers. We mate them to calve at the same time as the cows but we calve them separate to the cows and watch them when calving closely. We monitor all cows carefully after calving.
- The calving pattern has not changed greatly for many years. We want to keep that. We send our few carryovers to the neighbour to be milked when we take our family holiday.
- Julie has just completed the 'In Charge' fertility course and has identified some areas that need improvement.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What do all the farms have in common?

All farmers thoroughly understand the effect of calving on farm profit and manage calving and joining accordingly. Calving is controlled to best match herd feed demand to pasture growth and this is understood to be the best way to keep the cost of production down. This whole farm focus underpins the reproductive plan for the farm.

All farmers record data and use this to measure performance. Most use the recommended InCalf measures of empty rate, submission rate and conception rate and many monitor the number of replacement heifers available. For many, this is a substitute for the 6-week in-calf rate (seasonal single and split calving herds).

All record calving dates, cow treatments, cow heats and services. All use pregnancy testing with most undertaking early pregnancy testing (when cows are between 5–15 weeks pregnant) as this provides the measures of reproductive performance and is essential to plan dry off and for effective transition cow management programs.

All set minimum targets and monitor performance regularly. This is especially important in year-round calving herds where each cow needs an individual focus if she is to perform well.

All focus on generating sufficient replacements because extra replacements allow voluntary culling of late and underperforming cows. This was an essential characteristic of seasonal calving herds as it allowed maintenance of a single compact calving.

Generating extra heifers helps manage risk. All aim for more replacements than they absolutely need (as determined by the number of empty cows at the end of mating) as this helps them recover from the occasional bad year or when they regularly struggle to achieve high in calf rates.

The seasonal single calving herd with superior reproductive performance is now in the privileged position of being able to make extra profit by rearing fewer replacements. This is because the herd needs fewer replacements and now AI has been reduced and calving pattern is maintained

All are attentive at calving. Many farmers choose to have cows that are suspected of retaining infection after calving examined and treated as required by their veterinarian before mating.

All farmers have transition cow management programs. These vary in complexity but all farmers see the benefits in either cow health, production, reproduction or survival.

Seasonal single calving farmers focus on getting as many cows calved as early as they can. This provides the time that cows need to restore fertility before mating. Farmers see this as higher submission rates and conception rates than district average.

There is variable use of synchrony programs and treatments for non-cyclers. Not all farmers use these options. Farmers that use synchrony vary in its application – ranging from whole herd synchrony at the start of mating to treating unmated cows after a period of mating. However, these programs are only used as an aid to getting cows pregnant early and not as the solution itself.

All understand that addressing the basics is key. The effective management of: calving pattern, growing replacement heifers, managing cow body condition and nutrition, heat detection, AI practices, bull mating and cow health are the cornerstones of high in-calf rates and eventually farm profit.

All farms have a clear focus on what is required for culling. Many will not join potential culls or late cows, to avoid the temptation to keep her because she is milking well. Most reproductive failures are culled at the end of lactation. Split calving herds mark cows for culling if they fail at their second mating period. Year-round herds monitor the average days in milk. This identifies when too many stale cows are dominating the milking herd. All farmers use the extra replacements to support their culling plan.

Importantly, all use the simplest system to achieve their targets as they can. A simple system is easier to manage, to explain to workers, to identify a problem and to repeat next year.

The detailed reproductive analysis showed that on many study farms performance in at least one area, such as below the industry target 6-week in-calf rate, was below expectations. The outstanding characteristics of these farmers was how they managed these problems and still achieved their farming objectives. This shows that farming success can still be achieved with ‘average’ reproduction if effectively managed. Successful farmers are highly effective at playing the cards that they were dealt. This seems to be a real key to success. It is more important to have all the basics performing to the same standard. Solid pasture production plus solid reproduction is a much better combination than excellent reproduction paired with poor pasture production. The best farmers get the basics across the whole system right most of the time.

The following table provides a summary of the findings discussed in detail under each farmer below.

Measure	Holloway NE Victoria	Geary Victoria	Vallance W Victoria
Profit as ROA %	11.0%	7.1%	15.0%
Profit as $/kg MS	$2.56	$1.58	$2.60
Cost of production	$4.17	$4.55	$4.00
Herd size	500	302	650
Pasture consumption (T DM/cow/year)	4.6T	3.8T	3.9T
Breed	Holstein/Friesian	Holstein/Friesian	3-way cross
Calving	Single (late March)	Single (July)	Split (Feb and Aug)
Pasture profile and growth pattern	Dryland (Aut/Wint/Spr)	Dryland (Aut/Wint/Spr)	42% Dryland (Aut/Wint/Spr) 58% Irrigation
Duration AI	8 weeks	4–5 weeks	8 weeks (x 2)
Duration bull mating	10 weeks	8–10 weeks	0 weeks
Duration mating	18 weeks	12–15 weeks	8 weeks (x 2)
6-week in-calf rate (# 100-day in-calf rate)	54.1%	59.0%	58.5%
End-of-mating not-in-calf rate (^ 200 day not-in-calf rate)	13.4%	23.0%	35.9% (after 1st) 12.2% (after 2nd)
3-week submission rate (* 80-day submission rate)	83.5%	80.0%	100%
First service conception rate	48.2%	51.0%	46.5%
% of herd bred as replacements	30%	32%	26%
Reproductive KPIs	3-week submission rate; AI conception; empty rate	Empty rate; AI conception rate	Percentage cows calved 30 days before MSD; no AI calves (% pregnant to AI); 80%+ pregnant at the end of mating
Transition cow management	3+ wks (important)	2 wks (important)	3 wks (important)
Cow body condition	Important	Important	Important
Reproductive culling	All not-in-calf cows	All not-in-calf cows	All not-in-calf cows after 2 mating periods
Heifers mated to AI	Yes, short gestation length (SGL) sires are used	Yes, short gestation length (SGL) sires are used	Yes
Heifers calve before the cows	SGL sire use in heifers mean they calve a few days ahead of cows	7–10 days (due to using SGL sires)	No
Other features	Large no. heifers to enter herd allows late cows to be sold. This keeps the calving pattern and best matches herd feed demand to pasture supply.	Culls are not joined – so must be culled. This increases the empty rate and demands more replacements. Monitoring of problem cows important (RFMS etc.)	Some empty cows are rolled over from one joining to next but are culled if fail twice. Two tight calving periods best maintains match of feed demand and pasture supply.

Tate NSW	Leppin Victoria	AgCAP Tasmania	Fusinato Victoria
6.0%	9.4%	6.0%	3.5%
$2.63	$2.36	$1.24	$1.24
$5.76	$3.74	$5.28	$4.78
572	382	810	155
2.7T	3.6T	3.2T	4.2T
Holstein/Friesian	Red breed	3-way cross (Genomic)	Holstein/Friesian
All year round	Single (July)	Single (Sept)	Single (July)
Dryland (all year growth)	Dryland (Spr/Aut/Wint)	Irrigated (Spr/Sum/Aut/Low Wint)	Dryland (Spr/Sum/Aut)
4 AIs (year-round mating)	14 weeks	3 weeks	6–7 weeks
2–4 bull services (year-round mating)	0 weeks (no herd bulls used)	5–7 weeks	6–8 weeks
6–8 services (year-round mating)	14 weeks	8–10 weeks	12–15 weeks
57.0%#	51.5%	80.9%	55.8%
13.0%^	11.0%	12.5%	26.0%
83.5%*	73.0%	100%	95.1%
48.2%	45.7%	62.8%	40.0%
25%	25%	22%	26%
Average days in milk; no cows pregnant per month; 200 day not-in-calf rate; AI conception rate	Percentage cows calved 40 days before MSD; empty rate; AI conception rate	Percentage cows calved 60 days before MSD; 3-week submission rate; 6-week in calf rate; empty rate	3-week submission rate; AI conception rate; empty rate
3 wks (important)	2 wks+ (important)	2 wks+ (important)	2 wks+ (important)
Very important	Very important	Important	Important
Not-in-calf (unless v. high merit)	All not-in-calf cows	All not-in-calf cows	All not-in-calf cows
Yes	No	Yes	No
Heifers calve at between 24–26 months of age	Recently, heifer mating begins 1 week before cows	1–2 days before cows	No
Management focuses on the critical parameters of number of cows calving each month and average days in-milk. Proactive cow examinations keep pressure on cows to get pregnant.	Known culls are not joined. Suspect 'dirty' cows are examined pre-joining. Preg. testing used to identify culls and manage transition. Automated heat detection used.	Dry off is determined by season – dairy closes for 6 weeks each year. Synchrony programs are used extensively to get all cows mated early in one intensive short mating period. Labour focus is solely on repro when the cows are being mated.	Compact calving to match herd demand to pasture supply and to allow family holidays. Aim for many replacements (possibly including natural-bred heifers) to allow late cows to be culled.


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