Te Tiringa Farms Limited

Focus on production and profitability

Bay of Plenty | Matt Barr

Farm Systems Change – 2016 Dairy Farm Case Study

Ministry for Primary Industries
Manatū Ahu Matua

Te Tiringa Farms Limited

At a glance

Te Tiringa Farms Limited

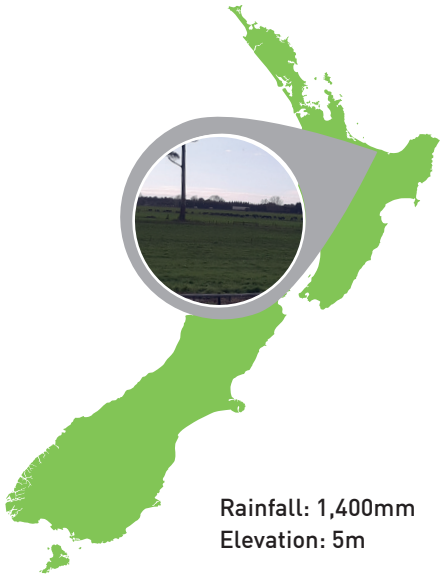
"It is about working smarter"

In 2014 Matt Barr joined his mother in the family business, Te Tiringa Farms Limited. The farm developed by his late father was a solid base on which to build. Matt together with his farm team produced 212,816kgMS from 462 cows at Awakeri near Whakatane in the 2014/2015 season. Always looking for opportunities to learn Matt entered the New Zealand Share Farmer of the Year competition and was 2016 Bay of Plenty Runner-Up Share Farmer of the Year.

Of the 124 hectare milking platform, 102 hectares is owned and 12 hectares is leased. The effective milking platform is 110 hectares. In addition, there is 5 hectares of trees. The dairy support land totals 81 hectares of which 72 is effective, again this is split with 29 hectares owned and 43 hectares leased.

Season Ended	Total kgMS	FWE/kgMS
2012	202,114	No data
2013	194,188	$4.87
2014	230,362	$4.22
2015	212,816	$4.02
2016	193,786	No data

At a glance – 2014/15 Season



Rainfall: 1,400mm
Elevation: 5m

Farm Details

Milking Platform	**124.0 ha**
Dairy support	**81.0 ha**
Total	**205.0 ha**
Effective Milking Platform	**110.0 ha**
Est. kgDM grown (per effective ha/year)	**19,300**
Cows (per effective ha)	**4.2**

Livestock Details

Breed Type	**Crossbreed**
Peak cows milked	**462**
Production per cow (kgMS)	**461**
Live weight per cow (estimated actual kg)	**490**

Other Details

People working on farm	**3.0**
Peak Production (kgMS/ Cow/Day for top month)	**2.1**
Start of Calving	**3 Jul**
Calved in 6 weeks	**86%**
Average Pasture Cover (kgDM/ha at start of calving)	**2,500**
Production (kgMS/effective ha)	**1,935**

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Farming focus

Matt Barr's goal is a farm structure that allows resilience with a low milk payout and potential to capture the benefits with a high milk payout. To achieve his goal his farming system must be able to maintain high productivity in low milk payout seasons and the resilience to withstand climatic conditions in all seasons. Matt applies a **"working smarter, not harder"** approach which is demonstrated by his willingness to test different farming practices and learn from both his own experiences and those of others.

ONCE-A-DAY FOR THE HEIFERS

Matt is willing to test different farming practices to see whether the outcomes may work effectively for him. During the 2014/2015 season Matt decided to try milking the heifers once-a-day as a way to lift and maintain body condition and reshape the farm workload to satisfy both his business and personal objectives.

Read more on Page 5

BUSINESS GROWTH PLAN

Matt grew up on the family farm at Te Tiringa and after finishing school completed a Diploma of Farm Management at Lincoln's Telford campus before heading off to see the world. In 2014 he returned to the family farm as the share farmer, working with his mother who is the landowner. He has developed a clear set of objectives as the foundation against which to measure performance.

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Read more on Page 10

Te Tiringa Farms Limited

A closer look

Once-a-day for the heifers

Trying a different approach – it works for Matt.

The history of milking twice-a-day (TAD) versus once-a-day (OAD) goes back to the very early days when milk was difficult to store. With the improvements in technology the quality of milk in storage can now be maintained for longer and dairy farmers can make choices about the frequency of milking. While there has been discussion about milking frequency the great majority of research on OAD vs TAD milking has been focused on short-term tactical OAD decisions (for example milking heifers OAD until mid-season and then swapping to TAD or milking the herd OAD at the end of the season when feed is low).

Matt has a ten week mating period, using Artificial Insemination (AI) for five weeks followed by Friesian bulls for five weeks. During the spring of 2015 Matt decided not to use Controlled Internal Drug Release (CIDR) in the cows because he wanted the herd to get in-calf naturally and to manage the costs of mating. Matt believed that using the hormones during mating was unnecessary and instead preferred to deliver the best conditions for heifers and cows to get in-calf. The feed got low before mating so he chose to undertake his own trial on milking heifers once-a-day to protect their body condition through mating. The results of his trial in 2015, shown in the table below, led him to adopt once-a-day milking for heifers as part of his farming system for the following season. There was further improvement in 2016 with the 6-week in-calf rate for the OAD heifers at 94 percent and the conception rate at 70 percent, based on heifers mated. This improvement would, in part, be attributable to the OAD milking from calving rather than prior to mating.

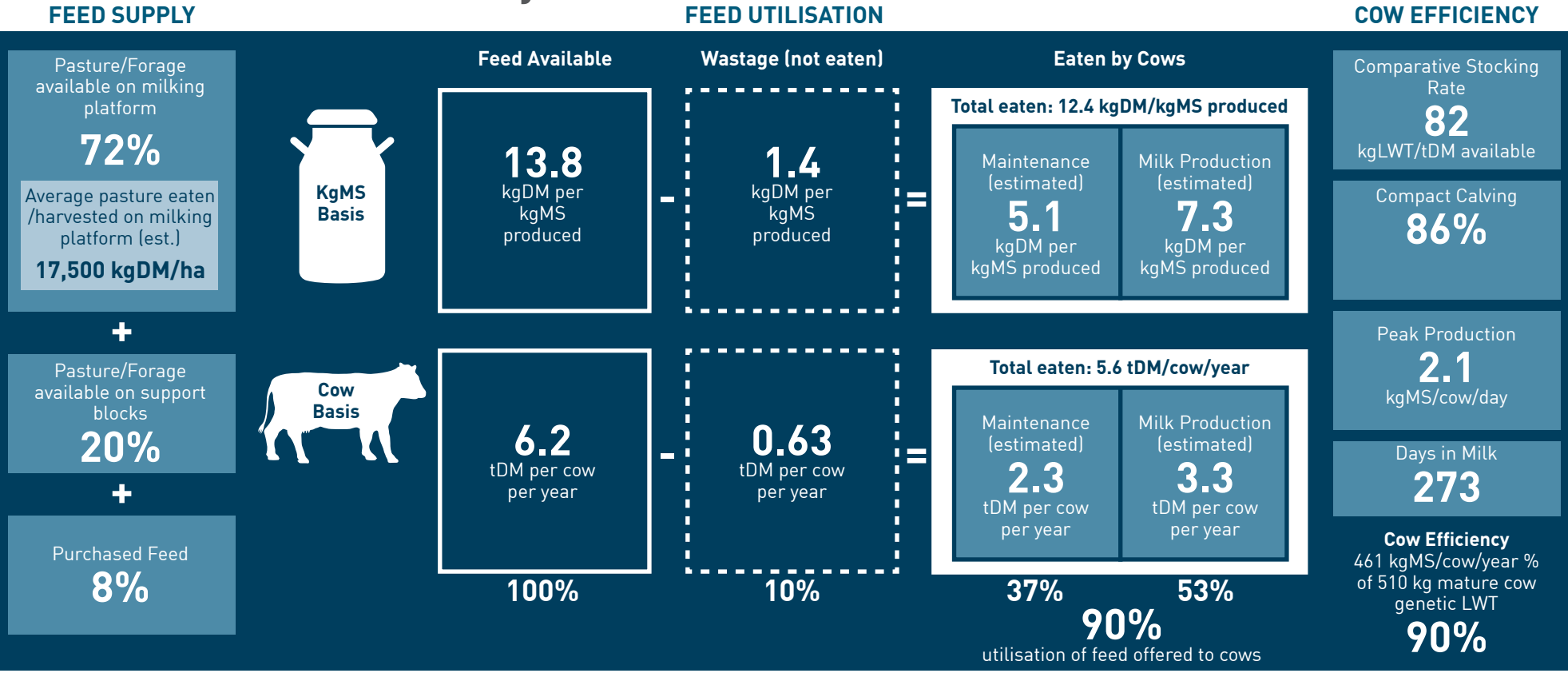
He now milks all the heifers (2016: 85 heifers) and the lighter cows once-a-day from calving until after mating. This assists Matt to achieve higher conception rates naturally without intervention and as a result achieve low wastage rates and low replacement percentages. An added benefit for Matt is that because he runs his herd as two mobs and only one mob is milked in the afternoon he has been able to reduce his farm team by one labour unit.

In addition, during the dryer summer months, Matt may put the herd or a percentage of it onto OAD as well. Matt has achieved his objective from once-a-day milking as his farming business benefits from maintaining the body condition of his cows, using no intervention at mating, reducing the costs of labour, power and shed expenses and gives Matt and the farm team time in the afternoon to undertake other tasks on the farm.

Results of 2015

OAD Trial with 90 heifers	OAD Heifers	TAD Heifers
Number of heifers	45	45
3-week submission rate	82%	90%
3-week in-calf rate	51%	31%
6-week in-calf rate	74%	57%
Conception rate	57%	44%

Feed to milk efficiency 2014/15 season



What does this show?

Feed Supply

It is estimated that 17,500kgDM/ha is eaten or harvested from an estimated 19,300kgDM/ha grown. In total, 72 percent of the herd's requirements come from pasture and feed available on the milking platform. A further 20 percent is grown on support areas, mainly as maize silage, with grass silage and chicory, and 8 percent is purchased as palm kernel expeller. The aim is to be more self-sufficient and minimise exposure to changes in pricing and availability of purchased feed.

Feed Utilisation

The feed pad enables utilisation levels to be maximised with consistently low levels of wastage at between 1.0kgDM/kgMS and 1.5kgDM/kgMS. The farm operates at a relatively high Comparative Stocking Rate requiring excellent pasture management, which then results in high quality pasture and low wastage.

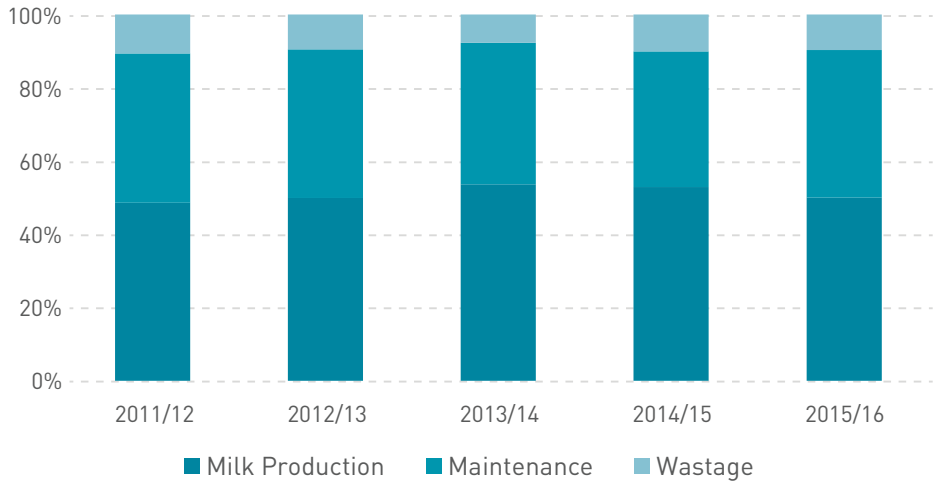
Matt's father developed the farming system on the basis that there was no opportunity to purchase adjoining land. Therefore, the cows must be fully fed from the milking platform and dairy support land. By mid-October 10 hectares of chicory is planted so it is available for grazing when pasture levels drop back during the dry summer.

Cow Efficiency

Matt's focus on feed management sees his herd operate at an estimated 90 percent efficiency in terms of kgMS/kgLWT. The cows are dried off from as early as 10 April to as late as 15 May and the planned start of calving is from 1 July to 4 July. The early calving maximises the pasture growth profile by delivering 68 percent of the annual milk production by 31 December. Matt targets feed delivery to get the best from his herd, he has a focus on transition of the cows into calving and through mating. The peak production was 2.1kgMS/cow/day for October and in this season the days in milk was 273, the highest across the five seasons.

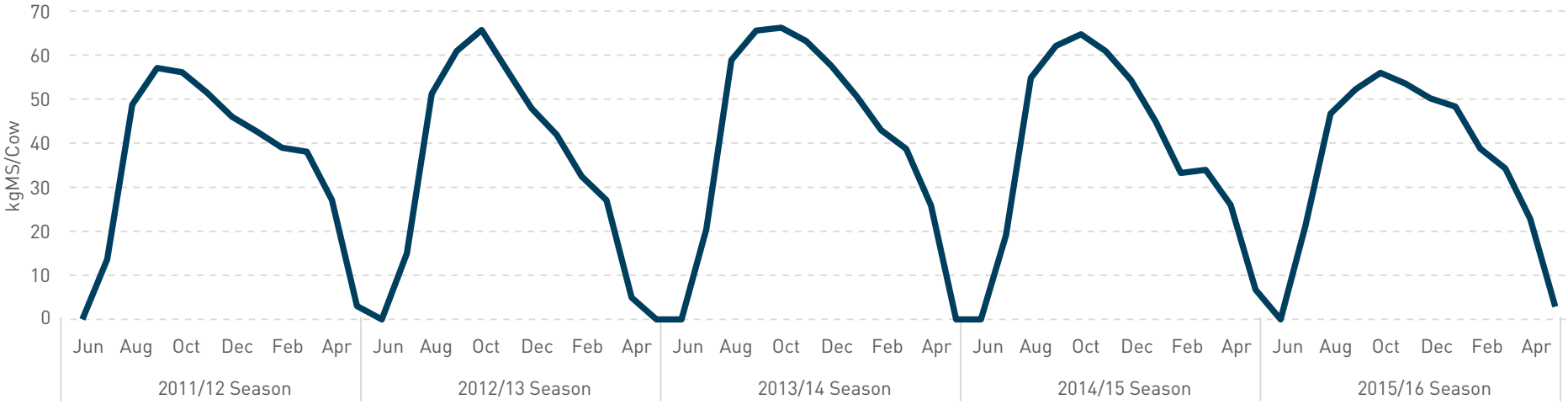
Feed to milk efficiency performance over time

Feed to Milk Efficiency

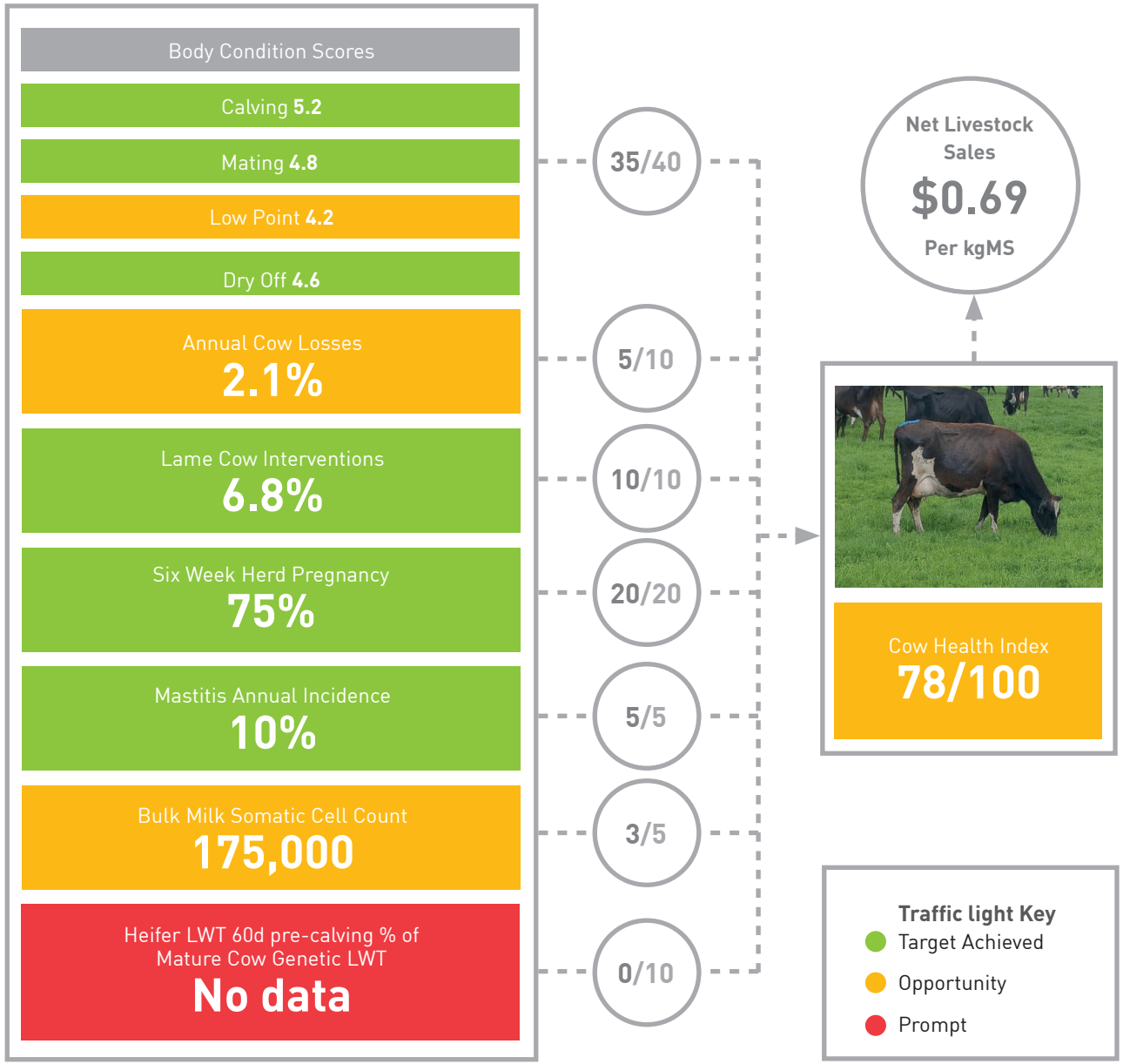


	Season Ended				
	2012	**2013**	**2014**	**2015**	**2016**
Comparative Stocking Rate kgLWT/tDM available	83	87	77	82	85
Farm Feed Conversion kgDM/kgMS produced	14.9	14.6	13.5	13.8	14.5
Cow Feed Conversion kgDM/kgMS produced	13.4	13.2	12.5	12.4	13.1
Feed Wasted kgDM/kgMS produced	1.5	1.4	1.0	1.4	1.4
Feed Grown % of feed available	92%	93%	90%	92%	94%
Feed Purchased % of feed available	8%	7%	10%	8%	6%

Per Cow Milk Solids Production



Animal health 2014/15 season



What does this show?

The Cow Health Index is a weighted score out of 100 comprising body condition score, cow losses, lame cow interventions, herd pregnancy rate, mastitis, somatic cell count and heifer live weight.

The measures are coded using the traffic light system. Green indicates areas where targets have already been achieved, orange where there is opportunity to improve, and red where performance has been less than desired.

Herd Survivability Metrics

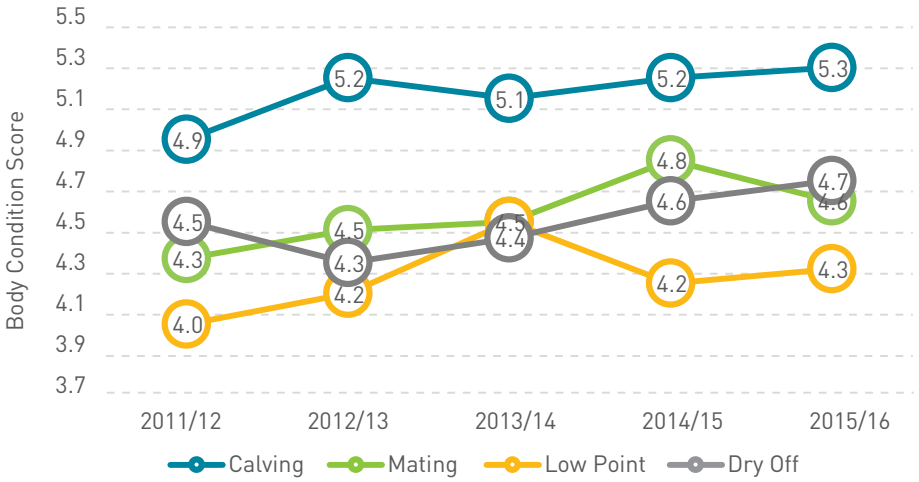
3 year-olds Retention Rate	80%
Replacement Rate at calving	19%
Heifer Mating LWT % Mature Cow LWT	No data
Herd Empty Rate	7%

The 3 year olds Retention Rate measures the number of R2's retained in the herd the following season, this dropped from 95 percent to 80 percent in 2014/2015, which was Matt's first season on the farm. It lifted again to 91 percent in the following season, as Matt learned and adopted the OAD regime.

The Empty Rate has increased from 5.9 percent in 2011/2012 to 7.4 percent in 2014/2015. There are several contributors to this, including the mating period reducing from 13 weeks to 10 weeks and ceasing the use of CIDR's. The rate is very low by industry standards and reflects the good body condition of the herd and the OAD milking of the heifers and lighter cows, resulting in better in-calf rates.

Animal health performance over time

Animal Health



	Season Ended				
	2012	**2013**	**2014**	**2015**	**2016**
Cow Health Index (Max 100)	66	71	71	78	76
Annual Cow Losses	1.6%	1.0%	1.0%	2.1%	1.9%
Lame Cow Interventions	14.0%	13.4%	2.9%	6.8%	5.5%
Six Week Herd Pregnancy	81%	77%	68%	75%	70%
Mastitis	15%	16%	11%	10%	14%
BMSCC (000s)	195	160	167	175	177
Heifer LWT 60d pre-calving % of Mature Cow Genetic LWT	No data	No data	No data	No data	87%

What does this show?

Matt recognises that cow condition is a key driver of production. Across the seasons the average body condition score of the herd has been progressively lifting in all of the critical times – calving, mating, low point and dry off. While there is an opportunity for greater consistency, the challenge is managing the impact of climatic conditions upon feed availability and quality.

Both cow losses and lame cow interventions are low reflecting Matt's continual focus on animal health. The cow laneways are topped with pumice and the once-a-day milking combined with short walks from paddocks to the milking shed assist to minimise the risks of lameness.

Although the Six Week Herd Pregnancy is below the industry target of 78 percent for the last three seasons, in 2016/2017 it increased to 76 percent. It is an area that Matt continues to monitor while working to achieve ongoing improvements. The empty rate has been below 9 percent for the last five seasons.

The mastitis treatments are relatively consistent through the seasons, although the average bulk milk somatic cell count has been trending downward since the 2011/2012 season.

As is the case with many farmers, the weighing of heifers at 60 days pre-calving is not a common practice. Therefore, no data is available for the seasons prior to 2015/2016 and that was the only season when the heifers were weighed.

Although it is generally easy to see if a heifer is unwell, it is harder to determine if the heifer is meeting the target weight and height without actual measurement. The investment in growing out heifers is significant so the closer to mature cow weight and height the heifer is at first calving when joining the herd the better. If the heifer is well grown then feed will be used for maintenance and production rather than her continuing growth. Matt intends to weigh the heifers in the future.

Business growth plan

"It is my turn as 'custodian' on the home farm. As a fourth generation farmer, I'm proud to carry on the farming legacy of my family. I plan to run this farm as a profitable and sustainable business into the future. I plan to create a solid reputation as a well-respected farmer in the farming community." – Matt's Vision

After completing his Diploma of Farm Management, Matt headed overseas to travel and work in Canada, the UK, Europe and Romania in the rural sector before beginning work on an 800 cow farm near Morrinsville. However, he left that job and returned to the family farm when his father was diagnosed with cancer. Following his father's death in 2014, Matt has worked with his mother on the farming business. During 2016 Matt obtained a Chamber of Commerce grant which provided funding for a business coach to work with him, developing his business and planning skills. He appreciates the opportunity to be allowed to grow through the progressive buy-in to the farm business and ongoing personal development. The creation of capacity by putting in good systems is an important foundation for the farming business and gives Matt freedom, knowing all goes well if he is away from the farm.

Matt has sets himself clear objectives and measures performance each month. He uses the revenue and expense data from his monthly invoices and statements to understand the detail of farm income and expenditure. This data is entered into a spreadsheet which enables him to compare current year to prior year and against his selected benchmarks. For example, he enters the detail of each individual drug used from his veterinary invoices/statements to maintain his diary of cow health and his fertiliser recording enables him to plan fertiliser applications for the following season.

Using his actual results as a base, Matt does a lot of 'what if?' scenario planning which enables him to assess the effect of changes in dairy payout and cow numbers. He is focused upon measuring performance to understand what changes may be required as he works toward achieving his objectives.

Where we are now

- Resources are in place to be leveraged from
- Knowledge is within and available to the business e.g. Farm Advisor
- Allowed to grow – expand
  - Supportive family and community
  - Building a new team
  - Performing well
- 470kgMS/cow
- 1,900kgMS/ha
- 0 percent share in Te Tiringa Farms Limited

How to bridge the gap

1. Business Efficiency – performance
2. Feeding – Animal nutrition
3. People – self
4. Capacity
5. Leadership – self

Where we want to be

Have

- Sustainable operation in profits, growth, resources
- A developing team that are progressing their own and the business' performance

Doing

- Identifying and then taking opportunities to progress the business
- Off farm when want – to do what want

Results

- 500kgMS/cow
- 2000kgMS/ha
- Farm Working Expenses < $3.50/kgMS
- Significant ownership > 50 percent in Te Tiringa Farms Ltd

Environmental performance

The farm is located near Awakeri, in the Whakatane River Catchment of the Bay of Plenty. The property has a predominantly flat contour and comprises peat and pumice soils. The total milking platform is 124 hectares and the dairy support land is 81 hectares. These land areas are used effectively in combination for the livestock and growing feed.

After weaning at 95kg the young stock are grazed on the dairy support land until they return to the milking platform for calving as R2s. The dairy support land is also used for wintering the majority of the cows.

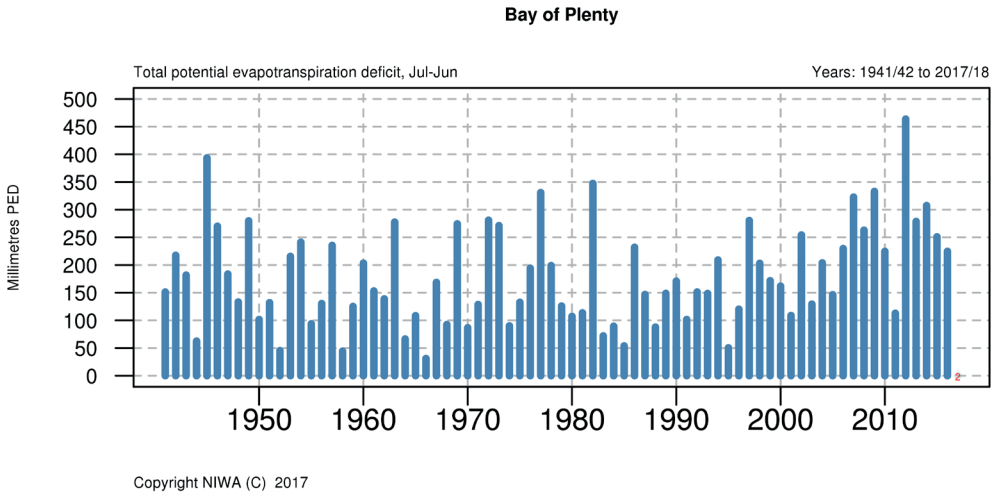
The dairy support land provides security for the dry months during summer. With a focus on self-sufficiency Matt grows maize, grass silage and chicory. The feed pad is used all year round to improve feed utilisation and reduce pasture damage. The feed pad is used before each milking for up to an hour, depending on the feed being supplied. The NIWA graph, shown below, of the total potential evapotranspiration deficit for the Bay of Plenty highlights the 2012/2013 drought spike and illustrates the importance of feed availability.

Alongside the traditional sources of fertiliser, Matt spreads effluent across 50 percent of the farm including application of the solid effluent into the maize block as part of the cropping process. Matt also uses whey, from the Edgecumbe dairy factory, as a fertiliser on areas of the farm. As Matt maintains detailed fertiliser application records he can use this knowledge to develop his future fertiliser plan.

By contrast to the drought of 2012/2013, the 2016/2017 season saw large storms hit the Bay of Plenty with flooding in and around Edgecumbe.

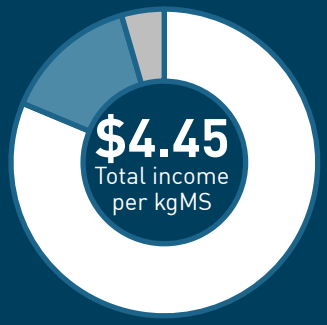
With significant rainfall on the feed pad the challenge is managing the runoff which goes into the effluent catchment.

In the future Matt would like to put a roof over the feed pad to capture the rainwater and potentially recycle the water for other uses on the farm.



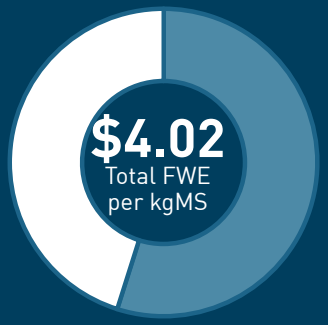
Financial performance 2014/15 season

Income per kgMS



- Milk Income per kgMS
- Livestock Trading per kgMS
- Other Income per kgMS

FWE per kgMS



- Feed Expenses per kgMS
- Other FWE per kgMS

Profit and Loss

	$000s	Per Cow	Per KgMS
Milk Income	752	$1,627	$3.53
Livestock Trading & Other Income	196	$424	$0.92
Total Income	948	$2,051	$4.45
Feed Costs	505	$1,093	$2.37
Other FWE	351	$760	$1.65
Total FWE	856	$1,853	$4.02
EBITDA	92	$198	$0.43

What does this show

Between 2011 and 2014 the farming business was restructured and now comprises a group of three entities. The land and buildings, livestock, plant and equipment and Fonterra shares are held by entities within the group. In addition, Matt's company, Gumtree Dairies Limited is the share farmer. From 1 June 2016 Matt began buying into the herd, with a goal to own 100 percent of the herd within four years and then progress to farm ownership. The financial analysis in this case study is for Te Tiringa Farms Limited only. In the seasons prior to 2014/2015 a contract milker operated on the farm, their share of milk income and costs associated with the delivery of the milk income are not included in this analysis.

Matt's farm ownership objective translates into focusing on income and expenditure, and understanding how to get the most out of every aspect of the farming operation.

The total production has varied depending on the season and the number of cows peak milked. With peak cows of 462 the total production was 212,816kgMS and an average of 461kgMS/cow. Matt aims to generate the milk production profitably by fully feeding a reduced number of cows. By calving early Matt can maximise milk production pre-Christmas. He then has the flexibility to chose his farming system response to the drier weather from January – April.

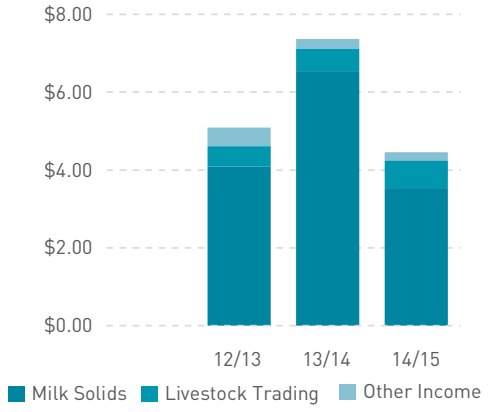
Matt's focus on the detail each month has enabled him to monitor and manage total farm working expenses, which are trending down per kgMS over the past three seasons, this has been achieved even with lower total milk production (kgMS).

Breakeven Milk Price (per kgMS)

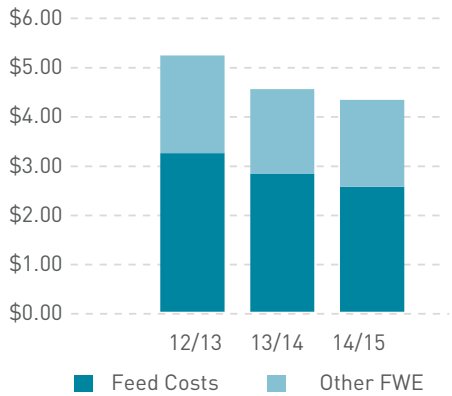
Financial performance over time

Financial Efficiency	2013	2014	2015
Feed cost per kgMS	$3.01	$2.61	$2.37
Other FWE per kgMS	$1.86	$1.61	$1.65
Breakeven Milk Price	$3.87	$3.40	$3.10
Return On Assets %	0%	11%	1%
Capital employed per kgMS	$34	$28	$29
Milk Price	$4.09	$6.54	$3.53

Income per kgMS

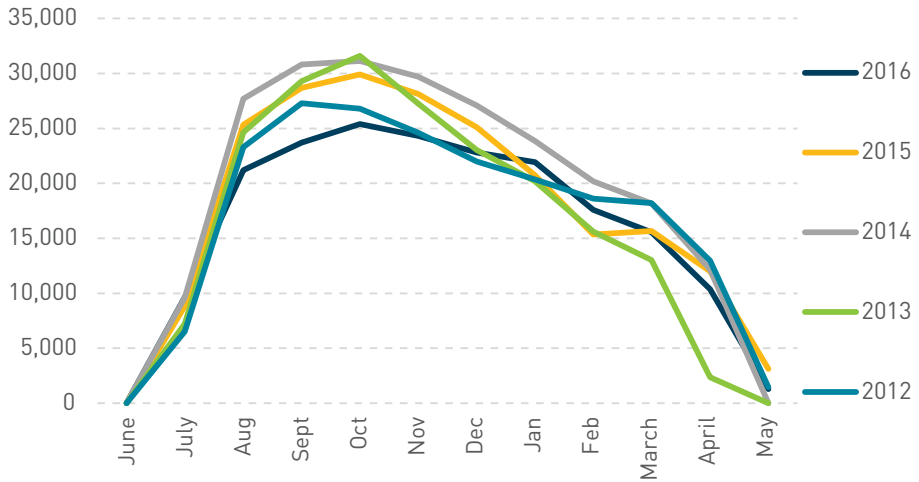


Expenses per kgMS



Profit and Loss to EBITDA (per kgMS)	2013	2014	2015
Milk income	$4.09	$6.54	$3.53
Dividends	$0.45	$0.20	$0.16
Livestock trading	$0.52	$0.58	$0.72
Other operating income	$0.03	$0.04	$0.04
Total income	**$5.09**	**$7.36**	**$4.45**
Feed costs	$3.01	$2.61	$2.37
Other FWE	$1.86	$1.61	$1.65
Total FWE	**$4.87**	**$4.22**	**$4.02**
EBITDA	**$0.22**	**$3.14**	**$0.43**

Monthly production



Ministry for Primary Industries

Definitions

Definitions

General

kgDM	Kilograms of Dry Matter at 11MJ ME
kgMS	Kilograms of Milk Solids
MJ ME	Mega Joules of Metabolic Energy

Animal Health

Actual LWT (Live weight)	Actual live weight of mature cows (5 – 7 years) with Body Condition Score of 4.5 at 100 days in milk
Annual Cow Losses	All cows which died (died, euthanised, pet food) during the season divided by cows calved
BW (Breeding Worth)	The index used to rank cows and bulls based on how efficiently they convert feed into profit. This index measures the expected ability of the cow or bull to breed replacements that are efficient converters of feed into profit. BW ranks male and female animals for their genetic ability for breeding replacements. For example a BW68 cow is expected to breed daughters that are $34 more profitable than daughters of a BW0 cow.
BMSCC (Bulk Milk Somatic Cell Count)	Arithmetic average of Bulk Milk Somatic Cell Count for the season
BCS (Body Condition Score)	An assessment of a cow's body condition score (BCS) on a scale of 1-10 to give a visual estimate of her body fat/protein reserves
Cow Health Index	Weighted score out of 100 comprising BCS (40), Heifer LWT (10), Reproductive outcomes (20), Lameness (10) , Cow losses (10), Mastitis (5) and Bulk Milk Somatic Cell Count (5)
Evapotranspiration	The combined "use" or loss of soil water by transpiration through plants and evaporative loss from the soil and other surfaces to the atmosphere.
Genetic Mature Cow LWT (Live weight)	Live weight Breeding Value from Livestock Improvement Corporation (LIC) (modified by ancestry) for a fully grown mature cow (5 – 7 years) at BCS 4.5 at 100 days in milk
Lame Cow Interventions	The recorded incidence of new lame cow treatments per cows that have calved in the season (new being the same leg after 30 days or a new leg)
Mastitis	The recorded incidence of new cases per the number of cows, including heifers, calved for the season (new being the same quarter after 14 days or a new quarter)
PW (Production Worth)	An index used to measure the ability of the cow to convert feed into profit over her lifetime.
Recorded Ancestry	This is an "identified paternity" measure. The higher the level the more accurate the BW and PW information. It indicates the level of recording of an animal's dam and sire and includes all female relatives related through ancestry (ie sisters, nieces, etc) and is used when she is a calf. The evaluation of untested animals is based solely on ancestry records.
Reliability	A number on a scale of 0 to 99 which measures how much information has contributed to the trait evaluation for the animals, and how confident we can be that a Breeding Value is a good indication of the animal's true merit. The more herd testing data available the higher the score.

Replacement Rate	The number of heifers to calve divided by the total herd to calve for the season, expressed as a percentage
Feed Efficiency	
Comparative Stocking Rate	Total kilograms of mature cow genetic live weight of cows calved divided by tonnes of dry matter available
Cow Feed Efficiency – Eaten	Standardised (11 MJ ME/kgDM) kilograms of dry matter eaten per kilogram of milk solids produced
Farm feed Efficiency – Available	Standardised (11MJ ME/kgDM) or kilograms of dry matter per kilogram of milk solids produced
PKE	Palm Kernel Expeller
DDG	Dried Distillers' Grain
Environmental	
Green House Gas Emissions	Green house gases on a whole farm basis expressed as CO^2 equivalents
Nitrogen Conversion Efficiency	A ratio of product divided by Nitrogen input (Nitrogen input includes fertiliser, supplement and Nitrogen fixation), expressed as a percentage
N loss (Nitrogen loss)	An estimate of the Nitrogen that enters the soil beneath the root zone, expressed as kg N/ha/year
P loss (Phosphorus loss)	An estimate of the Phosphorus lost to water as surface and subsurface run off, expressed as kg P/ha/year
Financial	
Net Livestock Sales	Net Income from Livestock sales (sales less purchases)
Breakeven Milk Price	The breakeven milk price is the payout needed per kgMS to cover the direct costs of production
EBITDA	Earnings Before Interest, Tax, Depreciation and Amortisation and is the cash surplus available from the farming business
Feed Costs	All feed purchases, irrigation, nitrogen, grazing, silage/hay contracting, cropping costs, regrassing, pest and weed control, leases, related wages
FWE (Farm Working Expenses)	Direct farm working costs including owner operator remuneration before interest, taxation, depreciation, amortisation
Livestock Trading	The income from livestock trading including both Net Livestock Income and accounting adjustments for changes to both the number of cows and the value of cows on hand at year end.
Milk Price	Total milk income divided by total kgMS

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ISBN: 978-1-77665-665-3 (online)

August 2017

New Zealand Government