

The Proprietors of Rakaia Incorporation

Recognising the mana of our ancestral land



Canterbury | Tahu a Tao

Farm Systems Change – 2016 Dairy Farm Case Study

Ministry for Primary Industries
Manatū Ahu Matua





The Proprietors of Rakaia Incorporation

At a glance

The Proprietors of Rakaia Incorporation

“We recognise the mana of our ancestral land, our responsibility is to prudently manage and retain the land for the social benefit and enjoyment of our shareholders and their descendants.” – Mission statement

The Proprietors of Rakaia Incorporation have developed their values and goals to align with the protection of their lands for future generations. The property was leased out until May 1996, when the decision was made to terminate the lease. The Rakaia Incorporation then began the journey into dairy development with a “blank canvas”, as there were no internal fences, no buildings, no pastures and no irrigation. The dairy farm was named Tahu a Tao, as the area was Mahika Kai (a food gathering place) and Nohoaka (food gathering resting place), for those travelling up and down the East Coast. The Rakaia Incorporation has a goal to grow its assets and the mana of its shareholders, who whakapapa to the original owners.

In March 2016 the Proprietors of Rakaia Incorporation, together with their 50/50 sharemilkers Mark and Julie Cressey, were recognised as winners of The Ahuwhenua Trophy, the most prestigious award for Maori agriculture in New Zealand.

Season Ended	Total kgMS	FWE/kgMS Owner only Excl. 50/50 Sharemilker
2012	346,711	\$1.28
2013	344,349	\$1.51
2014	345,330	\$1.54
2015	370,774	\$1.58
2016	352,541	No data

At a glance – 2014/15 Season



Farm Details

Milking Platform	222.9 ha
Dairy support	0.0 ha
Total	222.9 ha
Effective Milking Platform	216.0 ha
Est. kgDM grown (per effective ha/year)	19,200
Cows (per effective ha)	3.8

Livestock Details



Breed Type	Crossbreed
Peak cows milked	820
Production per cow (kgMS)	452
Live weight per cow (estimated actual kg)	480

Other Details

People working on farm (FTE)	5
Peak Production (kgMS/Cow/Day for top month)	2.1
Start of Calving	1 Aug
Calved in 6 weeks	93%
Average Pasture Cover (kgDM/ha at calving)	2,270
Production (kgMS/effective ha)	1,717

Farming focus

The overarching farming policy is to operate a sustainable and profitable dairy farm. To achieve this, the Proprietors of Rakaia Incorporation provide a safe and efficient working environment for the farm team. They partner with a skilled and motivated sharemilker, who has responsibility for effectively managing the dairy farm assets.



FARM MANAGEMENT

Integral to the operations at Tahu a Tao are the collaborative relationships between the Committee of Management, the advisors (Secretary and Farm Supervisor) and the sharemilkers. These long standing relationships are supported by effective governance and management processes.

[Read more on Page 5](#)



FARM INVESTMENT

The original owners list contained 27 owners dating back to 1886. This history brings a long term horizon to farm investment and a focus on what is in the best interests of the whanau, both now and into the future. All decisions begin with the mandate to grow mana, care for the land and do what is right.

[Read more on Page 10](#)



Tahu a Tao

A closer look

Farm Management

The Rakaia Incorporation Committee of Management is responsible for the governance of the farming business, on behalf of the owners. The Committee comprises a maximum of seven, and a minimum of three, members. The Committee members are elected by the owners each year. Generally, the Committee comprises of six members, with two members retiring each year and four remaining on the Committee. This is to provide appropriate transition of history, knowledge and the philosophies supporting decision making. This approach enables the Committee to create an even level of tension between new ideas and institutional knowledge.

The overarching farming policy applied by the Committee is to operate a sustainable and profitable dairy farm, by partnering with skilled and motivated sharemilkers who manage the dairy farm assets. In doing so, they provide the sharemilkers with a safe and efficient working environment and a fair and equitable sharemilking agreement. This enables the sharemilkers to operate a resilient, low to medium (cost) system. The longevity of the sharemilkers on the farm is testament to the success of these relationships.

The Committee meets five times each year to review the farm and financial reports including the financial statements, budgets, insurance renewals, sharemilker contracts (and any revisions) and other matters. Based on these reports, and with the input of the Secretary and the Farm Supervisor, the Committee manages the risks associated with the dairy farming business and then reports to the owners (through formal and informal meetings, the annual report, Annual General Meeting and farm visit, and the website).

The Secretary provides the administrative and financial support to the Committee, by processing the day to day transactions and compiling the regular financial reports. In addition, the Secretary is involved in preparation of the annual budget and the financial assessments of potential investments.

The Farm Supervisor assisted with the dairy conversion of Tahu a Tao in 1996 and has worked alongside the Committee and their sharemilkers since then, contributing his experience and practical approach. The Farm Supervisor develops the annual budget in consultation with

the sharemilker and the Secretary and it is then presented to the Committee for approval. The annual budget is a key document used to measure farm performance throughout the year. Other farm performance measures add to the overall assessment of performance and these measures are set by reference to industry norms and benchmarks (including DairyBase).

The Committee, Secretary, Farm Supervisor and sharemilker measure performance with reference to the following:

- Farm cost per kgMS
- kgMS produced
- Dividend paid/EBIT
- Asset base (book value)
- Indebtedness levels
- Health & Safety compliance
- Animal welfare compliance
- Environmental compliance
- Milk Quality
- Cow Milking Days
- Volume/kgMS
- Farm Costs

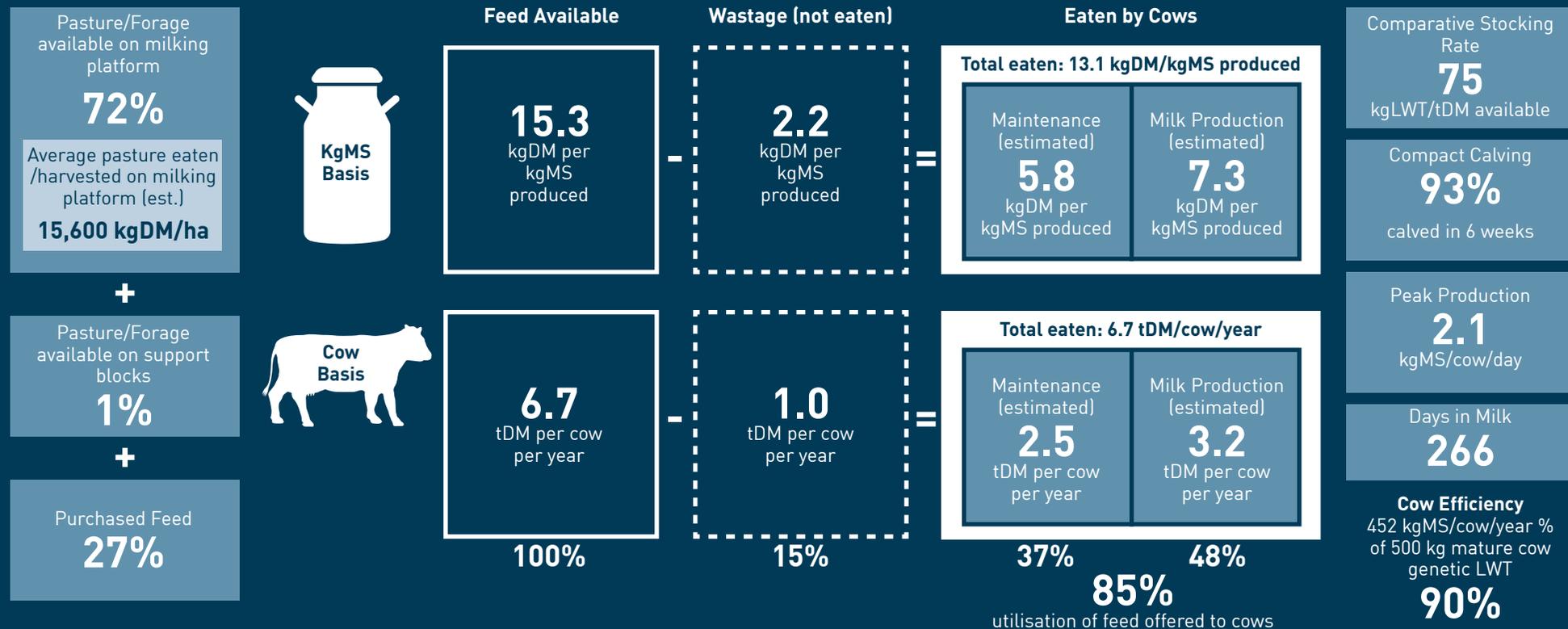


Feed to milk efficiency 2014/15 season

FEED SUPPLY

FEED UTILISATION

COW EFFICIENCY



What does this show?

Feed Supply

It is estimated that 15,600 kgDM/ha is eaten or harvested from the dairy platform. In total, 72 percent of the herd's feed requirements come from pasture, 1 percent from fodder beet and 27 percent of feed is purchased.

16 percent of the purchased feed is predominantly the off-farm grazing for the herd during winter for eight weeks. A mix of baleage, straw and palm kernel expeller form the remaining 11 percent. The use of purchased feed varies year to year, depending upon the pasture plan for the milking platform and the relative cost of feed versus milk price.

Feed Utilisation

The total feed available per kgMS has ranged from 14.0kgDM/kgMS to 15.3kgDM/kgMS. The farm's estimated feed use or conversion of feed to production has been between 12.8kgDM/kgMS to 13.5kgDM/kgMS. This low level is reflective of high levels of feed utilisation from pasture and low levels of complementary feed use. There was an increase in purchased feed, to compensate for the paddocks taken out of the rotation during the pasture renewal program during the 2014 and 2015 seasons. Fodder beet now forms part of the cow diet and the palm kernel expeller use is reducing.

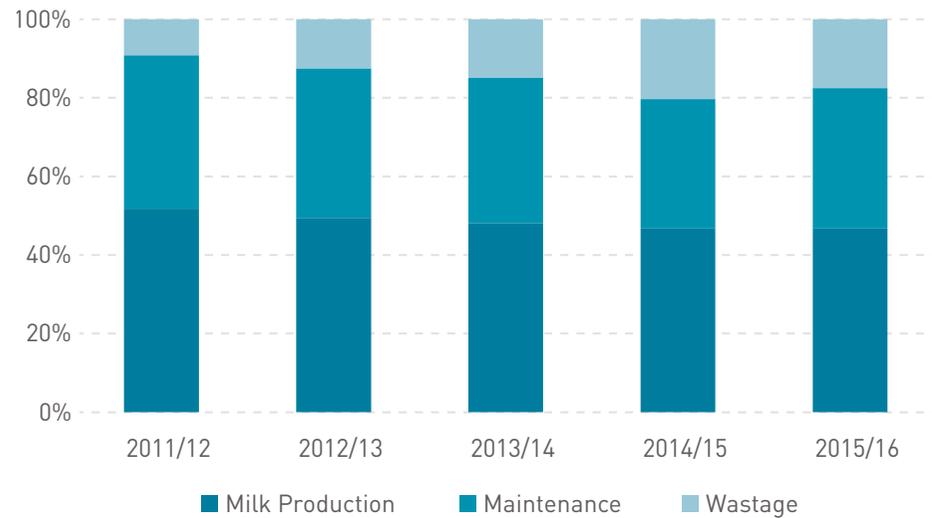
Cow Efficiency

The comparative stocking rate the farm operated at in this season was 75kg mature cow genetic live weight per tonne of dry matter available. The stocking rate has been progressively lowering from 87 in 2011/2012, as pasture production has increased following regassing, while livestock numbers have stayed the same. The milksolids per cow has lifted over the period, from 420kgMS/cow to 452kgMS/cow, in line with the lower comparative stocking rate.

A compact calving at 93 percent and peak production of 2.1kgMS/cow/day in October delivered a very high peak production for 2014/2015, by contrast to other seasons.

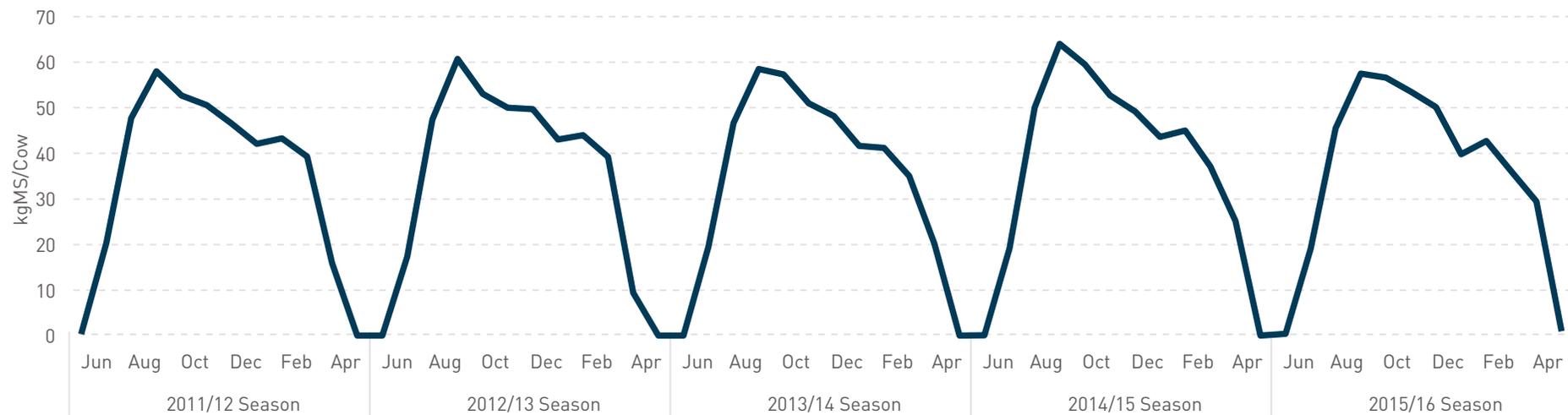
Feed to milk efficiency performance over time

Feed to Milk Efficiency

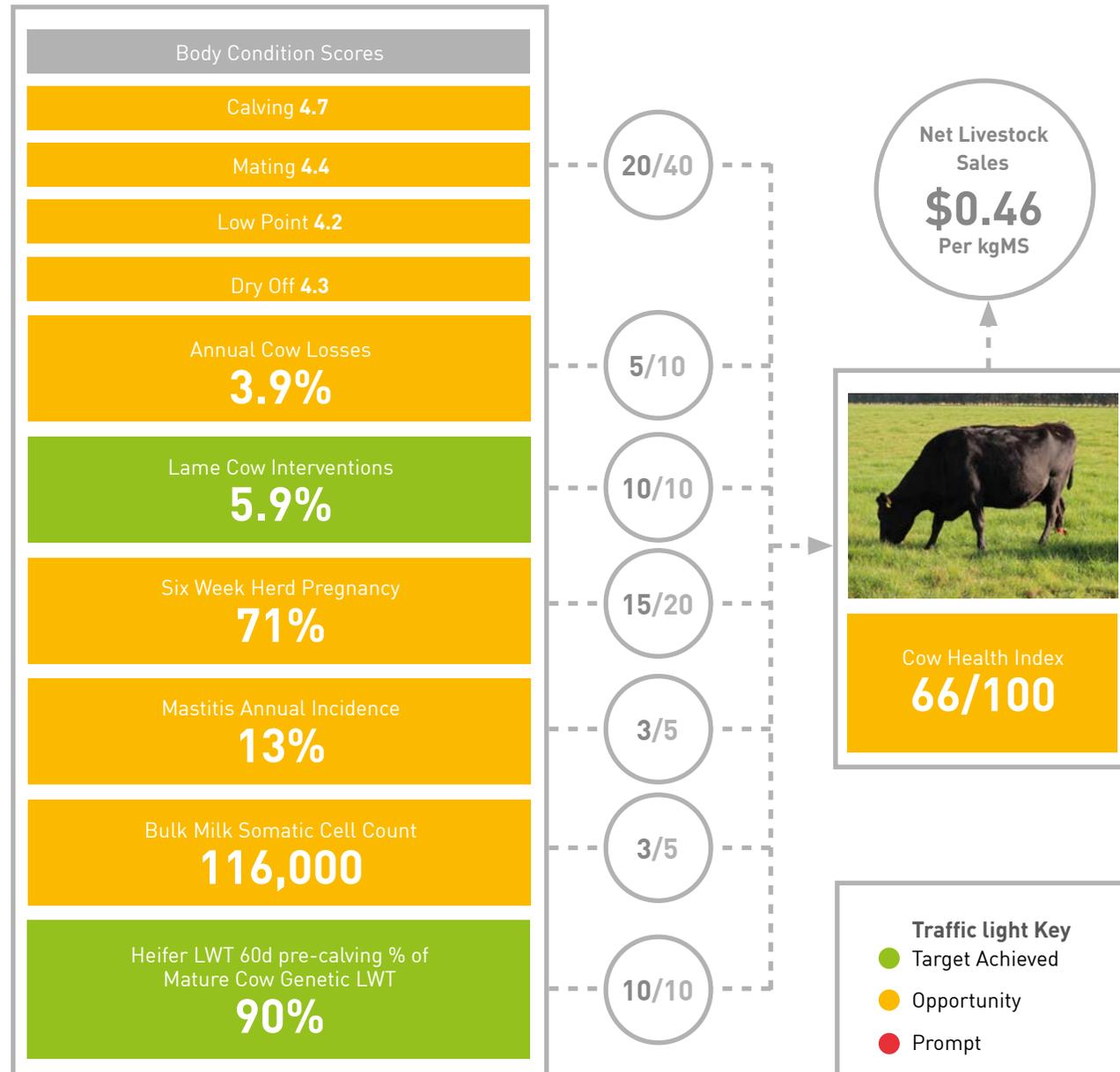


	Season ended				
	2012	2013	2014	2015	2016
Comparative Stocking Rate kgLWT/tDM available	87	84	82	75	79
Farm Feed Conversion kgDM/kgMS produced	14.0	14.7	15.1	15.3	15.0
Cow Feed Conversion kgDM/kgMS produced	12.8	12.9	13.1	13.1	13.5
Feed Wasted kgDM/kgMS produced	1.2	1.8	2.0	2.2	1.5
Feed Grown % of feed available	78%	75%	71%	73%	78%
Feed Purchased % of feed available	22%	25%	29%	27%	22%

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

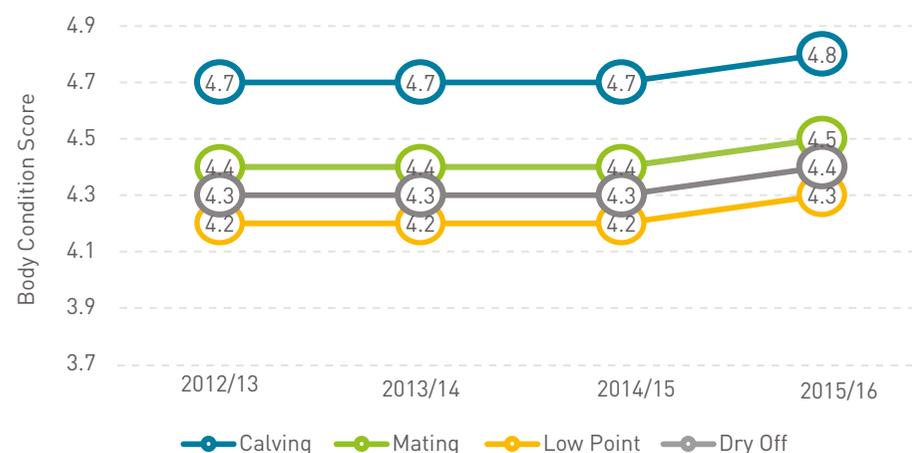
3 year-olds Retention Rate	83%
Replacement Rate at calving	25%
Heifer Mating LWT % Mature Cow LWT	63%
Herd Empty Rate	14%

In the past two seasons, fodder beet has been added to the cow diet, to assist in lifting cow body condition prior to calving. However, even with careful management of the transition of cows to fodder beet, there can be cow losses.

The mating period has reduced from 14 weeks to 10 weeks, which is reflected in the relatively high empty rate of 14 percent, and a compact 6-week calving of 93 percent calved in the first six weeks.

Animal health performance over time

Animal Health



	Season Ended				
	2012	2013	2014	2015	2016
Cow Health Index (Max 100)	68	58	66	66	61
Annual Cow Losses	1.9%	3.6%	2.9%	3.9%	6.2%
Lame Cow Interventions	4.7%	5.2%	5.6%	5.9%	4.8%
Six Week Herd Pregnancy	74%	67%	71%	71%	70%
Mastitis	22%	30%	15%	13%	13%
BMSCC (000s)	158	230	154	116	128
Heifer LWT 60d pre-calving % of Mature Cow Genetic LWT	90%	90%	90%	90%	90%

What does this show?

With the aim of increasing body condition, fodder beet was introduced to the cow diet in the 2014/2015 season. However, with the mix of grass, kale and fodder beet, it seems the cows had too much choice. Those cows that did not like the fodder beet left it for the cows that did. In some instances, this caused acidosis and as a result, there was an increase in cow losses. The splitting of the herd onto the different crops has now been adopted, and aims to minimise the risk of cow losses in the future.

The incidence of lame cows is low, reflecting the focus on staff training and the farm culture. No bulls are permitted on the races or in the yards to protect them and the cows from lameness and injury. Any sick animal is treated immediately.

The pre-mating heat detection commences in September. There are five weeks of AI (Artificial Insemination), followed

by five weeks of bulls. The bulls are rotated and rested on a regular basis. The tail painting continues twice weekly throughout the mating period, to enable accurate mating dates to be recorded. There is a policy of no intervention (Controlled Internal Drug Release - CIDR) and the cows cycle and mate naturally.

Each year, 200 dairy replacement calves are reared. The calves are brought in from the paddocks to the calf sheds twice a day during calving and are fed new colostrum milk as soon as possible after birth. The calves are fed milk until weaning at 80kg and fed meal until 100kg. Throughout the growing out phase, the calves are weighed monthly and any underperforming animals are removed from the mob and preferentially fed. Overall, the heifers are consistently at 90% of mature cow genetic liveweight at 60 days before calving.

The mastitis incidence and bulk milk somatic cell counts have been trending downward over the five seasons, as this has been a focus for the farm team.

The percentage of cows actually calved in the first 6 weeks of calving has progressively improved from 69% in 2011/2012 to 93% in 2014/2015. The shorter mating period has helped focus attention on getting cows in calf straight away, as late calvers were no longer an option. Without any late calving cows, it is then easier to get the herd in calf season to season, as all cows have time to cycle before mating starts. To achieve this, both total feed and type of feed available for the cows to eat influences the end result. The fodder beet is used for wintering, which impacts body condition at calving, whereas PKE is used during the milking season, to complement pasture and hence more directly impacts on production.



Farm investment

The early Committees built the foundation for the Incorporation on the basis of an investment policy, with a mandate to grow and invest with a long term horizon.

The overarching guideline set by the Committee is that further investment opportunities may be considered once external debt levels fall below \$1 million.

The investment policy and the dividend policy are aligned, recognising the need to balance retaining funds to develop and invest for the future, against maintaining and if possible, increasing the dividend distribution to shareholders. There is scope to declare a special dividend when the milk payout is exceptional.

The Committee understand and have been successful with dairy farming. However, to spread the investment risk, the Committee may consider non-farm investment to mitigate the exposure to farming investments.

The evaluation factors applied to the assessment of a dairy farm investment are:

- Farm potential
- Development opportunities and costs
- Sustainable water supply
- Age and condition of farm infrastructure
- Payback time period
- Financial feasibility (sensitivity to interest rates)
- Due diligence (operational, financial, legal)
- Access to quality sharemilkers and herd
- Committee endorsement
- Owner consultation (formal or informal).

The Committee Chair, Committee, Farm Advisor and Secretary undertake the research on the potential investment with input from external advisors when required.

The annual budget process includes capital expenditure. The Committee, Sharemilkers and Farm Supervisor initially discuss the capital requests and make an

operational assessment, then the Secretary undertakes the financial assessment. If plant and equipment is functional and works there is no requirement to change. The annual budget review process identifies the priorities and what needs to be done. This ensures the planning is comprehensive.

One of the key on-farm investments are the irrigators, which are used to maintain consistent grass growth and support the re-grassing program. The Committee have acknowledged the importance of a structured program over a 5 – 7 year period, which enables the whole farm to be re-grassed. Both the farm owner and sharemilker recognise the importance of pasture quality to the farming business. The Rakaia Incorporation, as the farm owner, pays all the costs of re-grassing. The sharemilker has responsibility to achieve the targets for the season. Where there is a need for feed to be purchased to deliver the targets, then the purchased feed cost is split 50/50 between the farm owner and the sharemilker.

Environmental performance

The farm is located within the Ashburton – Rakaia “Red” Nutrient Allocation Zone and will have to comply with the rules stipulated in Environment Canterbury’s Land and Water Regional Plan (LWRP).

The farm topography is flat and the predominant soil types are Lismore silt loam and Eyre silt loam, of between 250mm to 300mm, on a gravelly clay B horizon, overlaying deep gravels. These soils have moderate water holding capacity and are relatively free draining. Therefore, the soils are susceptible to higher levels of N leaching. When the farm was converted to dairying in 1996, it was totally re-grassed. The grasses had high endophyte levels, which made grazing management a challenge. In the past 2 – 3 years, an aggressive re-grassing policy has been adopted, with 30% of the farm re-grassed each season. In the future, the re-grassing program will see approximately 30 hectares re-grassed each season, giving a seven year cycle. This will enable the farm to keep pace with genetic improvements in pasture species and maintain highly productive pastures that use fertiliser and water inputs efficiently. Currently, the predominant pasture species on the property is ryegrass/white clover.

The overall P loss risk is low and sits within the optimum agronomic ranges for dairy farms, primarily due to the flat topography.

The effluent from the milking shed and yard area passes through a silt/stone trap, where solid material is removed. The concrete storage bunkers at the silt trap hold the silt and solids, prior to spreading on the non-effluent farm area every 2 – 3 years. The liquid waste is held in a clay lined storage pond, with a capacity of 800,000 litres, until it is spread over the 65 hectare effluent block. When soil conditions are suitable, the liquid waste is pumped and sprayed onto

the permitted area using a travelling irrigator. Overall, having good storage allows application to pasture at optimum periods for plant uptake and minimises the risk of effluent ponding or run off.

An aquaflex soil moisture monitoring system is fitted in two paddocks, to assist with decisions on when to irrigate and what application rate to use. This improves water utilisation, by applying water in a way that minimises drainage and therefore the losses of nitrogen through leaching.

The farm team have designed their own irrigation scheduler, by recycling the lids off product buckets, which sit inside each other and are attached to the wall in the milking shed. The bottom lid has the paddock numbers and the top lid has cut-outs, so the paddock number in the rotation sequence is easy to see. This ensures the irrigators are used effectively across the farm.



At Tahu a Tao, a recycling system has been initiated for all farm and household waste. In particular, the silage wrap, bale string and plastics are separately sorted. The waste is sorted by category and cleared of unwanted contaminants, before being placed in storage containers to be taken to Ashburton for recycling.



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	781	\$953	\$2.11
Livestock Trading & Other Income	57	\$70	\$0.15
Total Income	838	\$1,023	\$2.26
Feed Costs	372	\$454	\$1.00
Other FWE	214	\$261	\$0.58
Total FWE	586	\$715	\$1.58
EBITDA	252	\$308	\$0.68

Breakeven Milk Price (per kgMS)

Feed Costs

\$1.00

+

Other FWE

\$0.58

=

Total FWE

\$1.58

-

Other Income

\$0.15

=

Breakeven Milk Price
Before debt servicing and depreciation

\$1.43

What does this show

The financial information presented here is for the farm owner only. It therefore excludes the sharemilker income and expenditure.

The Committee are mindful of the fiduciary responsibility to future generations of owners. Therefore, the focus is on sustainable profitability and generation of cashflow. A conservative approach is taken to borrowing. Cashflow is applied firstly to debt repayment and then, when excess cash is available, further investment opportunities are discussed with representatives from the owner families. To date, these investments have been dairy farms.

As the farm owner, the total farm working expenses are maintained at a consistent level, in the range between \$1.28kgMS and \$1.58kgMS.

The increase in feed cost from \$0.75kgMS to \$1.00kgMS reflects the commitment by the farm owner to maintain and improve pasture quality. They have a planned regrassing program and to achieve this, there is greater use of purchased feed. In addition, the farm owner wants the land to rest in the winter, so there is the cost of winter grazing. The investment by the farm owner into the regrassing program has contributed to an increase in the breakeven milk price, from \$0.91kgMS to \$1.43kgMS.

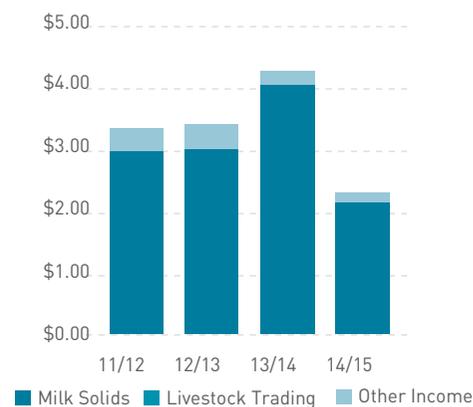
The investment policy adopted by the Committee ensures the capital expenditure purchases contribute to both the value of the property and to operational efficiency. The results of the policy are reflected in the consistent positive return on assets delivered to the farm owner.

Financial performance over time

Financial Efficiency	Season Ended			
	2012	2013	2014	2015
Feed cost per kgMS	\$0.75	\$0.92	\$1.01	\$1.00
Other FWE per kgMS	\$0.53	\$0.59	\$0.52	\$0.58
Breakeven Milk Price	\$0.91	\$1.12	\$1.31	\$1.43
Return On Assets %	6%	5%	8%	2%
Capital employed per kgMS	\$32	\$33	\$31	\$28
Milk Price	\$2.92	\$2.95	\$3.97	\$2.11

Profit and Loss to EBITDA (per kgMS)	Season Ended			
	2012	2013	2014	2015
Milk Income	\$2.92	\$2.95	\$3.97	\$2.11
Dividends	\$0.36	\$0.39	\$0.23	\$0.15
Livestock trading	-	-	-	-
Other operating income	-	\$0.01	-	-
Total income	\$3.28	\$3.35	\$4.20	\$2.26
Feed costs	\$0.75	\$0.92	\$1.01	\$1.00
Other F.W.E.	\$0.53	\$0.59	\$0.52	\$0.58
Total F.W.E.	\$1.28	\$1.51	\$1.53	\$1.58
EBITDA	\$2.00	\$1.84	\$2.67	\$0.68

Income per kgMS



Expenses per kgMS



Panels have been erected directly in-line with the cow entry to the milking platform, which prevents the cows being unsettled by herd testing equipment and other work undertaken within the centre of the turntable.



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)
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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