Moo's 'R' Us Limited

Effective and consistent farm performance

Northland | Corin & Wendy Schick

Farm Systems Change – 2016 Dairy Farm Case Study

Ministry for Primary Industries
Manatū Ahu Matua

Moo's 'R' Us Limited

At a glance

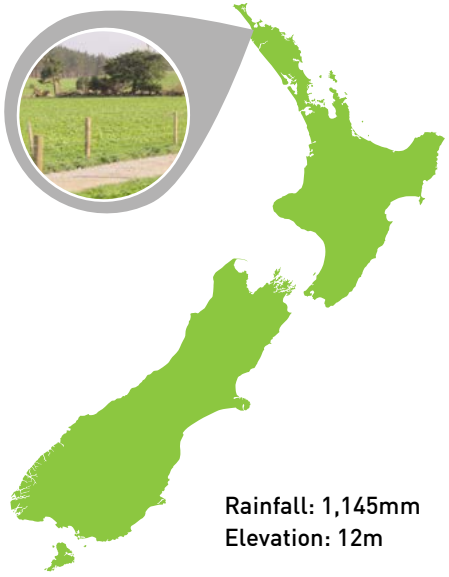
Moo's'R'Us Limited

"We are really pleased with how our cows look now, after making changes to how we feed them. It is nice to be able to feed the cows in a way that maintains their lean muscle weight."

Corin and Wendy Schick are fourth-generation Northland farmers. Starting as 50/50 sharemilkers, they purchased the farm from Corin's parents, Roger and Dale, in 2008. The farm remains very much an intergenerational family business with Roger and Dale interested in the day-to-day farm activities and teaching their grandsons about farming. A herd of 287 Jersey cows are milked across a milking platform of 128 hectares of flat to rolling contour, producing 123,477kg of milksolids in the 2014/15 season.

Season Ended	Total kgMS	FWE/kgMS
2012	135,663	$3.91
2013	120,122	$4.54
2014	119,840	$5.57
2015	123,477	$4.54
2016	126,849	No data

At a glance – 2014/15 Season

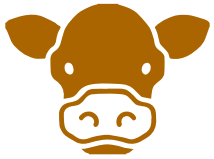


Rainfall: 1,145mm
Elevation: 12m

Farm Details

Milking Platform	**128 ha**
Dairy Support	**- ha**
Total	**128 ha**
Effective Milking Platform	**124 ha**
Est. kgDM grown (per effective ha/year)	**13,400**
Cows (per effective ha)	**2.3**

Livestock Details



Breed Type	**Jersey**
Peak cows milked	**287**
Production per cow (kgMS)	**430**
Live weight per cow (estimated actual kg)	**440**

Other Details

People working on farm	**3**
Peak Production (kgMS/ Cow/Day for top month)	**1.9**
Start of Calving	**9 July**
Calved in 6 weeks	**86%**
Average Pasture Cover (kgDM/ha at start of calving)	**2,412**
Production (kgMS/effective ha)	**996**

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Farming focus

Corin and Wendy Schick take a simple approach to managing their farm and cows. With guidance from their key advisors, they're focused on bringing fresh ideas balanced against proven systems for the continuous improvement of their farming business.

EFFECTIVE FEED MANAGEMENT

Corin and Wendy are focused on balancing quality and quantity of feed. Their system is simple requiring little capital investment. By doing this, they have insulated themselves as best they can from the variability of the Northland climate.

Read more on Page 5

IMPRESSIVE COW PERFORMANCE

Corin and Wendy are also focused on the performance of their herd. They consistently feed the cows well and this is reflected in the excellent body condition scores, which the cows hold throughout the season. Their Jersey herd is impressive with each cow or heifer producing 430 kgMS – 98 percent of mature cow genetic live weight.

Read more on Page 8

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A closer look

Effective feed management

The Northland climate creates potential constraints to milk production as wet springs and dry summers impact pasture utilisation in the spring and pasture quality over the summer.

Corin and Wendy focus on feed supplied to ensure their cows are consuming 4 percent of bodyweight as dry matter. Achieving this requires consistency and quality of feed supply. To mitigate their exposure to dry weather, they considered feed solutions which maintained the simplicity of their farming system, provided flexibility for future change, developed the farm, and minimised financial investment.

Corin and Wendy bought a neighbour's farm in 2010 to join onto the milking platform. They then implemented an aggressive pasture renewal programme. Corin and Wendy spray out the old kikuyu pasture in the autumn, sow an annual ryegrass for the winter, taking this as silage (after some winter grazing when possible) and then plant chicory for the summer. They started at 26 hectares (20 percent of milking platform) and have recently reduced this to 20 hectares (16 percent of milking platform) per year, carrying 10 hectares over each year.

Chicory has deep tap roots which support growth through dry conditions and provide a volume and quality of summer feed to support milk production. The primary purpose of planting chicory was to provide a high-yielding, high-quality summer multi-graze crop that fitted into the rotational grazing system.
A secondary benefit was gained as part of the pasture renewal programme.

The cows graze the chicory during the day, and in the evening are fed grass silage to balance the summer pasture and chicory.

To maintain pasture quality during the summer and increase the amount of feed the cows eat, they pre-graze mow from early-mid September through to mid-October, depending upon the season. They mow half a paddock at a time, so it usually takes two rotations to go around the 48 paddocks on the farm.

The complementary feed sources considered by Corin and Wendy included palm kernel expeller (PKE) and maize. After careful consideration, they opted for PKE which, in their view, gave them certainty of quantity and required minimal outlay – feed trailers with covers are used to reduce wastage.

The reliance on PKE has reduced over time from 245 tonnes in 2012 to 178 tonnes in 2016. During the 2013/2014 drought, the cost per tonne increased by $50 on the day the "drought was declared". That, together with wraps and hay for the winter, resulted in a significant increase in feed costs in that season. Now Corin and Wendy use contracts for a proportion of PKE to be bought at an agreed price each year to achieve a degree of certainty on feed cost.

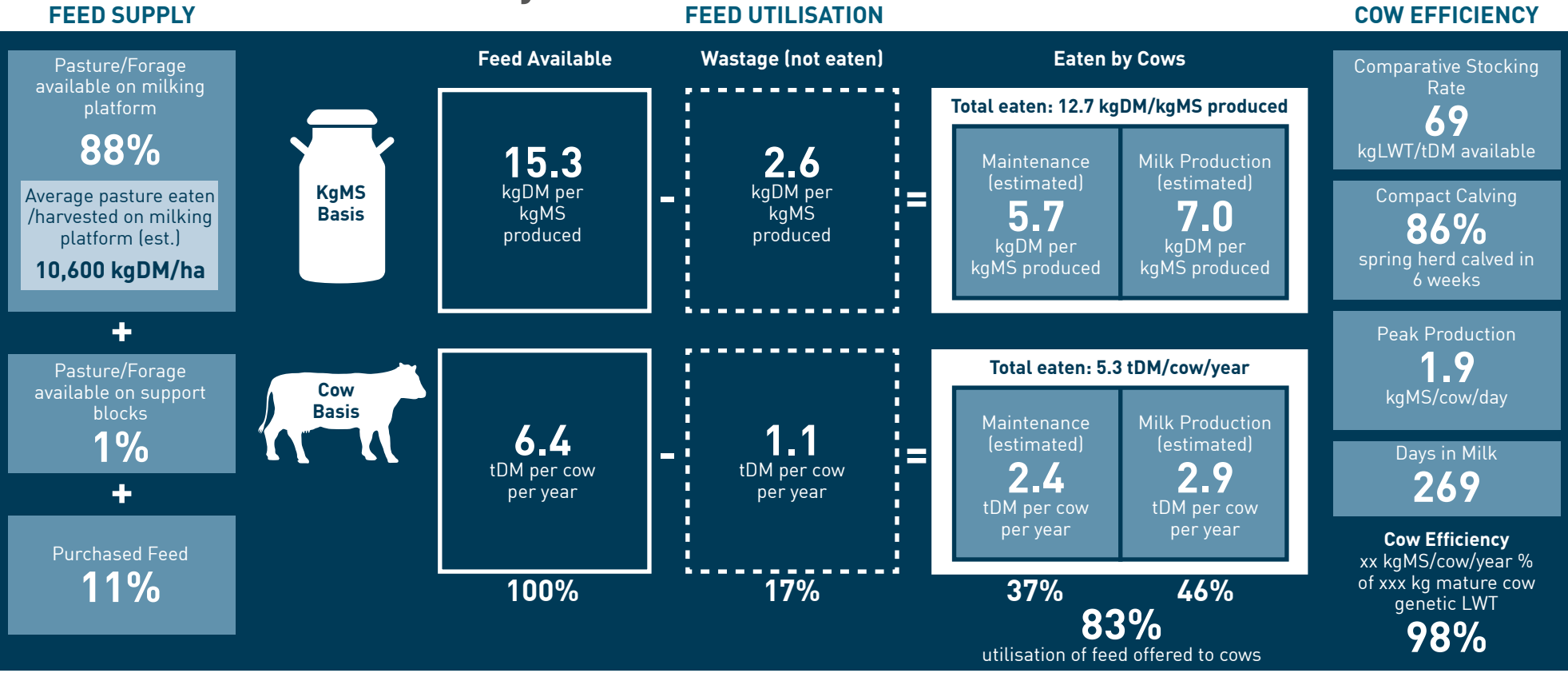
Corin and his team do most of the hay and silage harvesting on the milking platform themselves and use contractors when large machinery is required. The aim is quality feed supply consistently delivered throughout the season. The hay complements pasture over the winter and prepares the cows for calving. The PKE allows the targeted 4 percent of live weight as daily dry matter intake to be achieved. Chicory and silage over the summer maintains milk production through the autumn. The feed grown is generally 88 to 89 percent although this drops back during dry years (such as 2013/2014) to 83 percent and lifts in good seasons (such as 2015/2016) to 90 percent.

Corin and Wendy lease 34 hectares located six kilometres from the home farm and this is where the replacements are grown out. The calves are taken to the lease block when weaned and return home prior to calving as R2 heifers. No feed is brought onto the milking platform from the lease block due to a heavy dominance of Kikuyu there.

Milk production and feed conversion has been relatively consistent – 15 kgDM available/kgMS sold – in spite of some very wet springs and dry summers over the five years of analysis.

Overall, Corin and Wendy have developed an effective and simple feed management system that gives them the greatest possible control over quantity, quality and supply of feed for their farming business.

Feed to milk efficiency 2014/15 season



What does this show?

Feed Supply

The pasture on the milking platform comprises the base of the feed system.

The farm is estimated to grow 13,400kgDM/ha, of which the cows harvest 10,600kgDM. Pasture contributes 76 percent and chicory contributes 12 percent of the feed available on the milking platform. A further 1 percent comes as grazing on support blocks. The purchased feed is 11 percent and is predominantly PKE.

Feed Utilisation

Farm Feed Conversion and Cow Feed Conversion are estimated using a standardised 11 MJ of metabolisable energy per kg of drymatter. The focus is on using the feed resources effectively. By reducing wastage (the amount that is lost through storage and feeding) there is better return because more feed is available to the cow.

It is estimated the cows eat 5.3tDM/year with 17 percent lost to wastage.

If the cow is not fully grown then feed is used for growth ahead of milk production.

Comparative Stocking Rate

The CSR is the starting point to achieve good feed conversion efficiency (100 percent live weight as milksolids) and cow health. The target is in the mid 70s. Corin and Wendy operate consistently in the high 60s to low 70s, this sets the playing field upon which to maximise utilisation, minimise wastage, and convert the feed into saleable product efficiently.

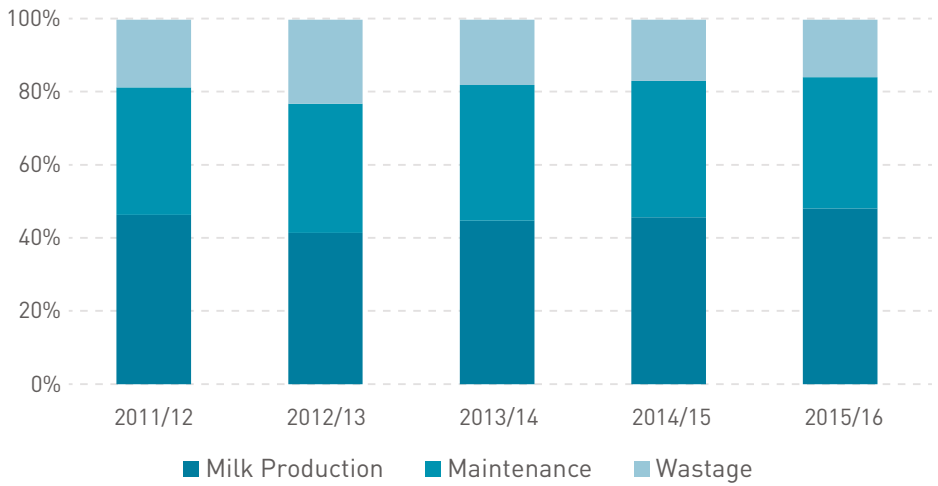
Cow Efficiency

The aim is to maximise the milk production from each cow in terms of milksolids produced per kilogram of mature genetic live weight. A result near or above 100 percent demonstrates good cow efficiency. This is achieved by targeting 4 percent of live weight as dry matter intake for as long as possible over the lactation, which will only be achieved with offering optimum quality feed at all times.

Corin and Wendy consistently deliver at close to 100 percent from their Jersey herd.

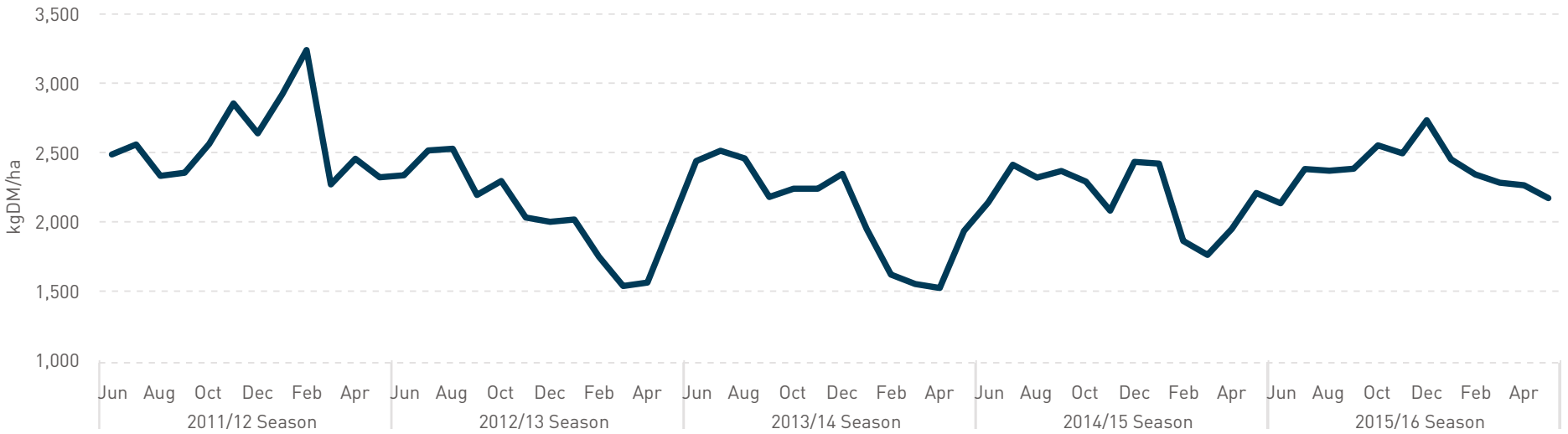
Feed to milk efficiency performance over time

Feed to Milk Efficiency



	Season Ended				
	2012	**2013**	**2014**	**2015**	**2016**
Comparative Stocking Rate kgLWT/tDM available	67	67	71	69	69
Farm Feed Conversion kgDM/kgMS produced	15.1	16.8	15.6	15.3	14.5
Cow Feed Conversion kgDM/kgMS produced	12.3	13.0	12.8	12.7	12.2
Feed Wasted kgDM/kgMS produced	2.8	3.8	2.8	2.6	2.3
Feed Grown % of feed available	88%	89%	83%	89%	90%
Feed Purchased % of feed available	12%	11%	17%	11%	10%

Average Pasture Cover



Impressive cow performance

The Jersey herd fits nicely with the simplicity of the farm system, contour of the land and the Northland climate.

Peak cows milked has decreased by 10 percent from 312 in 2012 to 282 in 2016 and total production has dropped 7 percent from 135,663kgMS in 2012 to 126,849kgMS in 2016. There has been a 3 percent increase in kgMS per cow from 436 in 2012 to 450 in 2016 reflecting the lift in peak production from 1.9 to 2.1 kgMS per cow per day. Generally, peak production is achieved in October with the exception of the 2014/2015 season when it was a month earlier in September.

The production per cow is consistently close to 100 percent of mature cow genetic live weight reflecting the cows efficiency.

Corin and Wendy use herd testing four times a year to assist with their culling decisions. The retention of R2 heifers in the herd as three year olds is excellent at 94 percent. This helps to improve the quality of the herd by enabling the culling of lower performing cows.

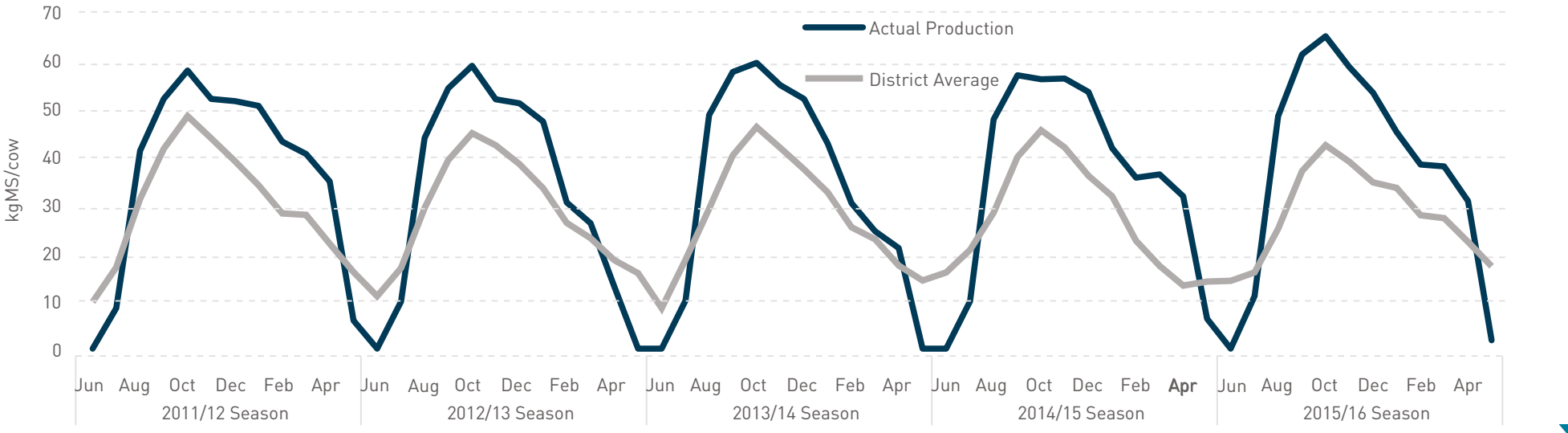
Although overall cow losses are low, the replacement rate at 24 percent is required to offset the high empty rate and to support the ongoing improvement of herd genetics. The high empty rate is partly reflective of the short 9.4 week mating. The planned start of mating is 1 October, to give a planned start for calving of 9 July. The shorter mating period of nine weeks, as compared to twelve weeks on other farms.

However, the benefit is a compact calving period with 62 percent of the herd calved in three weeks and 86 percent calved within six weeks.

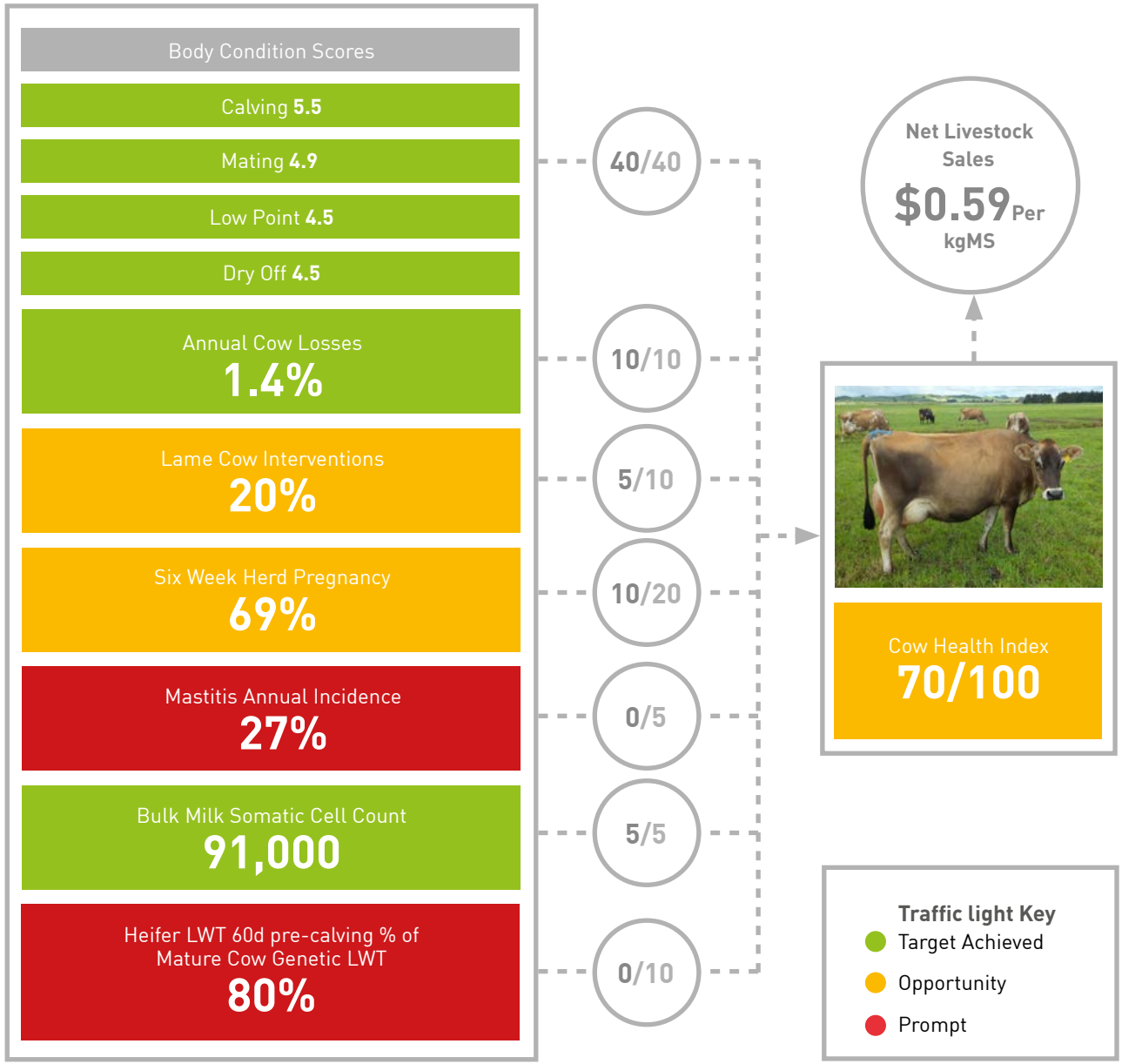
In the past season, Corin and Wendy were disappointed in the empty rate of their cows, and they continue to work with their vet and farm advisor in the areas of lameness, mastitis, young stock growth rates, hypo-calcaemia at calving, all of which can affect both the six-week pregnancy rate and empty percentage. It is important to them to maintain ongoing improvement in herd performance through regeneration of their herd.

The mature cow genetic live weight has increased over the past five years from 425kg to 440kg. As a result, Corin and Wendy have lifted the R2 heifer live weight pre-calving from 350kg to 380kg. They concentrate on growing their heifers well, leading to an excellent survivability of heifers into the herd as three-year-olds at 94 percent.

Monthly Per Cow Milk Solids Production 2011-2016



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 an opportunity to improve and red where performance has been less than desired.

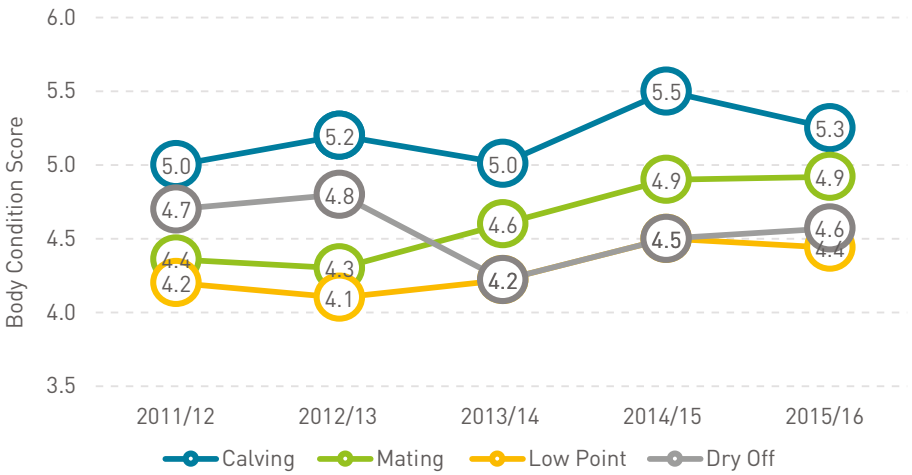
Herd Survivability Metrics

3 year-olds Retention Rate	94%
Replacement Rate at calving	24%
Heifer Mating LWT % Mature Cow LWT	No data
Herd Empty Rate	18%

The three-year old Retention Rate is the number of three-year olds calved this season divided by R2 Heifers calved the previous season to assess retention of heifers within the herd beyond one season. The higher the Retention Rate the better as that demonstrates the investment in raising replacements is delivering a return. The Replacement Rate may be higher or lower depending upon the herd breeding plan and can be influenced by the Empty Rate. On Corin and Wendy's farm they have a shorter mating period (nine weeks) contributing to a higher empty rate.

Animal health performance over time

Animal Health



	Season Ended				
	2012	**2013**	**2014**	**2015**	**2016**
Cow Health Index (Max 100)	70	73	73	70	65
Annual Cow Losses	0%	2%	2%	1%	2%
Lame Cow Interventions	26%	4%	13%	20%	16%
Six Week Herd Pregnancy	70%	69%	68%	69%	66%
Mastitis	8%	13%	19%	27%	20%
BMSCC (000s)	104	89	78	91	78
Heifer LWT 60d pre-calving % of Mature Cow Genetic LWT	82%	82%	82%	80%	86%

What does this show?

The cow condition is held at a consistent level throughout the season. The cows are dried off in good order at BCS 4.2 to 4.8. This means there is not a lot of additional feeding required over the winter to achieve above BCS 5 at calving. The BCS at mating is also good at 4.2 to 4.9. The good condition levels improve the cows' ability to cycle in a difficult wet spring, which has a big impact on mating especially when the mating period is short at 9 to 9.5 weeks. The good cow condition also assists with getting heifers back in calf and the retention of heifers in the herd as 3-year olds is high at 94 percent.

Overall cow losses are exceptionally low reflecting a particular focus on caring for the cows and monitoring their health closely during calving.

Corin and Wendy take a proactive approach to cow health with prompt treatment for mastitis, which is reflected in the high incidence rate and low BMSCC. The relationship between the two has moved over time. In 2012, the number of mastitis cases was 26 with an average BMSCC of 104,000 whereas in 2016 the number of mastitis cases was 58 with an average BMSCC of 78,000. Although seasonal conditions can impact mastitis incidence, ultimately the expectation is for the number of mastitis cases to drop and for the BMSCC to remain low.

The levels of lameness can also vary year-to-year depending in part on the weather conditions in the season.

Also, the effect of theileria* on the R2 heifers is seen in their weight pre-calving down to 80 percent.

** Theileria is a parasitic disease of the blood is transmitted by ticks.*

Environmental

The property is located next to the Wairoa River, which flows into the Kaipara Harbour. The river is fenced off from farmland and is managed by the Northland Regional Council. The contour of the milking platform is flat to rolling with predominately clay, but also peat and sandy soils. Rainfall is approximately 1,145 mm per annum, and the farm can be wet in the winter and dry in the summer.

All 287 cows are spring calved. All adults are largely wintered on the dairy platform with the in-calf heifers returning from the support block one to two months before calving. The main bought-in feed is PKE which is fed in the paddock via trailers.

The effluent area is 23hectares (19 percent of the platform), and effluent is applied with a travelling irrigator to an application depth of 15mm. In April 2012, significant investment was made in the effluent system with the installation of a 90-day storage pond to store effluent during wet periods and maximise the use of the effluent during summer.

Corin and Wendy collect data (including cow numbers, feeding programme, paddock soil testing, fertilizer application, nitrogen application, feed/pasture quality, pasture covers, pasture growth rates, cows events, and effluent application data) that allows a full systems model approach to be adopted when making decisions around feed and crop choices. For example, their soil testing identified parts of the farm with above optimum Olsen Phosphorus levels. This allowed a reduction in fertiliser use with the associated reduction in farm expenditure (and reduction in potential phosphorus loss in sediment to the environment). Pasture monitoring has shown no reduction in performance on these areas.

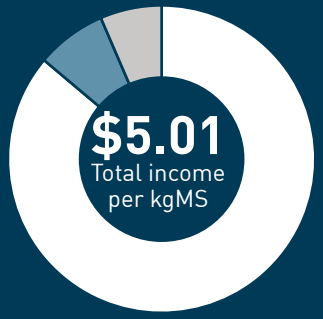
As mentioned earlier, Corin and Wendy also use alternative pasture species – chicory – within the farm system. This allows better pasture and animal performance in summer's dry period.

Nitrogen fertiliser is applied strategically and at low rates, with the outcome being that overall nitrogen use is low.

A key feature of Corin and Wendy's environmental performance is using information and expert advice to support their decision making.

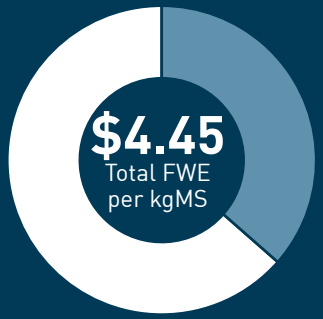
Financial performance 2014/15 season

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	533	$1,858	$4.32
Livestock Trading & Other Income	86	$299	$0.69
Total Income	619	$2,157	$5.01
Feed Costs	175	$608	$1.41
Other FWE	386	$1,346	$3.13
Total FWE	561	$1,954	$4.54
EBITDA	58	$203	$0.47

Breakeven Milk Price
(per kgMS)

What does this show

Corin and Wendy's focus is on the "need to have" rather than the 'nice to have' with decisions considered against their cashflow. Corin and Wendy manage within the bounds of their own levels of financial comfort.

Over the years there has been a steady stream of projects contributing to improved on-farm efficiency and compliance – a new cowshed, a road underpass, upgrade of the effluent system and the purchase of supply shares, altogether worth well over $500,000. All these projects have been funded from cashflow and undertaken with a long-term view on effective use of the land.

They know the importance of measuring actual performance against planned performance. At the start of each year, Corin and Wendy work with their accountant to develop a plan and budget for the year.

At the end of each quarter, they review their performance against the plan.

Although they are fairly self sufficient, there are times when drought hits and feed has to be purchased – this caused a spike in feed cost to $2.08 kgMS in the 2013/2014 season. However, in a usual year the feed costs range from $1.21 kgMS in 2012 to $1.41 kgMS in 2015.

The capital employed per kgMS has not changed significantly from 2012 at $33 to 2015 at $34. However, return on assets fluctuated with the milk price from 4 percent to 7 percent and down to 0 percent.

The Breakeven Milk Price before debt servicing and depreciation was $4.21kgMS in 2012 and is now $3.85kgMS. Understanding each component of the calculation assists in deciding on actions to achieve positive financial performance.

Financial performance over time

	Season Ended			
Financial Efficiency	**2012**	**2013**	**2014**	**2015**
Feed cost per kgMS	$1.21	$1.30	$2.08	$1.41
Other FWE per kgMS	$2.70	$3.25	$3.50	$3.13
Breakeven Milk Price	$4.21	$3.69	$5.11	$3.85
Return On Assets %	4%	4%	7%	0%
Capital employed per kgMS	$33	$41	$40	$34
Milk Price	$6.00	$5.76	$8.21	$4.32

	Season Ended			
Profit and Loss to EBITDA (per kgMS)	**2012**	**2013**	**2014**	**2015**
Milk income	$6.00	$5.76	$8.21	$4.32
Dividends	$0.34	$0.43	$0.27	$0.20
Livestock trading	($0.70)	$0.31	$0.06	$0.37
Other operating income	$0.06	$0.12	$0.13	$0.13
Total income	**$5.69**	**$6.61**	**$8.67**	**$5.01**
Feed costs	$1.21	$1.30	$2.08	$1.41
Other FWE	$2.70	$3.25	$3.50	$3.13
Total FWE	**$3.91**	**$4.54**	**$5.57**	**$4.54**
EBITDA	**$1.78**	**$2.07**	**$3.10**	**$0.47**

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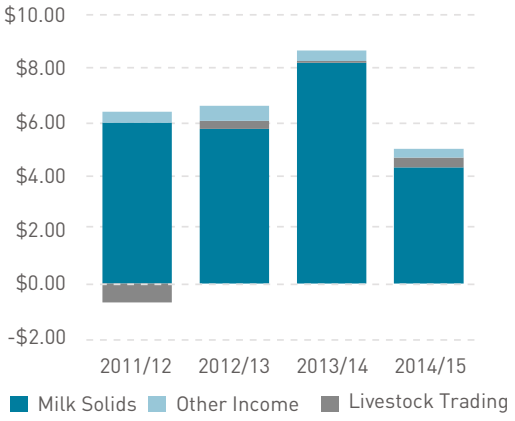
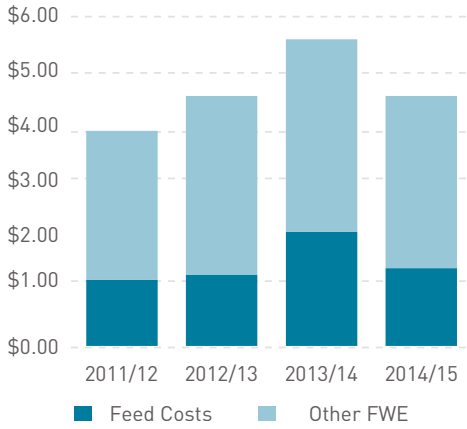
Income per kgMS



Expenses per kgMS



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.

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