Butterworth Enterprises

A performance based system growing into the future

Waikato | Rex & Sharon Butterworth

Farm Systems Change – 2016 Dairy Farm Case Study

Ministry for Primary Industries
Manatū Ahu Matua

Butterworth Enterprises

At a glance

Butterworth Enterprises

“We always fully feed the cows - pasture first, supplements second.“

Rex and Sharon Butterworth farm near Walton in the Waikato with 476 Friesian cows on a 168 hectare property. With the support of a valued long term employee, leveraging a top-level farming system, they produced 234,886kgMS from their effective milking platform of 105.7 hectares in the 2014/15 season. They were runner-up Dairy Business of the Year 2016 and won Best Waikato Farm Performance, a tribute to their commitment of continued learning to further strengthen their farm performance.

Season Ended	Total kgMS	FWE/kgMS
2012	170,176	$3.33
2013	143,902	$3.94
2014	201,328	$3.40
2015	234,886	$3.35
2016	236,309	No data

At a glance – 2014/15 Season

Farm Details

Milking Platform	**113.0 ha**
Dairy support	**55.0 ha**
Total	**168.0 ha**
Effective Milking Platform	**105.7 ha**
Est. kgDM grown (per effective ha/year)	**17,000**
Cows (per effective ha)	**4.5**

Livestock Details

Breed Type	**Friesian**
Peak cows milked	**476**
Production per cow (kgMS)	**493**
Live weight per cow (estimated actual kg)	**498**

Other Details

People working on farm	**2.2**
Peak Production (kgMS/ Cow/Day for top month)	**2.3**
Start of Calving	**8 Jul**
Calved in 6 weeks	**90%**
Average Pasture Cover (kgDM/ha at start of calving)	**2,547**
Production (kgMS/effective ha)	**2,222**

Farming focus

Rex and Sharon Butterworth review areas for improvement across their farming system, identify the changes they need to make, then adapt their management processes to achieve their objectives.

INVESTMENT TO IMPROVE FARMING RESILIENCE

Rex and Sharon wanted to minimise the climatic effects upon their farming business and gain maximum benefit from their existing resources. After assessing the range of options available to them, they invested in two customised feed pads, one in the 2012/2013 season followed by another in the 2013/2014 season.

Read more on Page 5

CHANGING FARM MANAGEMENT

Rex and Sharon recognised that investing in the customised feed pads would require a change to the farming processes. However, they found a key learning is to identify and understand the opportunities that may be captured when making changes. Therefore, based on their learnings, they adapt their farming processes to continually improve performance.

Read more on Page 6

Butterworth Enterprises

A closer look

Investment to improve farming resilience

Rex and Sharon knew they could achieve more because they had great results in good seasons however were not maintaining the performance year-on-year.

They identified the areas where they could improve farm performance and began assessing the options to understand the outcomes from changes to their farm processes. A key objective was to have resilience in profitability by mitigating the impact of climatic conditions on production and the resulting revenue.

Historically, Rex and Sharon protected the pasture during the winter from damage by their cows. Then in the summer the pasture suffered from over grazing by the cows, causing a need to undersow up to 90 percent of the farm which added to the cost of production. They could grow quality feed, both pasture and maize. However neither the pasture nor the maize was delivering the ideal outcome because the feeding process was inefficient.

Rex began investigating the option of building a feed pad as a way to efficiently feed the maize. At the same time an upgrade to the effluent storage was required. However the design was complicated because the farm has a high water table and had an estimated cost of $40,000. As Rex and Sharon developed the plan for building a feed pad to improve the feeding process at a cost of $150,000, the scope of the effluent system requirements increased resulting in an estimated effluent system cost of $200,000. At that point, they stopped and considered the separate solutions for the feed pad and for the effluent system at an estimated total cost of $350,000. Instead, by combining the solutions and building a customised feed pad, which had effluent storage under the feed area and a roof so the rain water could be captured and managed, better outcomes both operationally and financially could be delivered. So that is what they did in the 2012/2013 season at a cost of $500,000.

Rex and Sharon modified the covered feed pad design so the bunkers were 25 percent deeper than the standard and building was longer at 75m. They also covered the ventilated roof with shade cloth so the covered feed pad was cooler (by about 8 degrees) in the summer and warmer in the winter. The slated floor of the covered feed pads allow effluent to be captured in the bunkers below when the cows are feeding. In addition, as the rain water from the roof of the covered feed pads is managed there was approximately 25 percent more effluent storage capacity. Rex and Sharon learned the cows could eat 8kgDM more feed when they can access the right balance of water and shade. An early modification to the water system for the covered feed pads was to increase the water supply pipes from 40mm to 103mm to satisfy cow demand for water. The cows use the covered feed pads extensively during the summer to shelter from the heat. After the morning milking the cows go back to the paddock to graze and rest then about 10.30am go to the covered feed pad to feed and shelter at their leisure until the afternoon milking, thus keeping them out of the heat of the day. AgResearch's Jim Webster explains "Cows are typically more affected by heat than by cold as lactation and rumination generate heat, which can protect against cold, but cause overheating in warm conditions."

Rex and Sharon compared the performance of the cows using the covered feed pad against the cows which were not during 2012/2013 season. They commissioned a feasibility study to validate their own analysis that the cost of $1,875 per cow to build a second customised feed pad would deliver the same benefits. The feasibility study confirmed the analysis and in 2013/2014 it was built, funded by the cashflow from the uplift in the payout and production. Rex and Sharon achieved their three-year targets in the first season.

Changes continue to be made to farm management processes as Rex and Sharon refine the use of the covered feed pads, which have proved to be an effective tool for them.

Changing farm management

Rex and Sharon have concentrated heavily on the transition cow (three weeks prior to calving through to the end of mating), and made that a real focus.

The three key objectives of this process are:
- getting cow condition;
- maintaining cow condition;
- transitioning the cow.

A priority of the feeding regime is to ensure the cows are fully fed every day. Three weeks prior to calving, they begin transition by treating the heifers and cows in the springer mob like milking cows.

Then, between calving and mating, Rex and Sharon have focused on minimising the loss of condition. The 'once-a-day' is a big part of delivering on that goal by milking the colostrum cows once a day for the first week after calving; thereby assisting to maintain cow weight and reduce stress levels for both the cows and the farm team.

To achieve this, they are mindful of how they use their resources. As calving starts on 3 July (brought back from 8 July in earlier seasons), the protection of pasture is important. They manage the round length of pasture to maintain residuals to a target of 1,600kgDM. During the spring, the herd is offered as much pasture as can be afforded, complemented with maize silage and palm kernel extract (PKE). They aim to make 21kgDM per day available for each cow to consume, being allocated between pasture and complementary feed depending upon the stage in the season. Through the spring the focus is on delivering quality pasture to the cows, then during the dry summer period the pasture is protected by feeding the cows at the covered feed pad. Rex knew there was potential for significant improvement in overall results, by avoiding over-grazing, reducing pasture damage and optimising pre and post grazing residuals allowing more pasture to be grown and available to the cows.

Managing pasture quality became an issue in the first season when the covered feed pad was used in the farm system. The cows ate well at the covered feed pad and then wasted pasture because the cows became "fussy eaters". Rex and Sharon began ad hoc pre-graze mowing of their pastures in 2013/2014 to improve pasture quality, cutting the paddock a few hours before the cows began grazing. However, in the 2014/15 and 2015/16 seasons, they committed to a regular pre-graze mowing plan. Once they started, they mowed every day – between 50 percent to 100 percent of the paddock. Rex and Sharon believe this helped deliver the additional 34,000kgMS by ensuring the cows were given quality pasture. In their view, they made no other change – same number of cows and same calving date. The pre-graze mowing is not a tidy-up process rather it is increasing cow intake, ongoing pasture quality and plant production. The key was to cut quality feed for the cows to eat and also maintain quality feed for the next grazing round.

There has been a significant improvement in feed utilisation which is reflected in the reduction of feed wastage from 2.7kgDM/kgMS in 2012 to 0.4kgDM/kgMS in 2016. This improvement has contributed to increasing the milk conversion from 46 percent in 2012 to 55 percent in 2016. Also, the calving date for 2016 and 2017 has come forward to 3 July from 8 July, the improvements made have enabled the lactation length to be extended, at both ends of the season. Overall, the continuing farm wide improvement in performance is making the effort to learn and change worthwhile.

Feed to Milk Efficiency 2014/2015 Season

FEED SUPPLY

Pasture/Forage available on milking platform
56%

Average pasture eaten /harvested on milking platform (est.)
16,600 kgDM/ha

+

Pasture/Forage available on support blocks
29%

+

Purchased Feed
15%

FEED UTILISATION

KgMS Basis

Feed Available		Wastage (not eaten)		Eaten by Cows	
13.2 kgDM per kgMS produced	-	**0.4** kgDM per kgMS produced	=	Total eaten: 12.8 kgDM/kgMS produced	
				Maintenance (estimated) **5.6** kgDM per kgMS produced	Milk Production (estimated) **7.2** kgDM per kgMS produced

Cow Basis

Feed Available		Wastage (not eaten)		Eaten by Cows	
6.2 tDM per cow per year	-	**0.2** tDM per cow per year	=	Total eaten: 6.0 tDM/cow/year	
				Maintenance (estimated) **2.6** tDM per cow per year	Milk Production (estimated) **3.4** tDM per cow per year
100%		**3%**		**43%**	**54%**

97%
utilisation of feed offered to cows

COW EFFICIENCY

Comparative Stocking Rate
84
kgLWT/tDM available

Compact Calving
90%
spring herd calved in 6 weeks

Peak Production
2.3
kgMS/cow/day

Days in Milk
278

Cow Efficiency
493 kgMS/cow/year % of 520 kg mature cow genetic LWT
95%

What does this show?

Feed Supply
The pasture/forage available on the milking platform and support blocks provides the foundation of the feed system.

Rex and Sharon's cows eat approximately 16,600 kgDM of pasture grown on the milking platform. The purchased feed of 15 percent is palm kernel expeller (PKE). However, Rex prefers not to buy feed to fill the gaps. Instead his focus is on planning ahead and clearly understanding feed demand so the use of home grown feed is optimised.

Feed Utilisation
Farm Feed Conversion and Cow Feed Conversion are estimated using a standard ME of 11.

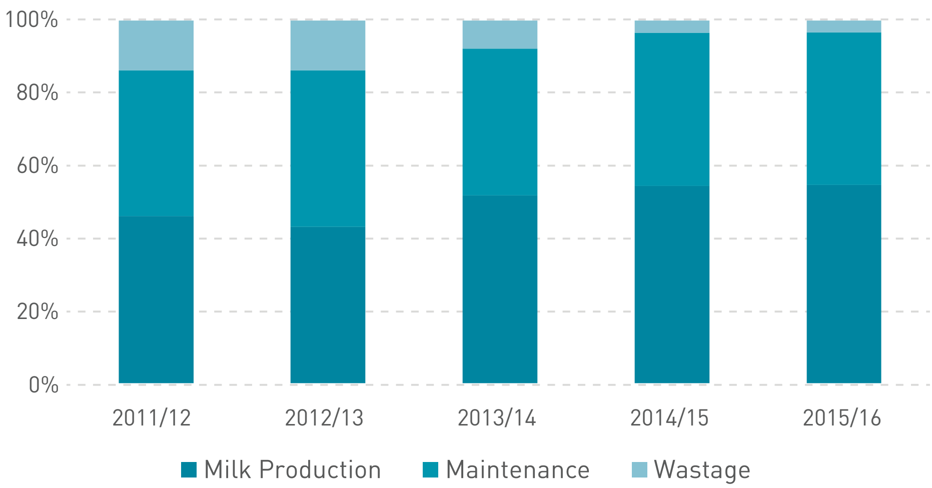
By using the feed resources effectively, the wastage is reduced (the amount that is lost through storage and feeding) and more feed is available to the cow. The estimate of feed eaten by the cow is used for both maintenance and milk production. If the cow is not fully grown then feed is used for growth and then milk production. The primary objectives for Rex and Sharon are care of their land and well-fed cows. The success of their process is evident in the milk production efficiency, which has increased progressively from 46 percent to 54 percent in 2015 and then to 55 percent in 2016.

Cow Efficiency
The aim is to optimise the milk production from each cow. The potential milk production is based on the genetic live weight of a mature cow. A result closer to or greater than 100 percent demonstrates maximisation of cow efficiency, shown above at 95 percent. Rex and Sharon have set their cow efficiency target for the range of 100 percent to 102 percent.

The aim with first calving heifers is to grow them to their full skeletal height by calving. By fully growing out the heifers they are able to mature as they age and maximum cow efficiency can be achieved.

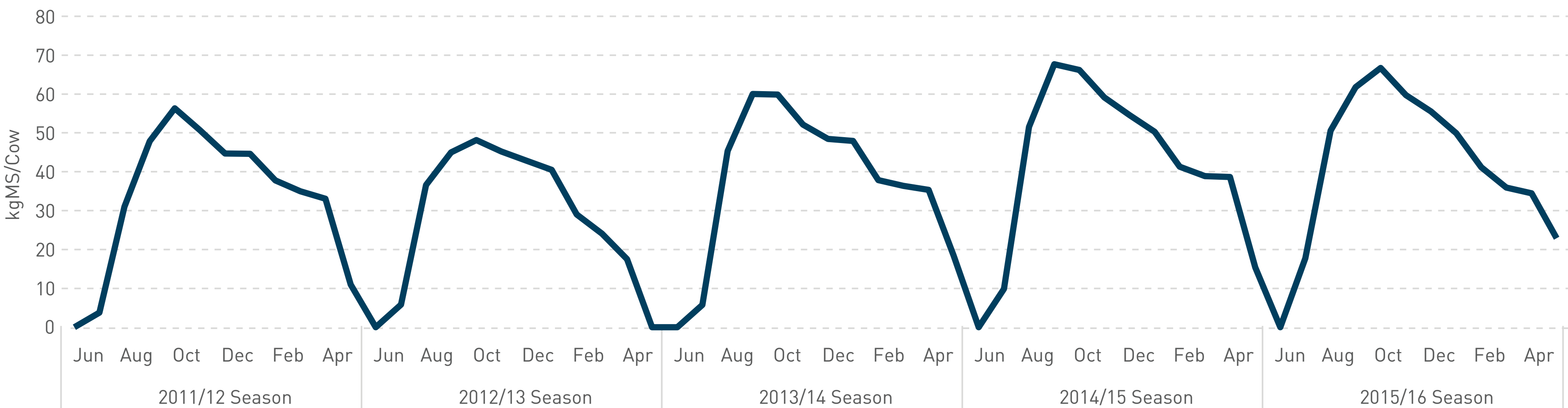
Feed to milk efficiency performance over time

Feed to Milk Efficiency



	Season Ended 2012	2013	2014	2015	2016
Comparative Stocking Rate kgLWT/tDM available	86	95	86	84	84
Farm Feed Conversion kgDM/kgMS produced	15.6	16.7	13.9	13.2	13.1
Cow Feed Conversion kgDM/kgMS produced	12.9	13.8	12.3	12.8	12.7
Feed Wasted kgDM/kgMS produced	2.7	2.9	1.6	0.4	0.4
Feed Grown % of feed available	99%	100%	90%	85%	85%
Feed Purchased % of feed available	1%	0%	10%	15%	15%

Per Cow Milk Solids Production



Animal health 2014/15 season

Body Condition Scores

Calving **5.5**

Mating **4.7**

Low Point **4.4**

Dry Off **4.7**

35/40

Annual Cow Losses
0.4%

10/10

Lame Cow Interventions
2.4%

10/10

Six Week Herd Pregnancy
70%

15/20

Mastitis Annual Incidence
8%

5/5

Bulk Milk Somatic Cell Count
155,000

3/5

Heifer LWT 60d pre-calving % of Mature Cow Genetic LWT
No data

0/10

Net Livestock Sales
$0.47
Per kgMS

Cow Health Index
78/100

Traffic light Key

- Target Achieved
- Opportunity
- Prompt

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.

Rex doesn't use the Six Week Herd Pregnancy metric. He pregnancy tests once at eight weeks and focuses on actual calving aiming to calve most of the herd in six weeks and minimise late calving. In 2016/2017 94 percent of the herd calved in six weeks.

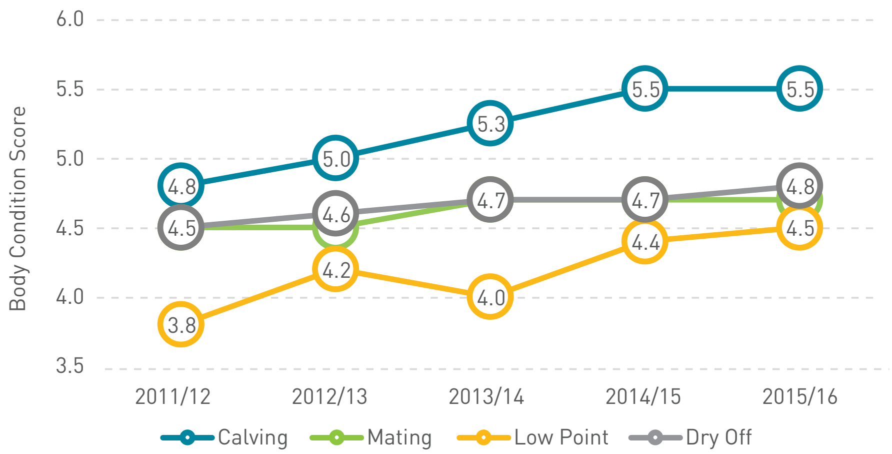
Herd Survivability Metrics

3 year-olds Retention Rate	88%
Replacement Rate at calving	15%
Heifer Mating LWT % Mature Cow LWT	No data
Herd Empty Rate	8%

Rex and Sharon focus on bringing the heifers into the milking herd with as little stress as possible. As part of their transition approach, they prepare the heifers and cows for calving by using the covered feed pads and taking the mobs through the milking shed during the dry off period so the heifers learn the regular farming patterns before calving.

Animal health performance over time

Animal Health



	Season Ended				
	2012	2013	2014	2015	2016
Cow Health Index (Max 100)	71	83	78	78	88
Annual Cow Losses	0.7%	0.5%	0.7%	0.4%	0.6%
Lame Cow Interventions	2.5%	2.3%	2.2%	2.4%	5.8%
Six Week Herd Pregnancy	80%	80%	76%	70%	75%
Mastitis	12%	5%	6%	8%	9%
BMSCC (000s)	130	188	154	155	176
Heifer LWT 60d pre-calving % of Mature Cow Genetic LWT	No data	No data	No data	No data	No data

What does this show?

The body condition scores have progressively lifted across the five seasons as the benefits of achieving consistent feeding and the transition cow programme has gained momentum.

The cow losses, lame cow interventions and mastitis levels are all consistently low. These results confirm the attention to animal health and proactive management of cow wellbeing.

Historically Rex and Sharon had an empty rate of 4 percent to 5 percent. However, this lifted to 8 percent when they purchased the cows and the dairy support land as a package. Now almost all the cows purchased with the dairy support land have been culled and the empty rate has begun to drop. The target of 6 percent has been achieved without using Controlled Internal Drug Release to assist mating, with an 11 week mating period. By pulling the bull out 3 days earlier each season the plan is to calve over 10 weeks.

Although the level of mastitis is low the BMSCC has increased and this reflects the retention of older cows which deliver high production but unfortunately with a higher somatic cell count. Therefore, the focus now is on having the discipline to cull older cows. During the 2015/2016 season a number of cows and heifers suffered from eczema which also contributed to the increase in the somatic cell counts.

In the earlier years there was potential to improve the growth of the heifer calves through to R2. Changes to the management of the heifers and consistent feeding through all seasons has enabled Rex to progressively increase the live weight of both his heifer replacements and his cows. The average cow live weight has increased from 462kg in 2012 to 501kg in 2016.

Environmental performance

The property is located in the Waikato, east of Hamilton, within the Environment Waikato Waihou Management Zone. The contour of the milking platform is flat with volcanic and gley soils. Rainfall is 1,200mm per annum, and the farm can be dry in the summer.

All cows are spring calved and young stock are grazed off the property on the dairy support land. Half the cows are wintered on the dairy support land. The majority of feed comes from the dairy support land in the form of maize and pasture silage, some maize is also grown on the milking platform. PKE is purchased to be fed on the milking platform.

The effluent area is 60 hectares (54 percent of the milking platform), and effluent is captured and stored in the wetter months.

Rex and Sharon use two customised feed pads for their 476-cow herd, protecting soils from winter pugging and resulting in less sediment, pathogen and Phosphorus run-off. They have found pastures have yielded more since the covered feed pads have been in place. The improved pasture performance is a mix of soil protection (less pugging and compaction) in winter, and also reduced overgrazing in the summer. During the hotter months the cows move off the paddocks following grazing and use the covered feed pads. The pasture harvest on this property of in excess of 15-16 tonnes of DM in most years is a reflection of the benefits of pasture protection at critical times.

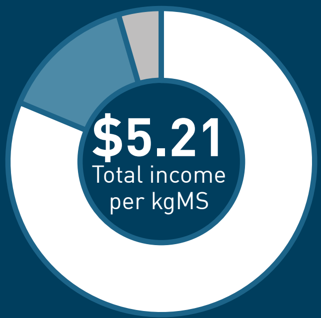
The covered feed pad nutrient and effluent is spread on the dairy support land to optimise the nutrient cycling in the system. The covered feed pad effluent is captured and stored. It is then applied across the 24-26 hectares of maize-growing area, where it is worked into the soil straight away and across 26 hectares of the pasture on the dairy support land using a drip bar and soil injection. The aim is to use this stored effluent effectively to maximise nutrient uptake at optimal times of the year. Maize and silage are grown on the dairy support land and imported back to the milking platform for feeding the herd. Nitrogen is used strategically and applied using the "little and often" principle to minimise the risk of nutrient loss. Use across the non-effluent areas of dairy platform is around 125kg Nitrogen per hectare per year.

Information is power for farmers like Rex, so there is a focus on understanding the volume and composition of effluent being captured in the covered feed pads (weighing pre spreading) in order to gather accurate nutrient loads. The goal is to more accurately place nutrient on the plants for uptake at optimum times. The soils on the dairy support land and milking platform are regularly monitored to check trends.

Rex and Sharon are continually looking for ways to refine and improve their system. They keep up with the latest science and innovative techniques to identify opportunities to make their farm more sustainable and profitable, and a more enjoyable place to be for both the farm team and the cows.

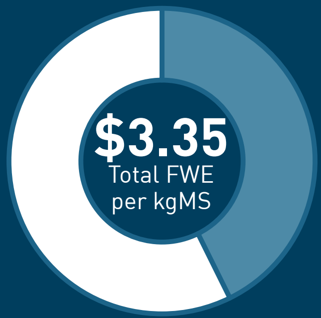
Financial performance 2014/15 season

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	1,026	$2,156	$4.37
Livestock Trading & Other Income	197	$413	$0.84
Total Income	1,223	$2,569	$5.21
Feed Costs	336	$705	$1.43
Other FWE	451	$947	$1.92
Total FWE	787	$1,652	$3.35
EBITDA	436	$917	$1.86

Breakeven Milk Price
(per kgMS)

What does this show

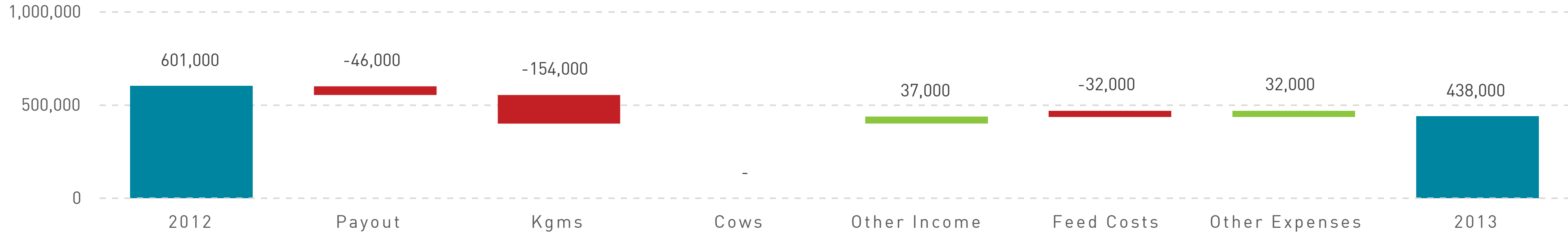
Butterworth Enterprises comprises four entities reflecting the evolution of the farming business as it grows and transitions generations. Rex takes a long term view and effectively manages what he can control. This is evident from the summary of financial performance on the following page. The 'bridges' show other expenses are carefully managed. The feed costs increased with the price of PKE and on-farm harvesting of more maize and silage. The effect from the increase in more cows is less than the effect of the average cow kgMS increasing.

The investment in the customised feed pads was driven by Rex and Sharon seeking to mitigate the risks to their revenue from events beyond their control; primarily the weather which causes damage to pasture. The covered feed pads have enabled Rex and Sharon to manage the cows time on pasture when weather conditions could lead to damage. This has reduced the area of undersowing from 80 hectares to 8 hectares, resulting in a significant saving. In addition, feed utilisation has demonstrably improved reflecting the value from feed being delivered directly to the cows and not wasted.

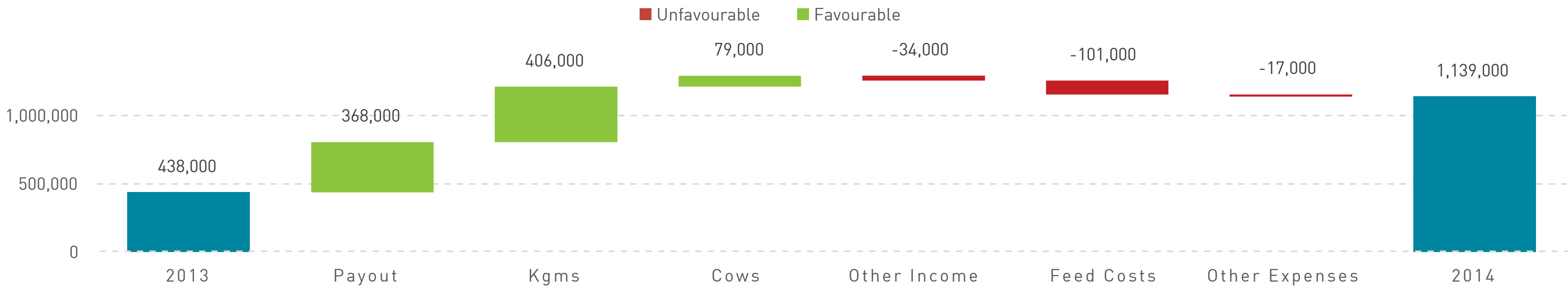
Overall the covered feed pads have enabled Rex and Sharon to maintain and improve their financial performance, seen in the lowering of the breakeven milk price. This is delivered with a 64,710kgMS increase in total milk production from 2011/2012 to 2014/2015, and lifting average production per cow from 396kgMS to 493kgMS. The next step is to reduce cow numbers and maintain the total production at 235,000kgMS.

Financial performance over time

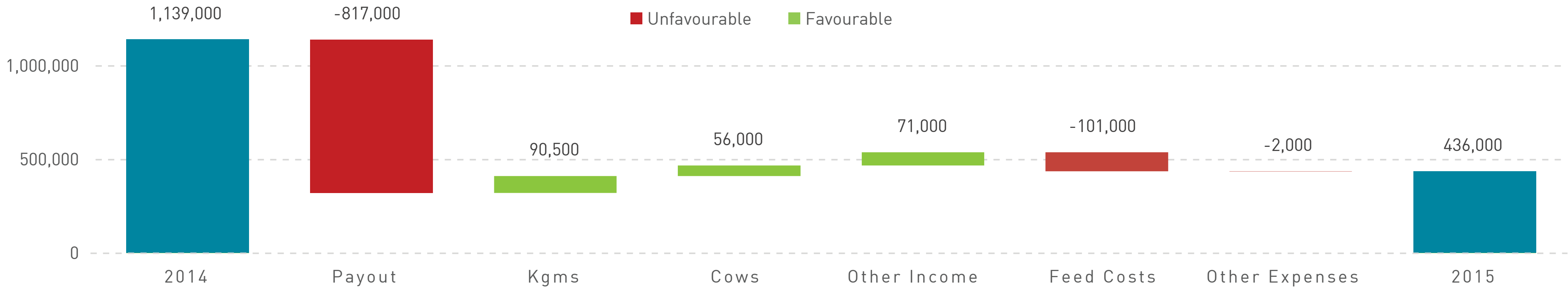
EBITDA $ movement between 2012 & 2013



EBITDA $ movement between 2013 & 2014

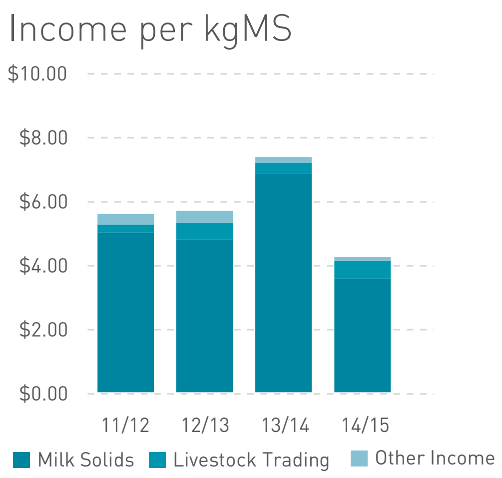


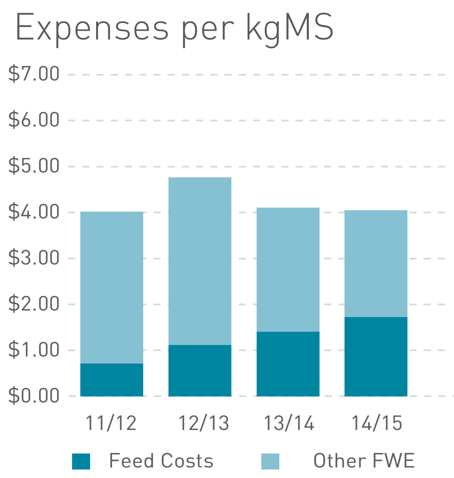
EBITDA $ movement between 2014 & 2015



Financial performance over time

Financial Efficiency	Season Ended 2012	2013	2014	2015
Feed cost per kgMS	$0.60	$0.93	$1.17	$1.43
Other FWE per kgMS	$2.73	$3.01	$2.23	$1.92
Breakeven Milk Price	$2.60	$2.82	$2.77	$2.51
Return On Assets %	5%	3%	9%	3%
Capital employed per kgMS	$63	$79	$58	$52
Milk Price	$6.14	$5.87	$8.43	$4.37





Profit and Loss to EBITDA (per kgMS)	Season Ended 2012	2013	2014	2015
Milk income	$6.14	$5.87	$8.43	$4.37
Dividends	$0.37	$0.45	$0.21	$0.14
Livestock trading	$0.31	$0.65	$0.41	$0.69
Other operating income	$0.05	$0.01	$0.01	$0.01
Total income	**$6.87**	**$6.98**	**$9.06**	**$5.21**
Feed costs	$0.60	$0.93	$1.17	$1.43
Other FWE	$2.73	$3.01	$2.23	$1.92
Total FWE	**$3.33**	**$3.94**	**$3.40**	**$3.35**
EBITDA	**$3.54**	**$3.04**	**$5.66**	**$1.86**

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

Ministry for Primary Industries
Manatū Ahu Matua
PO Box 2526, Wellington 6140
New Zealand
0800 00 83 33
www.mpi.govt.nz

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