Managing farm business

FARM CHANGE THROUGH BENCHMARKING

C. Lewis[1*], K Verhoek[1], I Williams[2]

[1] BakerAg
[2] Pioneer Brand Products

* Corresponding Author:
Chris Lewis
Email chrisl@bakerag.co.nz
Phone +64 6 370 6931
PO Box 900, Masterton, New Zealand.

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Abstract

Benchmarking is the practice of establishing the relative performance of a business against an appropriate standard, which can be self-set targets or peer performance. It identifies the excessive costs and inefficiencies of a business, increasing its competitiveness and ability to outperform others. Dairy System Monitoring (DSM) has been operating for twenty years as a consultancy service that benchmarks over 150 New Zealand and Tasmanian dairy farmers. Its aim is to work alongside farmers, collecting and sharing interpretation of their farm data in a manner that motivates and more actively engages them with their business. DSM participants perform ahead of the New Zealand national average for operating profit as the DSM service enables individuals to verify current performance and make good decisions. It is also a useful analysis tool for consultants. It is used to develop guidelines for managing home-grown forage; continuously update and respond to farm performance information; and critically examine expenditure in-line with physical performance. In conclusion, the DSM service can confirm mainstream science, but it also progresses to the next stage with analysis on profit drivers that create clarity around the strengths and weaknesses of individual businesses, directing performance beyond industry averages.

Keywords: Benchmark, Model, Monitor, Report, Motivate, Learn

Introduction

Top performing farmers have some common traits:

- They benchmark their farm businesses' performance and compare themselves to their peers.
- They actively monitor all aspects of their business, particularly for New Zealand farmers in the areas of pasture production, farm working expenses and cow performance.

- They tend to have a high degree of business acumen.
- They know how to turn feed into milk and meat.
- They produce high yields of home-grown pasture and crop.
- They are information addicts.

Only a few farmers have the complete set of traits and ability to apply these skills. Dairy System Monitoring (DSM) is a farm consultancy service that delivers to the needs of top performing farmers. The DSM service also motivates and coaches' farmers who aspire to be "top farmers". Central to this service is farmers benchmarking themselves against their peers. This enables them to identify and lean on their strengths while improving on their weaknesses.

The type of questions asked of and answered by the DSM service/consultant include: Am I efficient? Do I use my resources as well as my peers? Is my level of profitability competitive? What are my strengths and weaknesses in the farm system? Are there any issues with management and the implementation of the farm system? What are the top performers doing and how are they doing it?

The authors experience has been that when farmers get engaged with DSM, there is increased motivation to achieve, they tend to get the farm team enthused to lift their performance, they feel rewarded for the capture of information, and they are more inclined to ask questions and problem solve. For the consultant, a well-managed benchmarking tool enables greater clarity and specificity around the advice given. The required evidence and basis for recommendations comes from the peer group. Being familiar with the farms participating in the DSM benchmarking service gives the consultant a cluster of farms from which they can build their knowledge, analyse systems, research and test queries.

It has been our experience that DSM generates findings that are aligned with good science, ensuring the advice provided is well-grounded and relevant.

Area Description

Dairy System Monitoring (DSM) was first introduced in 1999 in response to a farmer discussion group in south Wairarapa, New Zealand, who were seeking a fair business comparison to help understand what top performance looked like. It is now a

comprehensive tool used by consultants collecting monthly farm business information from over 150 New Zealand and Tasmanian dairy farmers.

DSM was developed by two New Zealand farm consultancy firms (BakerAg and Macfarlane Rural Business). Farmax, a subsidiary of AgResearch (NZ), maintains a close relationship with this service enabling data transfer from the modelling software to the benchmarking database.

The process for an individual farm begins with a season plan modelled in Farmax by a consultant and the farmer. A farm management input form is completed and submitted before each monthly deadline by the farmer and emailed to the consultant. The consultant enters data from the farm management input form into Farmax and validates the actual performance modelled and reforecasts the remainder of the season, creating a revised position. An upload feature in Farmax transfers the relevant information into the DSM on-line database. Through this database, DSM generates individual farm benchmarking reports for distribution on a prompt monthly basis. A robust standardisation process is embedded in the operation of DSM to ensure a consistent, fair comparison between farms.

The reports generated through the DSM software provides individuals with an up-to-date view of actual performance against planned, and a revised projection of the season outcome for the farm. Physical and financial benchmarking reports give the farmer information on performance relative to peers.

Three critical elements of DSM describe its point of difference:
1. It is transparent. The benchmark reports identify the data with the business names. This is normally restricted within a consultancy firms client group but can be customised across consultancy groups. Rules apply over the use and reporting of individual performance.
2. DSM is a "live" tool. It is for the season in progress. Farmers verify if they are on track with planned outcomes, while looking over the shoulder (digitally) to see how others are performing.
3. It is committed to industry good. Participants agree to the generic information held by DSM being made available for wider industry.

Results

Farmers on DSM have financial performance ahead of the industry standard as published by DairyNZ (2017) (**Figure 1**). **Figure 1** compares the performance of the DSM group of farmers against other NZ dairy farmers as recorded in the DairyNZ Economic Survey 2017.
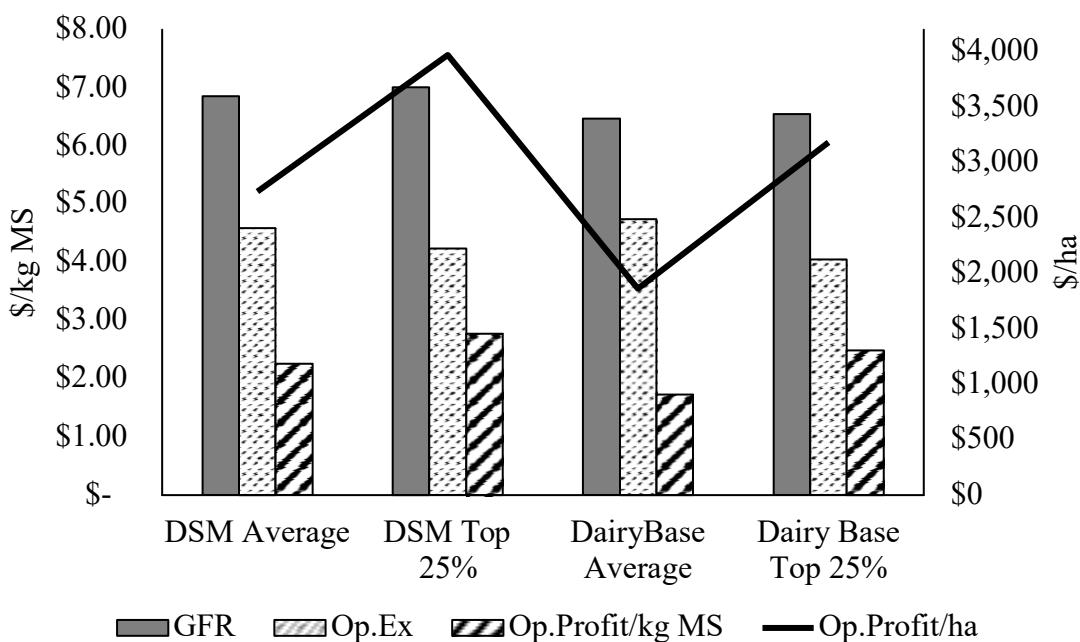

Figure 1. Year 2016-17 DSM farmers vs DairyBase farmers as sourced from the DairyNZ Economic Survey 2016-2017 (DairyNZ, 2017). GFR, gross farm revenue ($/kg MS); Op. Ex, farm operating costs ($/kg MS); Op.Profit/kg MS, farm operating profit ($/kg MS); Op.Profit/ha, farm operating profit ($/ha).

In the 2016-2017 season, DSM participants averaged an operating profit $875/ha higher than the industry standard. For the top 25%, DSM participants were $787/ha higher than industry top 25%. DSM participants are motivated through increased awareness of individual performance and peer group performance.

Table 1 is an extract from the DSM monthly report for individual farm performance.

Table 1: Farm A, DSM report extract on key performance indicators for planned (target outcome) vs monthly revised vs Group Average (the group benchmark) for November 2018.

Farm A	Planned	Monthly Revised	Group Average
Total MS, kg MS	111,000	123,150	N/A
Pasture, t DM/cow	5.00	5.30	5.00
Pasture grown, t DM/ha	14.5	15.4	14.9
Supplements, t DM/ha	1.40	1.40	4.20
Off-farm grazing, t DM/ha	4.40	4.30	4.10
Total Feed t DM/ha	20.3	21.1	23.2
Farm operating cost, $/kg MS	4.68	4.32	4.83
Farm operating cost, $/ha	6,041	6,186	6,264
EBIT, $/ha*	2,602	3,523	2,557

* EBIT is at a milk price of $6.15/kg MS.
EBIT, Earnings Before Interest and Tax, MS, milksolids.

Through the DSM group, high performing businesses tend to set their own benchmarks(planned), and then constantly test if these are being achieved (monthly revised). New Zealand pastoral systems rely on a predominate diet of grazed pasture, but farmers struggle with measuring and determining how much pasture they utilise. DSM helps to answer this question and benchmark performance. For example, in **Table 1**, Farmer A, based on the monthly revised data, can see that pasture production is ahead of expectations by 0.9 t DM/ha. While they had planned to grow 14.5 t pasture DM/ha, they are now tracking towards 15.4 t DM/ha. Farmer A can also see that farm operating cost ($/ha) has marginally increased in absolute terms (+$145/ha), but with higher milksolids forecast, the farm operating cost ($/kg MS) is lower (-0.36). Farmer A is significantly ahead of the group average benchmark in most key performance areas of **Table 1**. Through the monthly DSM report, Farmer A is encouraged that more pasture grown is expected to result in more milk production, at no significant extra cost. The conversion of pasture to milk production is having a positive effect on economic performance of the business (EBIT).

Table 2 is a case study example which tracks the relative performance of Farmer B using five performance indices, and ranks the farm position relative to the total number of farms in the benchmark group.

Table 2. DSM Report ranking Farmer B's position for key performance indices, relative to the total number of farms within the DSM benchmark group, over four years.

	YE 2016	YE 2017	YE 2018	Forecast 2019
Pasture harvest, t DM/ha	28 / 34	29 / 38	19 / 40	10 / 34
Farm operating cost, $/kg MS	34 / 34	32 / 38	34 / 40	3 / 34
EBIT, $/kg MS	34 / 34	30 / 38	22 / 40	4 / 34
MS to LW ratio	28 / 34	36 / 38	23 / 40	13 / 34
Feed cost, $/kg MS	32 / 34	12 / 38	18 / 40	2 / 34
Overall Rank of DSM Group	34 / 34	35 / 38	28 / 40	3 / 34

EBIT, Earning Before Interest and Tax; LW, live weight; MS, milksolids; YE, Year ending

Table 2 demonstrates the change in individual farmer performance over time. In this case, Farmer B recognised poor performance in the year ending (YE) 2016 and consciously worked to improve performance.

The first response of Farmer B was a focus on operating cost reduction, particularly feed costs. This is apparent with lower YE 2017 costs which had lower feed costs due to less supplements used and more pasture harvested. But overall performance in the benchmark group was still described as unsatisfactory for YE2017.

Farmer B then worked to improve the amount of pasture grown through irrigation expansion and maintaining a higher average pasture cover through the season. Supplement use increased , but was more strategic, in regard to quantity, quality and timing of its use. These factors contributed to higher milk production with reduced expenditure per unit of production as demonstrated in YE 2018 with gains in the benchmark group ranking, closer to average rank (i.e. 28/40).

For the forecast YE2019 season, Farmer B has made important gains in the number of days in milk, pasture management and control of non-feed costs. While this is a forecasted rank, provisionally, Farmer B has in four seasons moved from the bottom of the DSM group to potential inclusion in the Top 5.

Farmer B saw value in understanding current performance and used DSM as a means of marking performance to determine if real progress was being made.

For a client who is not performing at or above the group average, there will be the question, "what do I need to do to become a top performer?". The consultant, having a well-summarised, easy to analyse database can precisely answer this question.

Table 3 comes from the DSM 2017-2018 YE Report where the Top 5 farms, on the basis of Earnings Before Interest and Tax (EBIT), are compared to the Middle 5 and the Bottom 5 farms of the DSM group.

Table 3: DSM 2017-2018 YE Report where the top 5 farms (Top 5), on the basis of Earnings Before Interest and Tax (EBIT), are compared to the middle 5 (Middle 5) and the bottom 5 (Bottom 5) farms of the DSM group.

	Top 5	Middle 5	Bottom 5
EBIT, $/ha*	$4,642	$2,714	$961
Farm milking area, ha	232	240	166
No. of cows, cow/ha	3.5	2.8	3.1
EBIT, $/cow	$1,343	$972	$319
Operating Cost, $/kg MS	$4.47	$5.07	$6.34
Feed Cost, $/kg MS	$1.59	$1.78	$1.82
Non-feed cost, $/kg MS	$2.88	$3.28	$4.52
MS, kg MS/cow	464	429	343
MS, kg MS/ha	1,647	1,204	1,068
Pasture and crop yield, t DM/ha	17.8	13.8	12.7
Pasture offered, t DM/cow	5,154	4,928	4,119
Supplement use, t DM/cow	1,871	2,266	1,158
Total DM offered, t DM/cow	7,447	7,862	5,782
Cow LW, kg/ha	1,830	1,472	1,499
Number of DIM, DIM/ha	955	743	779
Number of DIM, DIM/cow	271	264	250
MS to LW ratio, kg MS/kg LW	0.89	0.82	0.72
FCE	16.1	18.4	16.9

* EBIT is at a milk pay-out of $6.75/kg MS, and is the indice used to rank individuals farms within the DSM group as Top 5, Middle 5 and Bottom 5.
DIM, days in milk; DM, dry matter; EBIT, Earnings Before Interest and Tax; FCE, feed conversion efficiency; LW, live weight; MS, milksolids;

From **Table 3** we can identify several traits that characterise our high performers. Those in the Top 5 had more cows per hectare (3.5), higher MS per cow (464 kg MS/cow) which led to a greater production of MS per ha (1,647 kg MS/ha), compared to those ranked in the Middle 5 and Bottom 5 of the DSM group.

The Top 5 had the lowest farm operating costs ($4.47/ha vs. 5.07 vs. 6.34, respectively). When this was further examined, those in the Top 5 had feed costs similar to the Middle 5, but non-feed costs were lower per unit of milk produced **(Table 3)**. High economic performance in pastoral dairy is a function of cost control. This is consistent with the findings of Neal et al. (2018).

A standout difference was the amount of pasture grown. The DSM Top 5 grew 4 to 5 t DM/ha more pasture compared to the other two groups. This is consistent with the findings reported in the DairyNZ Technical Series 2018 (DairyNZ, 2018). Even after you allow for the stocking rate difference, the hierarchy of available pasture per cow is Top 5 > Middle 5 > Bottom 5. This emphasises that pasture yield is a dominate factor for the high performing groups.

Our Top 5 group had less total DM/cow offered cf Middle 5 yet produced more MS per cow. So, feed conversion efficiency was superior in this group compared to the Middle 5. This outcome demonstrates that an important function of management is allocating the right quantity and type of feed to milking cows at the right time.

The Top 5 DSM group had more lactation days (271 vs 264 vs 250 days in milk, respectively), which explains some of the feed conversion efficiency gains.

Supplement use per cow was highest in the Middle 5 group. This supplement was surplus to requirements at various times within the season and leading to substitution. As a result, feed conversion efficiency was poor (FCE 18.4), with an associated higher cost of production, negatively impacting on the Middle 5's operating profit ($EBIT/ha) **(Table 3)**.

The Bottom 5 group had less pasture available per cow, less total feed and shorter lactation lengths. Farmers in this group needed to determine if the amount of pasture grown can increase, otherwise the number of cows per hectare would have to decrease.

DSM consultant advocacy is for stocking rates that are in-line with pasture yield. Taking care with supplement use to ensure the operating costs are consistent with the level of performance.

With DSM, the consultant can advance the interrogation of data to enhance the understanding of farm systems and top performer traits.

In **Figure 2**, farm operating cost ($/ha) and milk production (MS/ha) for the 2017 – 2018 season is shown. Overlining this data is a 'Profit Line' that represents a 'breakeven point'. Expenditure ($/ha) broadly aligns with DairyNZ farm system type, where systems 2/3 are typically represented on the left end of the x-axis and systems 4/5 are on the right. Farms identified by double headed arrow are a selection from the DSM top financial performers.
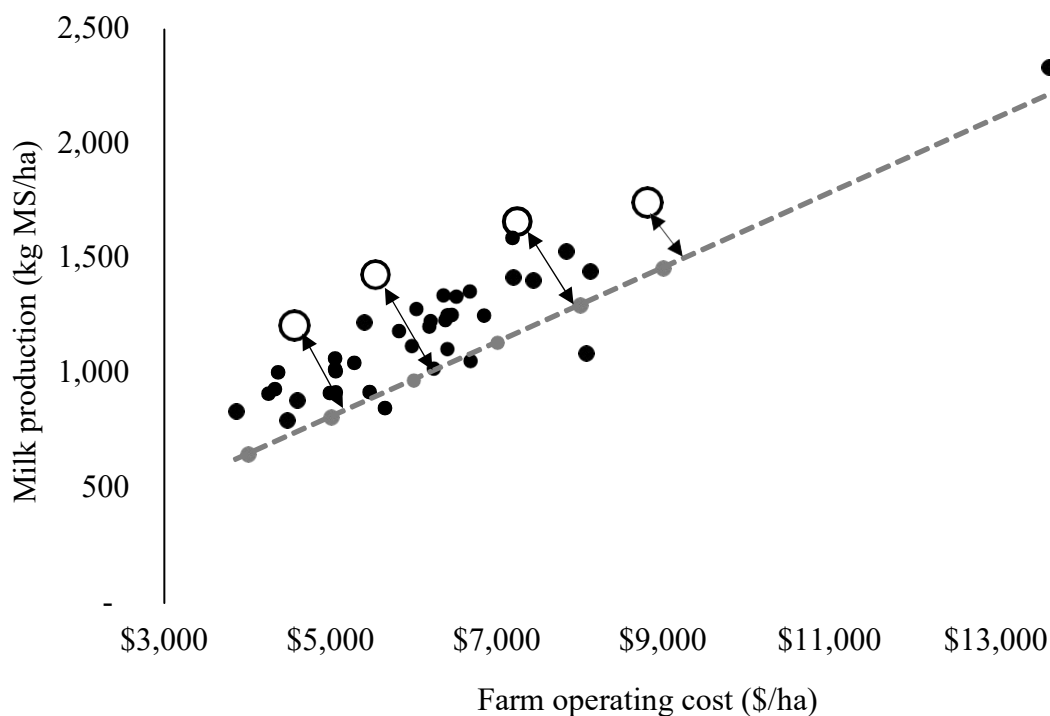

Figure 2: DSM 2017-2018 Year End Report. Milk production (kg MS/ha) versus farm operating costs ($/ha) for farms ($n = 41$) in the DSM benchmarking (as indicated by the solid dots). The dotted line is the 'Profit Line' and is the breakeven point, based on the prevailing milk price, livestock returns and industry standard for debt as reported in the 2016-2017 DairyNZ Economic survey. This is based on $6.75/kg MS for operating profit and $1.20/kg MS for debt. The further a farm is above the dotted line the more profitable the farm is. The farms identified by double headed arrow and open dot are a selection from the DSM top financial performers.

Figure 2 suggests that no single farm system is more profitable than another. This theory has been tested across a range of milk prices and found to hold true against current cost structures within a milk price range of NZ$6 to $7/kg MS. Above this milk price, more intensive farms systems tend to be more profitable, and below $6/kg MS less intensive farm systems have a smaller impact on the operating surplus and are more resilient to milk price variability.

Further analysis of the 2017-2018 season data in DSM has been undertaken to separate feed costs from other farm operating costs; the latter termed "non-feed costs". With this division, we

were able to identify whether an individual farm had to work harder on the control of feed costs, non-feed costs or across both.
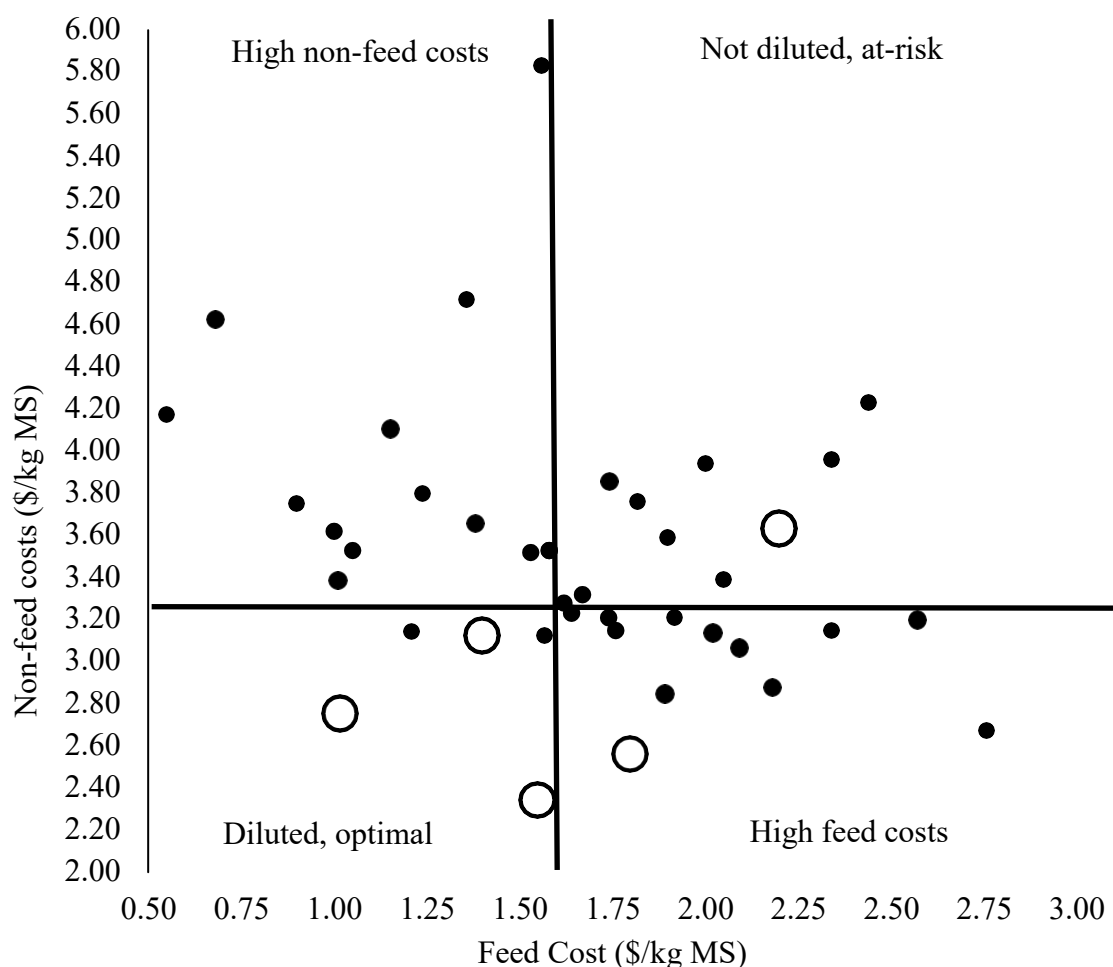

Figure 3. Extract from the DSM 2017-2018 Year End Report showing feed costs ($/kg MS) vs non-feed costs ($/kg MS) for individual farms ($n = 41$) within the DSM benchmark group. Open dots are the Top 5 farms for profitability. Quadrant lines are the average values for feed costs and non-feed costs across the group.

In **Figure 3**, the five farms identified in the larger, dark font are the five highest performing farms for operating profit in the 2017-2018 season. From **Figure 3**, we can identify individual farms in the top left and bottom right quadrants. These farms are advised to review their non-feed and feed costs, respectively. The data suggests excesses in these expense areas. Farmers in the top right quadrant have relatively high expenditure across both expense areas. These farms require a more substantive review of expenditure and/or a review of the farm system employed. Their operating cost may not be in-line with the physical performance.

Farms in the bottom left quadrant of **Figure 3** have a more optimal cost structure. Evidenced by three of the five highest EBIT farms being in this quadrant and one proximate. The Top 5 farm in the top right quadrant has a high production, low margin intensive system. This operator acknowledges containment of expenditure will enhance operating profit and this has become a focus in the 2018-2019 season.

Participants presented with **Figure 3** became very engaged with their relative status and sought more specific feedback. For the 2018-2019 season, participants have asked that their performance be tracked against the 2017-2018 results to determine if they are progressing towards, or into, the optimal bottom left quadrant.

Discussion

The authors believe DSM farmers perform ahead of the industry for economic performance for two reasons. Firstly, it attracts existing top performing farmers because they seek to benchmark their performance. Secondly, DSM also attracts dairy farmers who know they are not meeting their potential and want to learn the pathway towards top performance.

DSM has continued as a service for twenty years because it keeps the monthly data capture simple and the reporting of monthly results prompt and relevant. The DSM consultant maintains a close relationship with the participant; working together to understand the strengths, weaknesses, opportunities and threats associated with the farm's performance, then responding in a timely and specific manner. The unique feature of DSM, which motivates participants, is its "live, in-season" functionality and transparency to peers.

Summary

Dairy System Monitoring is a forum where farmers can fairly compare their business performance against their own targets and their peers. Consultants can use DSM to challenge and motivate clients. With twenty years of data and service to farmers, there is significant value to individuals and the wider industry.

It is the authors' experience that DSM confirms the "truths" that align with good science and motivates farmers to manage their business in accordance.

Farmers that are conscious of their performance relative to targeted outcomes are more likely to make proactive decisions around farm management. Benchmarking with peers in a consistent

and informed manner is rewarding to top performers and supportive for farmers aspiring to be top performers.

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