

Moorepark Dairy Levy Research Update Teagasc Greenfield Open Day 2016

Moorepark Animal & Grassland Research and Innovation Centre

Wednesday 18th May, 2016

Series 30



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Moorepark Dairy Levy Research Update

Teagasc Greenfield Open Day 2016

Animal & Grassland Research
and Innovation Centre,
Kilkenny Greenfield Open Day

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AGRICULTURE AND FOOD DEVELOPMENT AUTHORITY

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Foreword

Patrick O'Meara

AIB Agri Advisor

AIB are delighted to collaborate with Teagasc on this key initiative which is aimed at helping farmers to cope with low milk prices in 2016. Looking ahead, we are all well aware that 2016 will be a challenging year for many in the sector.

Some dairy farmers have already started to experience cashflow pressure and more are likely to do so over the coming months. If you are experiencing, or expect to experience cashflow difficulties, it is important to remember that there are a number of options available to you, and industry stakeholders (*including your local bank manager*) to support you and your farm business through this period of short term difficulty.

Events such as today, are important for the industry and provide an ideal forum in which farmers can share their own experiences and learn from each other. I want to reassure you of our commitment to the sector and I would encourage you to approach AIB at an early stage to see how we can assist you and your family, if support is required. A number of my colleagues are here today, and are available to discuss how best we can support your farming needs.

While the short-term outlook for many of our commodities is less favourable, we maintain a positive medium-to-long term outlook for the sector overall.

Finally, I would like to congratulate all involved in the Greenfield project to-date. I want to thank all **contributors** to this booklet and hope all who attend this open day have an enjoyable and informative experience where you attain some valuable insight which will be of benefit to you and your farming business through 2016.

Introduction

Pat Dillon

Head of Animal & Grassland Research and Innovation Programme, Teagasc, Animal & Grassland Research and Innovation Centre, Moorepark, Fermoy, Co. Cork

The objective of this Open Day is twofold; firstly to update dairy farmers on both physical and financial performance of the Greenfield Dairy Farm over the last seven years; secondly to help guide dairy farmers on how best to cope with the low milk price in 2016.

In 2009, Teagasc in conjunction with key stakeholders (*Irish Farmers Journal, Department of Agriculture, Fisheries and Food, Glanbia, FBD Trust and AIB*) set up the Greenfield Dairy Farm. The objective was to demonstrate the setup, operation and financial performance of a large grass based Greenfield Dairy Farm. Additionally, to identify the risks and demonstrate the risk management strategies associated with dairy expansion. The project is now in its 7th year and the main outcomes for the first seven years of the project are:

- Dairy expansion can be time consuming & adds severe workload if not carefully planned - seek help & advice
- In the short term prioritise investment towards areas of maximum return- cows, grazing infrastructure and soil fertility
- Cash flow management during conversion & during the initial years of production is critical to the success
- Herd performance can be sub-optimal in the initial years; however will increase with the use of high EBI genetics and increase grass production and utilisation
- Seek healthy high EBI dairy stock from herds with a proven herd health history; have a vaccination plan
- Highly skilled staff is crucial in operating an efficient large scale dairy farm

Irish milk prices have become increasingly volatile in recent years due to global market turbulence arising from tight supply/demand conditions; this is likely to continue into the future. This requires a resilient system of milk production i.e. a low cost base to insulate the business from price shocks and allow family based farms to generate sufficient funds in higher milk price times to meet family commitments and finance expansion.

Additionally, the system must have sufficient tactical flexibility to overcome unanticipated events that can lower short term profitability (*e.g. cold wet spring etc.*). The following are the key components of resilient dairy systems:

- High EBI genetics: Herd must be both productive and fertile
- High grass production and utilisation per hectare: Farm profitability (€/ha) is closely linked to the quantity of grass utilised per hectare (tonnes DM/ha).

- Resource efficient and sustainable intensification: Dairy farm systems must continue to be highly resource efficient per unit of input while minimising undesirable outcomes (*greenhouse gas emissions*)
- Optimum stocking rate: The optimum stocking rate will depend on the level of grass production (*tonnes DM/ha*); a long grazing season with minimal (<500 kg DM) purchased feed supplementation.

The support of all the stakeholders in the project is greatly acknowledged. All information pertaining to the Greenfield Dairy Programme as well as weekly update is available on the Greenfield website at: <http://www.greenfielddairy.ie/>.

The Greenfield Dairy Farm - Financial Update May 2016

Laurence Shalloo¹, James O'Loughlin¹, Abigail Ryan¹, Tom Lyng²
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Summary

- A key focus on the Greenfield Dairy Farm is to increase grass growth and to match the overall grass growth with the herd demand in order to produce milk with the lowest cost in a sustainable fashion.
- The high fixed costs on the farm related to full land leasing, labour and bank payments result in overall costs of production that were 37cpl in 2015, but that have dropped from a high of 42cpl in 2014.
- Increasing the resilience of the Greenfield business in the context of volatile milk price is a key driver of strategies on the farm. These strategies include a reduction in the farm base breakeven milk price, the creation of a cash sink fund and participation in the Glanbia fixed milk price schemes.
- In 2016, it is anticipated that the farm will generate a cash deficit that has been identified through the budgetary process; this will be monitored and managed throughout 2016.

Introduction

The Greenfield Dairy Farm is now in its seventh year (*almost half way through the 15 year term*). This is a good opportunity to present how the overall farm has performed over this period and to look forward to the future; in particular to discuss how the farm will deal with the very difficult milk price conditions anticipated for 2016. To start this process it is important to remind ourselves of the circumstances that the farm was set up in 2009. Business plans for this project were put together and refined on a number of occasions between 2007 and 2009. Up to 2009 the plans that were developed were based on a milk price of 28 cpl with an investment of approximately €1.8 million. These plans were dramatically changed as a result of the experiences of 2009 where milk price averaged approximately 23 cpl as well as being a difficult year on heavy soils. As a result of this experience, the business plans were rebuilt based on a milk price of 24 cpl with an overall investment of €1.1 million. The agreement between the three shareholders (*Glanbia, Phelan family and Farmers Journal Trust*) was secured in May 2009 and planning permission was finally secured in November 2009. Between November 2009 and February 2010 all winter housing, slurry storage and milk harvesting facilities were constructed. The farm has been operational since February 2010 with 6 full lactations now complete. This paper describes the farm under a number of headings;

- Farm performance
- Financial performance
- Dealing with price volatility on the Greenfield Dairy Farm
- Managing through 2016

Farm Performance

The original farm business plan for the Greenfield Dairy Farm can be accessed at (<http://www.greenfelddairy.ie/node/103>). The plan was based on minimising capital investment on the farm while expanding cow numbers in order to maximise grass utilisation (Table 1). Cow numbers were projected to increase from 250 in Year 1 (2010) to 350 in Year 10 (2019). Milk solids yield per hectare was projected to increase from 760kg/ha in Year 1 (2010) to 1300kg/ha in Year 10 (2019). Cow numbers (including in calf heifers) on the farm on the first of January were 250 in Year 1 (2010), 307 in Year 2 (2011) 306 in Year 3 (2012), 346 in Year 4 (2013), 332 in Year 5 (2014) and 334 in Year 6 (2015). Milk solids/hectare was 737 kg/ha in Year 1 (2010) and 962 kg/ha in Year 2 (2011), 983 kg/ha in Year 3 (2012), 1,090 kg/ha in Year 4 (2013), 1,079 kg/ha in Year 5 (2014) and 1,089 kg/ha in Year 6 (2015). Grass growth has increased from 12 t DM/ha in 2010 to 13.9 t DM/ha in 2015. However, the farm is prone to drought, which was observed on the farm in 2013 with grass dry matter production running at just over 10 t/ha resulting in a significant deficit in feed supply and adding substantial cost to the overall business (feed costs in 2013 circa €103,000 versus 2014 circa €20,000).

Table 1. Farm level physical projections for the Greenfield Dairy Farm in the original business plan when compared to what was realised in the first six years

Year	Cow Calving no.'s	Grass growth kg/ha	Protein %	Fat %	MS Kg/ha	MS kg
2010 Projected	250	9,205	3.41	3.90	761	91,081
2010 Actual	250	12,000	3.54	4.28	737	83,183
2011 Projected	270	10,386	3.41	3.90	846	101,143
2011 Actual	307	11,383	3.52	4.41	962	108,515
2012 Projected	290	11,667	3.42	3.93	933	111,504
2012 Actual	306	11,800	3.57	4.62	983	110,881
2013 Projected	300	12,462	3.46	3.99	999	119,357
2013 Actual	346	10,027	3.63	4.46	1,090	123,005
2014 Projected	310	13,216	3.48	4.03	1,049	125,393
2014 Actual	332	13,211	3.69	4.67	1,079	121,678
2015 Projected	320	14,059	3.49	4.07	1,101	124,425
2015 Actual	334	13,901	3.87	4.64	1,089	130,626

* Land area has increased in 2014

Financial performance

Over the first six years of this project the farm has performed substantially ahead of what was included in the original budget. This has largely been due to the fact that the milk price in which the farm is operating is substantially better than was originally set out in the budget. Table 2 shows a summary between actual and projected financial performance for the farm over the first six years. The farm has generated substantial profit over the six years. Debt servicing for the farm was based on interest only for the first two years with capital and interest being paid since 2011. One of the key problems for most start up or expanding dairy businesses is around generating positive cash flows in the initial years. While a business may be profitable, this profitability may not result in positive cash flow. However, within the Greenfield Dairy Farm both cash flows and profitability have been positive over the first six years of the project. In the original business plan the farm was not expected to be profitable until year four and in effect the fact that the farm has been profitable from year two, has meant that the accumulated profits are significantly more than was originally considered.

A number of metrics are used in addition to profitability to evaluate the financial performance of the Greenfield Dairy Farm. These include return on investment (ROI) and return on equity (ROE) and overall cash flow. In the Greenfield Dairy Farm, both ROI and ROE calculations are completed for the farm annually and compared to projected figures. On average the ROI for the farm is running at just under 9% when year one is excluded from the calculation which corresponds to approximately 5% above the cost of funds. In relation to ROE, the farm is running at 18% for the years from two to seven. It is anticipated that the return on equity will drop over time as debt is repaid and as the equity proportion of the overall investment increases. Both ROE and ROI returns for the farm to date would compare favourably with an investment that may be made in competing investments off farm.

Table 2. Farm level financial projections for the Greenfield Dairy Farm in the original business plan when compared to what was realised in the first six years

	Year 1 (2010)		Year 2 (2011)		Year 3 (2012)		Year 4 (2013)		Year 5 (2014)		Year 6 (2015)	
	Projected	Actual	Projected	Actual	Projected	Actual	Projected	Actual	Projected	Actual	Projected	Actual
Farm Receipts (€)	380,397	397,949	419,132	567,323	458,657	573,666	490,029	725,910	512,089	690,090	534,140	600,028
Total Costs (€)	387,462	397,831	445,888	537,640	460,015	527,654	454,996	608,626	462,432	593,392	463,984	551,706
Net Profit (€)	-7,066	118	-26,756	81,433	-1,057	45,323	35,034	90,283	49,656	100,898	70,156	69,122
ROI	-	-	-	9	-	6	7	10	7	11	8	8
ROE	-	-	-	23	-	13	10	21	11	21	13	12
Surplus Cash (€)	24,093	47,239	4,403	103,334	30,101	20,155	17,715	97,339	30,156	30,747	48,376	48,884

Dealing with price volatility on the Greenfield Dairy Farm

The Greenfield dairy business seeks to reward all of the resources employed while at the same time generating a substantial return for the shareholders involved in the project over the 15 year life of the project. One key concern centres on the fact that the overall cost structure has been well ahead of what was originally planned which is something that requires careful consideration to ensure that the business is viable even at lower milk prices (*similar to what the industry is experiencing now*). There are a number of key areas where the farm has had substantially higher costs than originally budgeted. These areas include overall farm borrowings, heifer rearing, fertiliser costs, on-going maintenance and development, standoff pad maintenance and bark mulch costs and finally purchased feed requirements. This results in the farm having a relatively high cost of production (37c/l) in 2015 and is therefore exposed to the variances of milk price volatility. This was realised early in the project and a risk management plan was put in place to ensure that the business was viable even a low milk prices. This plan encompasses a whole range of strategies that go to the very ethos of the business and effects all of the decisions made on the farm on both a long and short term basis. The strategies employed can be broken into three main headings reducing the breakeven milk price, managing cash to create a reserve when milk price is poor and availing of the Glanbia fixed milk price schemes.

Breakeven milk price

There has been a focus on the farm to reduce the cash breakeven milk price (*i.e. the base milk price 3.3% P and 3.6% F where all of the cash commitments can be made for the farm including capital repayments*). Over the past number of years, the breakeven milk price has dropped from just over 30c/l (*base price excluding vat @3.3% P and 3.6%F*) to a budgeted breakeven price in 2016 of 24.8c/l (*base price excluding vat @3.3% P and 3.6%F*) and an actual breakeven price in 2015 of just under 24c/l. Below this base milk price, the farm will generate a cash deficit. The factors associated with this reduction can broadly be characterised by three main features;

Reducing costs in a number of key areas

Total costs on the Greenfield Dairy Farm were €537,640, €553,511, €608,626, €593,392, €551,706 in 2011, 2012, 2013, 2014 and 2015, respectively with budgeted costs for 2016 estimated to be €580,674. As can be seen from these numbers there was a big increase in total costs in 2013 driven by in general poor grass growing conditions throughout the year on a farm that had limited soil organic matter and therefore was conducive to drought. There has been a focus on the farm to reduce total costs based on a focus on a number of key aspects of the business and this has resulted in total costs reducing from €608,626 to €551,706 between 2013 and 2015. Even though over this period some of the costs on the farm increased (*e.g. contractor €34,277 to €57,670, veterinary costs €20,417 to €24,206, bank interest €18,000 to €24,000 and land rental €52,998 to €65,446*). There was a focus placed on a number of key areas to reduce costs by maximising the conversion of grass to milk, minimising supplementary feeding, breeding a cow for the system and operating with minimal investment in depreciating assets. Across the

farm there have been areas that have been targeted to reduce costs since 2013 (e.g. purchased concentrate €61,883 to €15,373, purchased forage €42,735 to €2028, contract rearing €71,171 to €68,742, repairs and maintenance €31,634 to €6,086). With some costs increasing but with a major overall reduction in costs on farm from €608,626 to €551,706 there is a reduction in the total costs per litre from 41.4c/l to 37.6c/l or 3.8c/l based on the 2013 milk output.

Increasing stocking rates to match increased grass growth

Over the past number of years there has been a consistent increase in grass growth (except 2013) which has been matched with a consistent increase in the number of cows managed on the farm. This trend will continue as grass growth levels increase from the farm. When compared against the average of the first three years of the business, the farm is now carrying a stocking rate that is 13% higher than was the case at the start of the venture. Virtually this entire higher stocking rate is being facilitated by increased grass growth from the farm. The additional milk sold as a result of the increased stocking rates is helping to reduce the overall costs on the farm. It is however important to note that the benefit from increasing the stocking rate only lasts while the additional stocking rates are being facilitated by increased grass supplies. It is extremely difficult to disentangle the benefits from increasing output from the farm from targeting areas to reduce costs across the farm as a whole.

Increase milk solids concentrations

Milk solids concentrations have increased from 3.54% Protein and 4.28% Fat in Year one of this business to 3.87% Protein and 4.64% Fat by 2015. This was as a result of a strong focus on grassland management and breeding strategies within the herd. This increase in solids is worth 3.4 c/l at a milk price of 29 c/l but even more importantly it is worth 2.8 c/l at a milk price of 23 c/l and has a substantial effect on reducing the milk price point at which the farm still generates a positive cash flow (*breakeven*) and substantially reduces the exposure of the business.

Between the three strategies operated to increase the resilience of the farm there has been a reduction of the breakeven point of the farm of between 6.5 and 7.0 c/l. In effect, the farm would have required a base price of over 30 c/l in 2013 whereas the corresponding figure for 2015 is closer to 23 c/l at 3.3% Protein and 3.6% Fat just to breakeven.

Fixing milk price

The Greenfield Dairy Farm has availed of most (except 2013) of the Glanbia fixed milk price schemes that have been offered. Each year there are different schemes offered by Glanbia based on deals done with customers. The Greenfield Dairy Farm has had different levels of milk locked into the different schemes each year based on availability and the amount of each scheme that was sought. There has been 0%, 15%, 27%, 24%, 25% and 23% locked into the fixed price contract in each year from 2010 to 2015 and there is approximately 23% locked between two fixed price schemes (2014-2017 and 2015-2018) for 2016 (Table 3). Overall in the fixed pricing schemes that the Greenfield Dairy Farm has been locked into, there has been a net benefit of €10,455 up until the end of 2015 and a projected net benefit of

€36,457 at the end of 2016. The net effect in each year has been -€3,891, €10,099, -€15,982, -€2,257, €22,487 for 2011, 2012, 2013, 2014 and 2015 and based on current projections for 2016 it is estimated that net benefit will be €26,003 based on an average manufacturing price of 21.8c/l excluding vat and any share bonus. The schemes that have operated to date while costing money in a high milk price year (*when the farm is in the best position to sustain a cost*), have provided a cushion in years when they are needed (*poor milk price*). It is projected that in 2016 that the fixed price schemes will be worth approximately 1.9 c/l. In the Greenfield Dairy Farm, this scheme has both cushioned the farm in a poor milk price year and has actually increased the overall payout over the six years to the end of 2016.

Managing cash

As there is a return made to all cost resources employed in the Greenfield Dairy Farm in Kilkenny, the farm has a relatively high cost of production. Total costs per litre in 2015 were just over 37 c/l. While as previously mentioned, there has been considerable movement on reducing the breakeven base price from over 30 c/l to where it currently stands, there was also a requirement to generate a reserve or sink fund for the farm to deal with milk prices that we are experiencing in years such as 2016. Therefore, when milk price was high in the past a sink fund was created in order for the farm to be in a position to manage reduced milk prices. In 2011 and 2013 there was a combined sink fund of €125,000 created for the farm to help reduce the exposure. This fund has to date been untouched and is there if milk price was to drop further than projected for 2016. The creation of the fund was made possible by a strong focus on cost control and discipline to generate the sink fund and was facilitated by the taxation structure of the Greenfield Dairy Farm (*liable for corporation tax*).

Managing through 2016

At the start of each year a process on the Greenfield Dairy Farm is gone through which involves putting together a detailed budget based on first principles for the farm operation. This occurs between late December and early January and may involve a number of permutations and iterations of the figures based on discussions with the Greenfield Dairy Farm management team. This process uses the most realistic assumptions at the time for inputs across all aspects of the business for the year and includes assumptions around milk price, milk yields, milk solids, grass growth, requirements for supplementary feeds, etc. Generally a prudent approach is taken around this process, thus ensuring that the farm has the scope to outperform the budget each year. This process was completed this year with an assumption that the base milk price received on the farm would be 24 c/l plus vat @ 3.3% Protein and 3.6% Fat based on an average manufacturing price of 21.8 c/l and 23% of the milk price fixed. It is anticipated that there will be 450 kg of concentrate fed to each cow in the herd and that there will be a requirement to purchase approximately 150 t DM of forage. The farm performance projections are based on 335 cows on the farm in June each of which producing approximately 400 kg of milk solids. The assumptions included for 2016 are based on the previous farm performance and by and

large there is little deviation of the projected management for 2016 relative to years of high milk price, albeit the same can be said for the years where the milk price is high (*by and large the system does not deviate*). Table 4 shows the projections for the farm for 2016 based on the above assumptions and it can be seen that based on these assumptions that the farm will have a relatively small negative cash flow (*relative to the size of the farm and the projected milk price*). This budget will be continually updated throughout 2016 and if required remedial action will be taken to reduce the cash deficit. Options include to reduce the stocking rate on the farm, reduce the number of replacement heifers at the contract rearers, reduce the spend on farm maintenance, etc.



Table 3. The effect of fixed milk price schemes as effecting the performance of the Greenfield Dairy Farm

Year	Total Supply (t)	Supply at Base (t)	Supply Fixed (t)	Supply Fixed (t)	Fat (%)	Protein (%)	Base Price c/l	Fixed Price c/l	Diff c/l	Diff €
2011	1,328,654	1,126,142	202,512	15.2	4.41	3.52	38.69	36.77	-1.92	-3,891
2012	1,316,477	958,669	357,808	27.2	4.61	3.57	34.89	37.71	2.82	10,099
2013	1,469,612	1,111,804	357,808	24.4	4.48	3.65	44.25	39.78	-4.47	-15,982
2014	1,413,359	1,062,413	350,946	24.8	4.67	3.69	41.96	41.31	-0.64	-2,257
2015	1,490,829	1,152,251	338,578	22.7	4.64	3.87	32.37	39.01	6.64	22,487
2011-2015	7,018,931	5,411,279	1,607,652	22.9	4.56	3.67	38.46	39.11	0.65	10,455
2016	1,574,097	1,217,264	356,833	22.7	4.64	3.87	28.14	35.44	7.30	26,003
2011-2016	8,593,028	6,628,543	1,964,485	22.9	4.57	3.71	36.58	38.44	1.86	36,457

Table 4. Cash flow and profitability budget for the Greenfield Dairy Farm 2016

Gross output		Farm	€/ha	€/kgMS	Cents/l
Sales	Milk	497,070	4,108	3.65	32.02
	Livestock	78,350	648	0.58	5.05
	Other e.g. Forage sales	0	0	0.00	0.00
Total		575,420	4,756	4.23	37.06
Purchases	Livestock	7,200	60	0.05	0.46
Total		7,200	60	0.05	0.46
Inventory +/-		20,000	165	0.15	1.29
Gross Output		588,220	4,861	4.32	37.89
Variable costs					
Contracting	Silage, hedgecutting, slurry spreading	43,230	357	0.32	2.78
AI	Straws, technician and breeding costs	14,640	121	0.11	0.94
Animal	Tags	1,507	12	0.01	0.10
Bedding	Woodchip, Straw	6,950	57	0.05	0.45
Dairy	Supplies, Milk recording	12,183	101	0.09	0.78
Feed	Forage and concentrate	64,050	529	0.47	4.13
Fertilizers	N.P.K and Lime	51,217	423	0.38	3.30
Grass	Seeds and Sprays	1,646	14	0.01	0.11
Heifer	Feed and contract rearing related costs	76,142	629	0.56	4.90
Levies	Levies	7,298	60	0.05	0.47
Veterinary	All health related costs	24,250	200	0.18	1.56
Total Variable costs		303,113	2,505	2.23	19.52
Gross Margin		285,107	2,356	2.10	18.36
Fixed costs					
Adminstration	Accountancy and consultancy	7,689	64	0.06	0.50
Bank	Fees and Interest	24,422	202	0.18	1.57
Energy	Electricity and Fuel	11,557	96	0.08	0.74
Insurance		5,600	46	0.04	0.36
Labour	All staff related costs	88,048	728	0.65	5.67
Machinery	Running including repairs/maintenance	2,800	23	0.02	0.18
Repairs & Main	General farm	12,000	99	0.09	0.77
Depreciation	Machinery and Buildings	60,000	496	0.44	3.86
Land	Rental and Lease	65,446	541	0.48	4.22
Total Fixed Costs		277,562	2,294	2.04	17.88
Total Costs		580,674	4,799	4.27	37.40
Net Profit		7,546	62	0.06	0.49
Profit before Rent & Bank		97,414	805	0.72	6.27
Taxation		0	0	0.00	0.00
Capital repayments		55,938	462	0.41	3.60
Capital Expenditure		0	0	0.00	0.00
SFP		0	0	0.00	0.00
Capital Inflows		575,420	4,756	4.23	37.06
Cash Outflow		583,812	4,825	4.29	37.60
Cashflow (Exclude)		-8,392	-69	-0.06	-0.54

Conclusion

The Greenfield Dairy Farm has made significant progress in increasing its resilience to price volatility over the past number of years through reducing the farm breakeven base milk price. This focus has resulted in the farm becoming more profitable and has reduced the exposure of the business to price volatility. The focus on the farm will centre on the continued investment in areas that will increase pasture production from the farm and matching the increased grass growth with increased stocking rates, ultimately increasing the farm productivity from grazed grass.



Herd performance update of the Greenfield Dairy Farm (2010-2016)

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Summary

- Milk solids production per cow and per hectare has increased each year over the period 2011 to 2015. Milk solids delivered per cow has increased from 334 kg in 2010 to 400 kg in 2015, while MS/ha has increased from 962 kg/ha to almost 1100 kg/ha during the same period. This is equivalent to a 28% increase in MS production from the farm over this time period.
- Cow survival has increased over the period 2010 to 2015, resulting in lower replacement rates. Culling rates were reduced to 17% in 2015 and replacement rates reduced to 22% in 2016. Cow mortality is running at 1% annually. The average lactation number of the herd is 3.1 lactations /cow.
- Herd fertility is excellent based on using 100% AI for the past 4 years. The actual 6 week calving rate was 81% for 2016. The not-in-calf rate has been decreasing each year (5% in 2015), albeit using a long breeding season to increase the sale value of cull cows. In 2016, 57% of the herd is made up of Jersey cross cows with the remaining made up of Holstein-Friesian and Norwegian Red.
- Cow numbers have increased from 265 purchased cows in 2010 to 347 homebred cows in 2016. From 2016 onwards it will be a closed herd. Since 2015, the herd uses its own stock bulls for the heifers. Cows are served to 100% AI. Purchased vasectomised bulls have been used for the past three years from week-6 of the breeding season. From, 2017 home bred vasectomised will be used; they will be sold after one season.
- Herd health is good. Lameness was an issue in spring 2013 and 2016. There is no mortellaro in the herd; the main problem is bruising and tiny stone damage in wet weather conditions. A total herd health plan has been implemented each year. Calf health is good but there is a high usage of preventative medicine costing €28/replacement heifer calf.
- Cell count was a problem in the early years due to the purchase of high SCC cows; this is now under control with strict management protocol in place.

Herd stocking rate and milk production

The herd was originally assembled from 11 different herds in 2009 and 2010. Since 2011, the herd has been generating its own replacements. The stocking rate and cow numbers on the farm has increased gradually to 2.80 cows/ha in 2016 (an additional 10ha was leased in 2014) (Table 1).

Table 1. Cow numbers and stocking rate 2010 to 2016

Year	Stocking Rate (cows/ha)	Average Cow number
2016	2.80	335
2015	2.73	327
2014	2.74	307
2013	2.83	320
2012	2.60	294
2011	2.61	295
2010	2.35	265

Milk production has increased each year since the farm was established (Table 2). This is as a result of increased cow numbers, better genetics and increased grass utilisation. The total MS production from the farm has increased by 17% since established. Milk solids delivered per cow has increased from 369 kg/cow in 2011 to 400 kg/cow in 2015 (Figure 1). About 30 kg of MS is being fed per calf. Milk solids per hectare is also increasing per year, this is as a result of a higher stocking rate and improved milk solids production per cow. Milk solids percentage has improved yearly (0.60% since 2011). Total kg of fat delivered has increased by 10,895 and the total kg of protein has increased by 11,216 over the period 2011 to 2015. Average concentrates fed per cow is low at 344 kg since 2011; this due to the high inclusion of grass in the diet (>90%) (Table 2).

Table 2. Milk production and composition 2011 to 2015

	2011	2012	2013	2014	2015
Milk price (c/l)	38	36	41	42	35
Milk delivered (litres)	1,328,654	1,316,477	1,469,612	1,413,359	1,490,829
Milk solids % (fat + protein)	7.93	8.18	8.08	8.36	8.51
Milk solids sold (kg)	108,515	110,881	123,005	121,678	130,626
Milk solids sold kg/ha	962	983	1,090	1,079	1,089
Average Cow number	295	294	320	307	328
Milk Solids sold/cow (kg)	368	377	381	395	400
Butter Fat sold (kg)	60,335	62,455	67,819	67,905	71,230
Protein sold (kg)	48,179	48,426	55,185	53,773	59,396
Litres sold /cow	4,504	4,478	4,593	4,604	4,545
Concentrate fed per cow (kg)		307	620	270	180

The farm will continue to increase the milk solids sold per hectare over the next number of years by increasing stocking rate, improved genetics and higher grass utilisation.

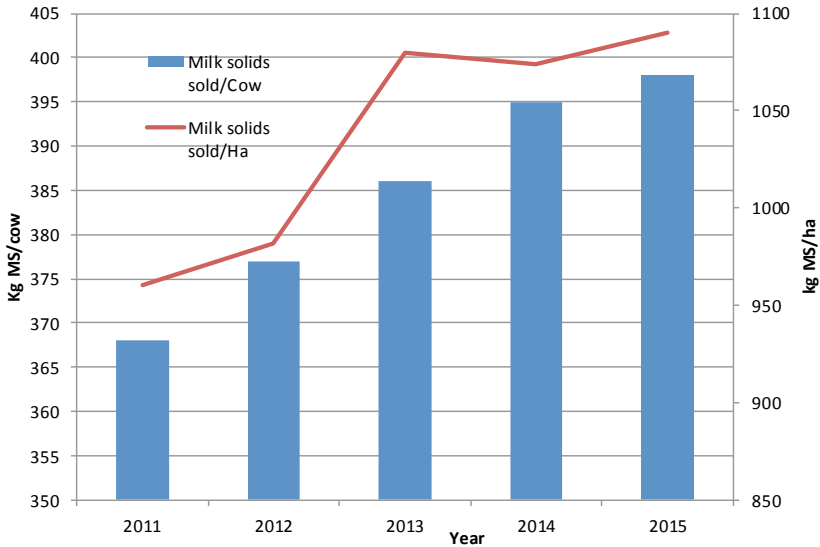


Figure 1. Milk solids production per cow and per hectare from 2011 to 2015

Table 3 shows the performance by lactation number for 2015. First lactation cows are producing 32% less than the mature cows; while second lactation cows are producing 12% less than the older cows. Milk solid concentrations are higher in the younger cows as a result of improved genetics. When planning expansion or a conversion it is worth noting that heifers won't be producing as much as a mature cow.

Table 3. Performance by lactation number in 2015

Lactation	Milk (kg)	Milk fat (kg)	Milk protein (kg)	Milk solids (kg)	Milk fat (%)	Milk protein (%)
1	3,548	169	136	304	4.76	3.82
2	4,749	208	181	389	4.38	3.81
3	5,167	230	195	426	4.46	3.78
4+	5,665	236	206	443	4.17	3.63

Herd structure and breeding policy

The replacement rate has been high since the start of the project in order to increase cow quality. Cow mortality is low for a herd of this size due to excellent stockmanship and herd health. Culls are generally not kept for the winter and are primarily culled due to high somatic cell counts (SCC), lameness and infertility. The cull rate is decreasing each year (Table 4).

Table 4. Replacement and culling rates 2012 to 2016

	2012	2013	2014	2015	2016
Cow numbers calving	306	346	332	334	347
Cow mortality (%)	2%	2%	2%	1%	
Number of 1 st lactation (%)	57 (19%)	116 (34%)	93 (29%)	89 (27%)	75 (22%)
Number of cull cows (%)	72 (24%)	102 (29%)	78 (23%)	58 (17%)	
Number of cows at end of year	233	240	246	272	
Number of in-calf heifers	116	93	89	75	

Each year the AI bulls are selected from the active bull list. From 2010 to 2012; 60-80% of the bulls used were Jersey; these were used on all the Friesian cows in the herd (*Figure 2*). In 2013 and 2014, these crossbred progeny have been crossed back to high EBI Friesian sires. In 2015 and 2016 up to 60% of the AI straws used were Jersey. In 2016 any cows with more than 50% Friesian are served with either Kiwicross or Jersey bull. Each year some of the cows will get a third cross (*Norwegian Red*). These three way cross cows (*Jersey x Friesian x N.Red*) are working well in the herd. There is a strict criteria when selecting AI bulls (1) combined butter fat and protein kgs of +30kgs, (2) good fertility >€120 SI, (3) calving ease on heifers <2%, (4) health (*team must be +*), (5) must have calving ease data on at least 50 daughters. An inbreeding check is carried out each year using the ICBF programme. Sires with shorter gestation are preferred, especially the Hereford AI bulls that are used. In 2016, 45% of the herd is made up of first and second lactation cows; this is a decrease from the early years of the project when 60% of the herd were in lactation 1 and 2. In 2016, 6% of the original cows bought in are still milking on the farm. The average lactation number of the herd is 3.10 lactations /cow, but the herd is still increasing so in time this will increase.

Table 5. Lactation profile of the herd 2012 to 2016 (%)

	Lactation 1	Lactation 2	Lactation 3	Lactation 4	Lactation 5+
2010	43	14	9	13	20
2011	24	33	13	11	20
2012	17	22	31	10	19
2013	32	15	18	21	12
2014	28	28	8	15	20
2015	26	23	23	6	22
2016	22	23	20	18	18

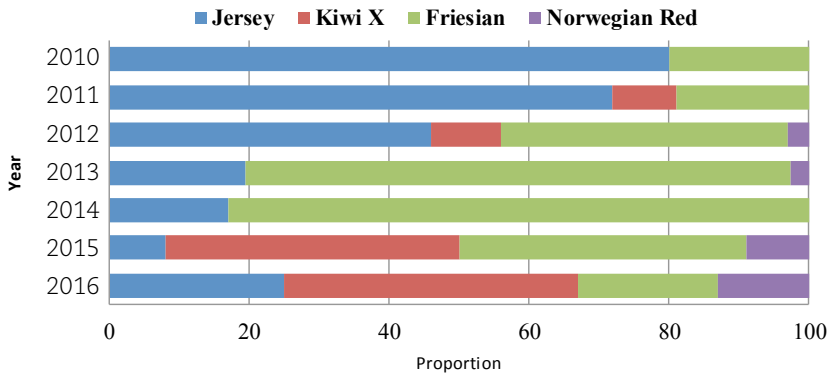


Figure 2. The genotype of AI sires used 2010 to 2016

Figure 2 shows the percentage of each breed used on the herd each year. In the early years, Jersey bulls were mostly used. These cows were crossed to Friesian bulls. In 2015 and 2016, Jersey and Kiwi Cross bulls are being used again. The ideal amount of Jersey in a cow is 50%.

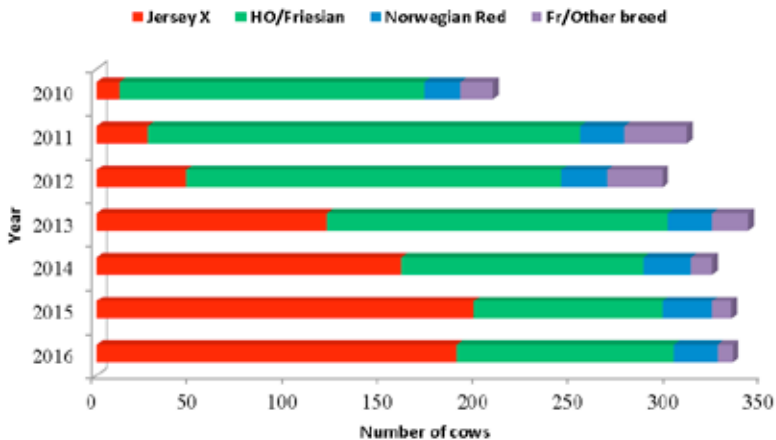


Figure 3. Breed composition of the herd 2010 to 2016

The percentage of Jersey blood in the herd has been increasing since the start of the project. Up to 57% of the herd are now Jersey Cross cows. The extreme Holstein-Friesian cows were not suitable to the system, especially the long walking distances so most have been culled from the herd. Due to the high culling rate during the initial years of the project, the herd is very young with 45% in either 1st or 2nd lactation.

Herd fertility performance

The AI bulls used each year are outlined in Appendix 1. Herd fertility is improving each year and so too is the overall herd EBI. In 2013, the start of calving for the herd was brought forward by one week to improve calving date. A number of management changes were made in 2012 and replicated since then to improve submission rates (*over 80%*), non-return rates and not in calf rates (*decrease of 3%*). The plan is outlined in Appendix 2 and Appendix 3. A decision was made in 2013 to use no stock bull. Vasectomised bulls (4) have been used for the past number of years to aid heat detection. This year eight vasectomised bulls will be used. These have worked really well. They are introduced to the herd on Week 6; as at this stage it gets difficult to observe cows in heat. The same health & safety precautions are required with vasectomised bulls as ordinary stock bulls. They are sent to the factory a few weeks after the breeding season is completed. From 2016 all vasectomised bulls will be home bred. For the past two seasons the farm has used its own stock bulls for the heifers. A decision was made to increase the breeding season by 5 weeks; only because the in calf late calving (*Apr/May*) cows are worth more in-calf.



Table 6. Herd reproductive performance 2011 to 2016

	2011	2012	2013	2014	2015	2016
Expected calving start date	31-Jan	31-Jan	23-Jan	29-Jan	29-Jan	28-Jan
Date when 50% herd is calved		1-Mar	12-Feb	13-Feb	19-Feb	12-Feb
Herd EBI (€)	117	123	144	161	168	171
Mating start date	26-Apr	16-Apr	24-Apr	24-Apr	22-Apr	22-Apr
3 week submission rate (%)		73	78	86	84	
Conception rate to first service (%)		60	60	59	65	
Breeding season length (weeks)	15	12	12	15	17	
Not in calf rate (%)	13	11	10	10	5	
% AI	85	90	100	100	100	
No. first lactation cows	70	57	116	93	89	75

As can be seen from Figure 5, the six-week calving rate of the herd has improved over the period 2012 to 2016. This means that the majority of the calving is in the month of February and higher milk production for both February and March. In 2016 the herd were milked once per day for the first 4 weeks of the calving season to reduce the work pressure. The 6-week calving rate for cows reduced in 2015; this was due to one of the AI bulls used had only 30% conception rate. The risk is now being limited by using a larger team of bulls. There are no cows calving in May as this is very inefficient and frustrating on the managers when breeding and calving are happening at the same time. This year all cows were calved by the mating start date. In 2016, 70% of the herd had calved by the end of February.

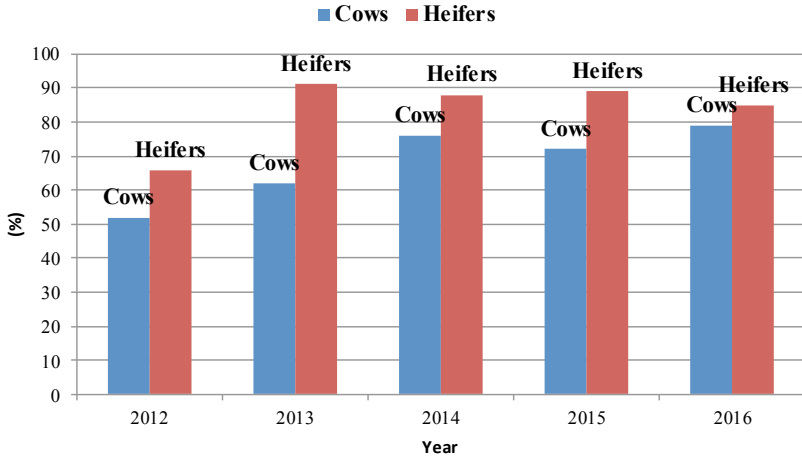


Figure 4. Six week calving rate for both cows and heifers 2012 to 2016

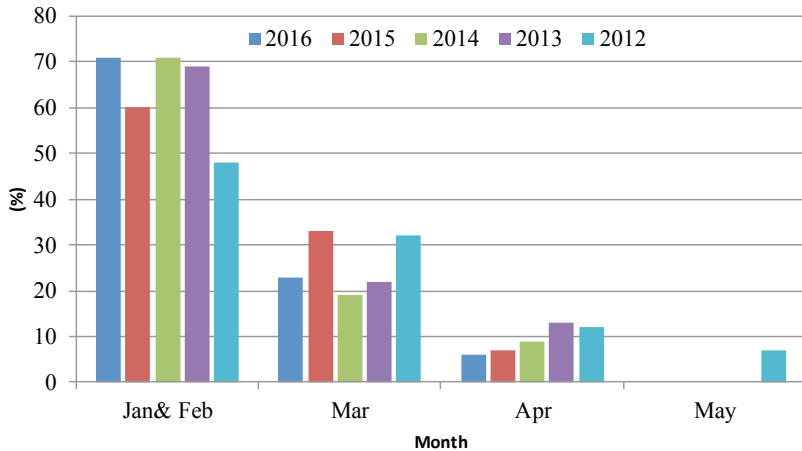


Figure 5. Calving pattern of the herd 2012 to 2016

Each year cows that have not shown signs of heat are scanned before mating start date if they didn't show signs of heat in the three weeks before MSD and if they were more than 30 days calved. These cows may get CIDRS to get them to cycle and back in calf. In 2015, about 10 cows got CIDR's. If cows are scanned and show signs of infection or if they had any trouble calving then they are washed out. If they are very dirty then they will get an antibiotic treatment. There is little or no issues on Greenfield with cysts in cows.

In 2015, the heifers were bred to AI for six days. On day six; unserved heifers get prostaglandin. These heifers will be bred to AI until day 10. The reason for this is to reduce the time needed for heat detection etc. More details can be seen in the fertility section.

Somatic cell count

The single biggest mistake made on the Greenfield when setting up the farm was buying in cows that had a SCC problem. The bacteria causing the problem, Staphylococci aureus, is contagious so transferred from cow to cow mainly during milking. While the SCC never exceeded the penalty level, it has taken a lot of work and effort to keep it under control. Management factors implemented that were successful:

- Teat sealing heifers
- Monthly milk recording
- First milk recording in mid-February
- Treat young cows with high SCC-greater success
- Rigouras CMT testing
- Drying off quarters with consistent high SCC
- Hygiene- clip and clean tails i.e. keep udder clean
- Long dry period for high SCC cows
- Keep high cows in second herd
- Cull repeat offenders

In 2014, a high percentage (20%) of the herd calved down with mastitis. This was very time consuming and frustrating in the milking parlour especially when it was a busy time for calving and calf rearing. The problem was mainly in the first calving heifers. Cows tested very low for SCC in this period. The cows were dry cow tubed and teat sealed at dry off. Obviously, the heifers were not. Heifers are now teat sealed four week prior to expected calving date.

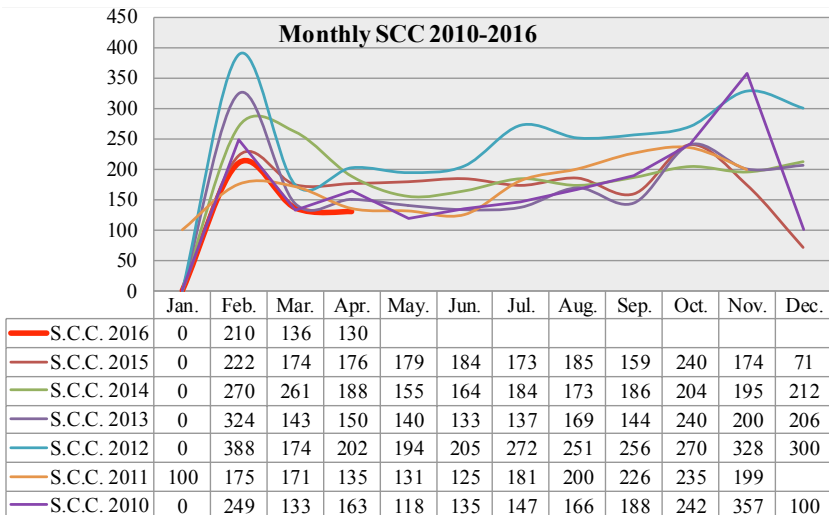


Figure 6. Monthly average SCC each for the Greenfield Dairy Farm from 2010 to 2016

The following didn't work and caused a lot of extra work:

- Cluster dipping- caused hardship and didn't work
- Waiting 10-14 days for milk recording results to come back is too long to be waiting
- Treating chronic cows was not worthwhile

In 2013 and 2014 a lot of heifers were calving down with mastitis. All heifers were teat sealed four weeks before calving in 2016. This was done in batches of 20. It is an easy task but there must be plenty of time and help required. It's the same procedure as treating a cow. Teats must be cleaned thoroughly with clean cotton wool and methylated spirits for each heifer. In Greenfield Dairy Farm they were treated in an ordinary crush with a side gate. The back right leg was put in a hoof wrench and held up tightly so the operator could access the teats. Her head was also held in the head gate of the crush. This meant the operator and animal were safe. It is worth noting that the teat seals were kept in a car with the heaters on during the procedure. This meant it was very easy to get the teat seal into the heifer's teat. Each teat was sprayed with teat dip after the teat seal was inserted. It is also important to teat seal on a mild day. The teat canal will open easier to administer the seal. This has been a really successful way of reducing the cases of mastitis at the calving time.

Herd health

In general the herd health is good on the farm. There is an annual herd health plan put in place for the cows. The annual vaccination plan can be seen in Appendix 4. This is for this farm and is based on the advice of veterinary practitioners. In Table 7 the mortality and cull rate of cows are listed.

Table 7. Culling rates and cow mortality

	2012	2013	2014	2015	2016
Number of cows at start of year	306	346	332	334	347
Number of cows aborted			3 (1%)	-	5 (1%)
Number of high SCC & Lamé		27 (8%)	21 (6%)		
Number of high SCC			14 (4%)	13 (4%)	
Number of lame cows				4 (1%)	
Number of cows culled		15 (4%)			
Number of cows not in-calf		30 (9%)	30 (9%)	14 (4%)	
Number of in-calf cows sold		24 (7%)	8 (2%)	23 (7%)	
Total number of cows sold		96 (28%)	77 (23%)	54 (16%)	
Cow mortality	6 (2%)	7 (2%)	8 (2%)	4 (1%)	

Lameness

Lameness was a problem in the spring of 2013. The increased walking distance for heifers and poor roadway surface led to small stones damaging cows hooves. The excess rainfall of November 2012 washed any topping off the roadways. The foundation on the farm roadways was excellent but the surface had washed away. In 2013, €20,000 was spent to put purchase 'slig' (shale) and roll 2km of roadways. Almost immediately the lameness issue in cows improved. This year there is very little lameness in the herd. The foot bath in the exit yard is topped up daily with bluestone. It is too small for the herd size. It gets dirty quickly and the dirty solids are not able to empty from the foot bath.

Johne's

When the Greenfield herd was assembled the herd was tested for Johne's and all the cows tested ELISA negative. In 2015, cows were all blood tested individually for Johnes disease. All cows tested negative for the disease except for five. These cows had very low levels of Johnes antibodies. After the blood result all the cows were individually dung sampled. These faecal samples were sent to the laboratory where the result was negative for all five. As a precaution these cows were calved separately to the main herd. Their colostrum was not fed to the calves. These calves if kept will be bred to an easy calving beef bull and won't be used for breeding purposes. We will blood test the cows annually for Johnes. Although, this is not a widely practised procedure this is what will be practised on the Greenfield Dairy Farm.

Parasite Control

Cows are faecal sampled about three times per year in Greenfield. For the past three years cows have consistently showed up negative for worms. But, the faecal samples were positive for liver and rumen fluke. Cows are dosed at drying off for liver fluke and rumen fluke. They have not got a worm dose for the past three years. Heifers are treated for fluke and worms from late Spring on the contract rearers farm.

Mineral supplementation

During the grazing season cows are supplemented with minerals through the water system and in the winter with a high spec dry cow mineral on the silage. The Greenfield herd is blood sampled 3 times per year (*April, June and October*). About 10 random cows are blood tested to check the mineral levels. In general they are fine for most minerals. They are generally low for iodine and magnesium in the early part of the year. Last year in mid-season they were abnormally high in copper so the copper was taken out of the mineral system. Magnesium is also put through the water system after cows come off meal. Cows are prone to milk fever every spring on the farm. Cows also get magnesium 2 weeks before they calve to prevent this. About 6% of the herd get milk fever every spring. These cows are given magnesium by the farm manager or the vet. The cow responds quickly to this. But, if not seen in time it is fatal.

Cow management

Cows are condition scored about 3-4 times per year. By the 10-October a batch of cows with a condition score of 2.5 or less are dried off along with any cows calving at the end of January and any cows that would have had a SCC issue during the year. This batch of cows would get 12-14 weeks of a dry period. Cows are dried off in 4-5 batches. If possible this procedure takes place on a dry day. It can take four hours to dry 40 cows with two people to dry and teat seal the cows. This must be done in very clean conditions in the parlour. The teat is cleaned with methylated spirits with a new piece of cotton wool for each cow. She is then tubed with the dry cow tube followed by a teat seal and a spray of teat dip. She is marked and let back to a clean paddock for a few days to dry. After each batch is dried the event is recorded on computer for animal events. Cows that are in poor BCS in Spring are milked once a day. These cows will remain on OAD until at least MSD. In November, cows can rapidly lose condition score due to long walks and wet weather, so it is regularly checked at that stage in the year.

Calf Management

In general calf health is very good. Heifer calves thrive well and achieve all weight targets and mortality is very low. Selling the male calves quickly and getting the heifer calves to the contract rearer reduces the risk of sickness in calves and pressure on the shed and calf rearer. However, it is an area that there is a lot of preventative medical treatment been used. Any sickness in calves increases workload and stress on staff. It also reduces the thrift in calves.

Table 8. Calf Mortality (*abortions are included*)

	2012	2013	2014	2015	2016
Calf Mortality (%)	4	5	6	7.8	6.9

Calf mortality figures include 4-5 abortions per year and still born calves. Calving is becoming more compact and numbers are increasing. But in general, the calf mortality is still okay for a large herd. It was higher in 2015 due to the outbreak of rotavirus.

Colostrum

Almost all calves are stomach tubed at calving especially during the busy period of the first six weeks. They get three litres of 1st biestings within the first hour. After that they will get fed the following morning or evening. If there are only a few calving's then bottle is preferred. The calf is not let suck the cow and is taken straight to the shed. In addition to the vaccines in Appendix 4 the calves are also getting vaccines and doses discussed below.

Pneumonia (RSV and Pi3)

Heifer calves are vaccinated against both RSV and Pi3 which are forms of Pneumonia. This costs about €3.50/calf.

Cryptosporidium

Heifer calves get a daily oral dose of Halicur for seven days to reduce the incidences of cryptosporidium scour outbreaks. This costs about €9/calf.

Coccidiosis

Heifer calves get a preventative oral drench of Vecoxan /Baycox at about 7-10 days of age to prevent coccidiosis blood scour. This costs €1.50/calf.

Rotavirus

Calves go to the contract rearer at 2-3 week of age. In 2015, the biggest problem with calves was the rotavirus outbreak. Luckily, the cows calving from the 17-March were vaccinated. This did reduce the hardship somewhat. But for three weeks a lot of time and energy went into managing sick calves. As a result of this extra time here it put pressure on other areas on the farm. In 2016, all cows that were calving after 1-March were vaccinated. This year there was no scour and calf management was much easier with no sick calves. This is an expensive vaccine (€9/cow).

The cost of treating calves for the above mentioned is approximately €28/ replacement calf and this is not including the IBR vaccine.

Conclusion

The Greenfield Dairy Farm is now half way through the lease. It is improving its output each year and is matching industry key performance targets. All production areas of the farm are been measured. By measuring the grassland production it is easier to know how many cows can be carried on the farm in the future.

Appendix 1. Details of AI sires used on Greenfield Dairy Farm since 2010

Year	AI Bulls Used	No. of each breed used	Total no. AI straws
2016	SPD, PSQ, OKA, JE2047, JE2048, OKT, 511037, SEW, WLY, LWR, FR2207, EKE, ZBR	141 Jersey (25%) 235 Kiwi Cross (42%) 112 Friesian (20%) 75 N. Red (13%)	563
2015	BGJ, BJS, WLY, IGG, SPD, JE2047, APY, OKA, DJB, OKT, EGE, NR2016 – check NR!	46 Jersey (8%) 240 Kiwi Cross (42%) 232 Friesian (41%) 50 N.Red (9%)	568
2014	GZY, JRE, ZBT, GXY, PKA, OKM, WLY, MSF	100 Jersey (17%) 500 Friesian (83%)	646
2013	HJT, OKM, PZS, WDS, WLY, LHZ, BGJ, HYD, JFK	100 Jersey (20%) 400 Friesian (80%) 12 N.Red	500
2012	HYK, MJS, OKM, PKU, TIO, WTL, GFS, HYZ, MOK, TEZ, PSH, VBT, EKE, FEA	212 Jersey (43%) 191 Friesian (39%) 48 Jersey Cross (9%) 14 Norwegian Red 31 Hereford	496/461
2011	BHQ, HWY, HYK, KJW, KTR, PKU, TIO, WFM, BHZ, HZS, MJD, MTW, SIZ, WDS, WNE, UDP, BWU, GIP	389 Jersey (67%) 102 Friesian (18%) 50 Jersey Cross (9%) 29 Hereford 8 Angus	578
2010	ABT, BHQ, HWY, MJS, PKU, BHZ, BYJ, HRJ, HZS, MTW, SIZ, SOK	156 Jersey (80%) 40 Friesian (20%)	196

Appendix 2. Breeding season plan			
Day	Date	To do list heifers	To do list for cows
Fri	1-Apr	Book AI technician for heifers Order Breeding technology e.g. Kaemars, tail paint etc.	Tail painted calved cows (yellow) for pre heat detection. List all cows on heat on prepared breeding charts on the dairy wall.
Sat	2-Apr		Vasectomised bulls need first vaccine IBR
Tues	10-Apr	Organise refresher DIY course	
Mon	20-Apr	Apply heat detection aids. Average weight at bulling was 320kg	291/309 cows had condition score ≥ 2.5 on 3-Apr, remaining were between 2-2.5 and were left on OAD.
Tues	21-Apr	MSD (mating start date) for heifers (95). Remove bulled heifers to separate paddock	
Thur	22-Apr		MSD for cows (330?) Beef AI straw for certain cows such as few slow milkers, a few lame cows, bad SCC cows- all listed on breeding chart
Mon	26-Apr	PG any heifers not yet bred	
Tues	26-30 Apr	Serve heifers to standing heat (10 days AI)	Scan any cows that did show sign of heat and >32 days calved, CIDR + wash out cows (64 scanned, no cysts, 4 dirty, 5 with no CL's that got CIDRS.
	30-Apr	Leave stock bulls run with heifers	
Thur	13-May		Scan any cows calved from 19-Apr(maybe none) that showed no signs of heat Treat cows with CIDR or wash out depending
Thur	24-May		Scan any cows that didn't show signs of heat in past 22 days. 2 were dirty & washed out, 14 were given estrumate even though they had a CL(corpus Leuteum)
Wed	4-Jun		Vasectomised bulls introduced (60% Non-Return Rate)
Mon	25-Jun	Remove bulls from heifers (9 weeks breeding season)	
Wed	2-Jul		Finish Dairy AI on cows
Thur	3-Jul		start using short gestation Hereford AI straws for 3 weeks
Wed	10-Jul		Finish all AI of cows(11 weeks)

Appendix 3. Daily tasks for breeding season

Event	Time	Comments
Breeding Observation-cows yellow tail paint removed	12pm, 9pm, am & pm milking	Little activity at 12pm, plenty at 9pm, tail paint gone next am milking. Noted in heat detection sheet on dairy wall
Drafting of cow with tail paint removed	At am milking	Up to 20 cows served per day
1+2 in charge inseminate If busy get local inseminator	10am	Straw from tank to cow <5min! All insemination products near crush Clear, odourless gel, sterile gloves, paper towel, flask with water @30-35 degrees, scissors, chemise, clean environment Check N levels in tank regular
After each cow is inseminated	10-11am	Apply blue tail paint Write down cow number, AI code & date Record in notebook & breeding chart
After insemination	12pm	Return to paddock
Bi-weekly		Top up cows with tail paint
Weekly	Tuesdays	See if on target for submission rate: e.g. 300/330 in 23 days = 90%.
Unserviced cows	16-May Onwards	Getting difficult to spot cows less activity Repeats at day 42 (target:108=60%Non-Return Rate)
Vasectomised Bulls (8)	16-May	To run with cows Break every 2 nd Day for bulls Feed bulls nuts every day

Appendix 4. 2012 to 2015 vaccination plan

Vaccine	2012	2013	2014	2015
IBR Cows	28-Jun	20-Jun	17-Apr	16-Apr
IBR Heifers (Maiden)	22-Jun	22-Jun	18-Apr	20-May
IBR Calves (3 mths.-live)				
IBR Calves (6 mths. - inactive)	Mid-Apr	Mid-Apr	12-Jun	15-July 31-Dec
Lepto Cows	5-Apr	30-Mar	4-Apr	20-Mar
Lepto Heifers(Maiden)	15-Mar +5-Apr	25-Mar +15-Apr	10-Mar+19-Mar	20-Mar+22-Apr
BVD Cows	5-Apr	30-Mar	4-Apr	20-Mar
BVD Heifers	15-Mar +5-Apr	25-Mar +15-Apr	10-Mar+19-Mar	20-Mar+22-Apr
Salmonella Cows	4-Oct	8-Oct	22-Sept	15-Sept
Salmonella Heifers	Same	25-Sept+9-Oct	22-Sept+13-Oct	14-Sept+13-Oct
Rotavirus Cows *since 2016 it's given in early Jan to cows calving after 1-Mar				28-Feb

Grass DM production and soil fertility update-Greenfield Dairy Farm (2010-2016)

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Summary

- The average grass growth over the last four years was 12.3 tonnes DM/ha; the highest being in 2015 which was 13.9 tonnes/ha. Grass utilisation has been greater than 90% in all years. The increased DM production could be attributed to improving soil organic matter and a change from once per month application of nitrogen to once per week in the main grass growing season.
- In the Greenfield Dairy Farm no defined second cut silage area is harvested. This is because of the high stocking rate, free draining soils and in a low rainfall location. If surplus grass becomes available in the autumn it's harvested as high quality baled silage; otherwise the priority in the autumn is to build a reserve of grass for autumn grazing.
- In 2012, 89% of the farm was at Index 3 and Index 4 for soil Phosphorus. In 2016, only 66% of the farm is at Index 3 and Index 4 in spite of the annual application of 21 kg P/ha. The P off take in 2015 was 16 kg P/ha while P imported was 24 kg/ha.
- Potash soil levels are increasing due to the high annual application of potash (70 kg K/ha); up to 77% of the farm is at Index 3 and Index 4. Soil pH has reduced from 6.48 to 6.11.
- The farm is unique in that all paddocks were sown to monoculture's grasses with white clover. Tyrella is the most consistent cultivar on the farm. White clover makes a valuable contribution to both grass production and grass quality.

Grass production

Grass production was 11.8, 10.0, 13.2 and 13.9 tonnes of DM production for 2012, 2013, 2014 and 2015 respectively (Figure 1). Growth on the farm has been restricted by low soil organic matter content and moisture deficits in recent years. Figure 2 shows the monthly rainfall recorded at the Greenfield 2012 to 2015; yearly total rainfall was 791, 746, 913 and 828 ml for 2012, 2013, 2014 and 2015, respectively. The reduced grass production in 2013 (10 tonnes DM/ha) was associated by the reduced rainfall, especially in July, August and September. However the grass production capacity of the farm is increasing with every grazing season.

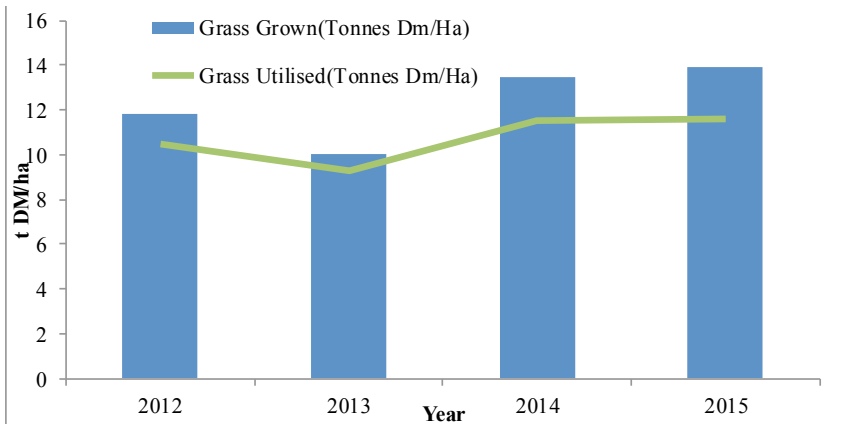


Figure 1. Annual grass production and utilisation 2012 to 2015

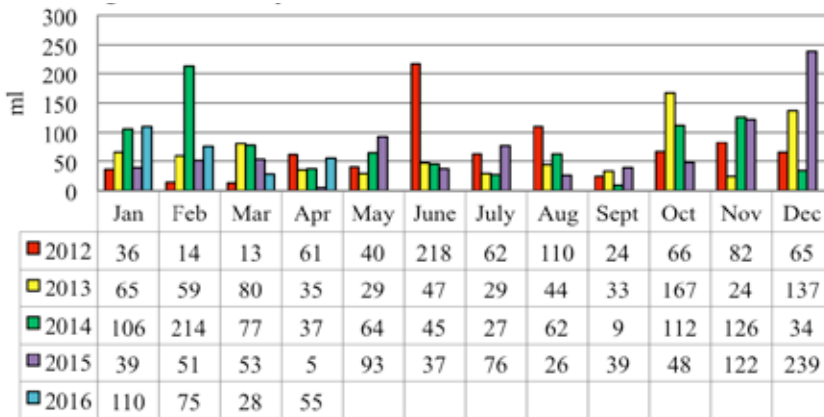


Figure 2. Monthly rainfall Greenfield Farm 2012 to 2016

Grazing management

The key success driver of the Greenfield Dairy Farm is the amount and quality of grass the farm can produce. Each year since 2012 the farm has increased the amount of grass grown per hectare, with the exception of 2013. The Greenfield Dairy Farm has increased its stocking rate since the farm was set up. In 2014, an additional 8 ha was leased next to the parlour. In 2016, the average stocking rate will be around 2.80 cows/ha. Winter feed production has been variable since the start of the project (Table 1). The overall requirement of winter feed is increasing each year due to the increasing stocking rate. In 2015, 273 cows were wintered and all the culls were sold the previous autumn. By early December all the cows are dry and housed on the stand-off pad full time. The cows go to grass immediately post-calving. For the past two years the last of the cows to calves (30-40) have gone to the contract rearer for 4-6 weeks in early January; this helps to reduce pressure on winter feed and the plan is for this to continue. In

2012, 2014 and 2015 the farm was able to grow enough winter feed. In 2013, winter feed was bought in due to the poor grass growth that year. In the spring about 100-120 kg meal is fed per cow. Grass supply is generally tight towards the end of March so high quality bales are kept for the milking cows to increase rotation length. Similarly, in August when building up grass cover, cows usually get high quality bales to increase rotation length for 10 days. For the past two years the area cut for second cut silage has been reduced; when there is surplus grass; it's cut as high quality bale silage. Winter growth is averaging 2.2kgs per day over the past 4 winters.

In terms of day to day grazing practices, cows graze pre-grazing covers of 1,500 kg DM/ha during the main grass growing season in 24 to 36 hour allocations. The post grazing height in the main grass growing season is about 4cm. The farm has never been topped and instead, paddocks are removed as bale silage when the pre-grazing paddock cover exceeds 1,600 kg DM/ha. Each year, approximately 25% of the grazing area is stopped for a large first cut of grass silage.

Table 1. Grassland productivity and winter feed requirements at the Greenfield Dairy Farm (2012 – 2015)

Year	2012	2013	2014	2015
Grass Grown (Tonnes DM/ha)	11.8	10.0	13.5	13.9
Grass Utilised	10.5	9.3	11.5	11.6
Diet from Grass (%)	93	75	94	96
Stocking Rate	2.60	2.83	2.72	2.73
Rainfall (mm)	791	746	930	826
Fertilizer N application (kg /ha)				
Nitrogen	250	250	250	250
Phosphorus	0	16	19	21
Potassium	34	73	88	70
Sulphur	36	40	32	33
Winter Feed Requirements (Tonnes DM/ha)				
Winter Feed Produced	2.13	1.15	1.92	2.5
Winter feed bought	0	2.0	0.5	0.17
Concentrate Feed bought	0.78	1.7	0.5	0.49

Soil Fertility

The farm is soil sampled annually and the farm is in nitrate derogation since 2012. The farm has been allowed spread 30,000 kg N/year and we believe this is definitely reducing grass production especially on a farm that is low in soil organic matter and newly reseeded. Initially, N fertilizer was bulk spread monthly, however this has been changed to weekly spreading since 2013. Since 2013, the farm is getting two rounds of sulphur (33 kg/ha). Potash is mostly applied to grazing ground from July onwards with a small amount applied in the spring; this as a precaution against grass tetany.

Phosphorus

In 2012, 89% of the farm was at Index 3 and Index 4 (Figure 3). Due to the nitrates directive the farm wasn't allowed to spread any phosphorus in 2012, which resulted in further drops in the phosphorus levels. By 2016, 66% of the farm was only in Index 3 and Index 4, in spite of spreading 14kgs of P/ha annually. The phosphorus levels have decreased from 2012 to 2015. But they have increased slightly from 2015 to 2016. Ideally all paddocks would need to be at 7ppm for maximum growth rates (14/30 paddocks are ≥ 7 ppm in 2016). In 2015, 10/30 paddocks were at 7 ppm. Since 2012 the farm is getting 14kg P/ha on average (Table 2). This is been applied to the paddocks low in phosphorus and silage paddocks in Spring. Slurry has also helped to increase the phosphorus levels. It is applied on grazing paddocks in the spring time. The paddocks low in P will get another application in August.

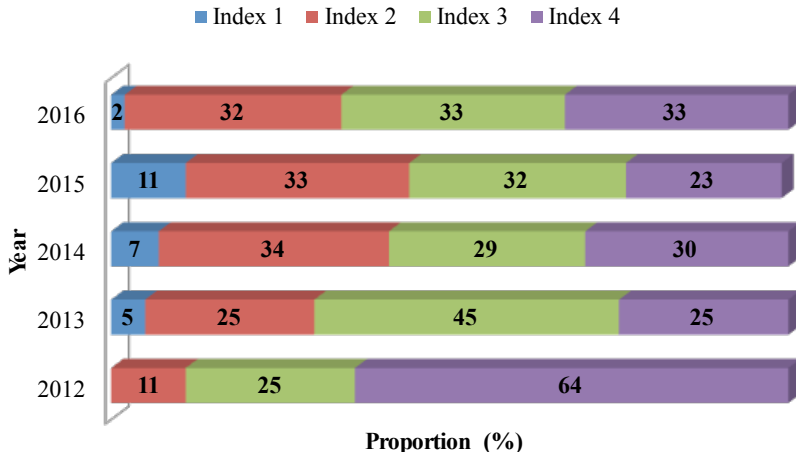


Figure 3. Proportion of the farm at each P index from 2012 to 2016

Table 2. Phosphorus levels from 2012 to 2016					
	2012	2013	2014	2015	2016
Average (ppm)	10.1	6.6	7.8	6.2	7.5
Chemical P applied(kg P/ha)	0	16.0	19.0	21.0	

The P balance was calculated for 2015 on the farm (Table 3). When all the calculations for exporting and importing P are examined the amount of surplus P available for this farm is only 8kg P/ha. So it is very difficult to increase P with the current levels of chemical P permitted.

Table 3. Phosphorus balance of the Greenfield Dairy Farm for 2015	
Chemical P Imported	Phosphorus (kg)
Concentrate Fed	300
Chemical Fertiliser	2520
Total Chemical P Imported	2830
Total Chemical P Imported (kg P /ha)	24
Chemical P Exported	Phosphorus (kg)
Milk sold and fed to calves	1414
Stock sold	513
Total Chemical P Exported	1927
Total Chemical P Exported (kg P /ha)	16
P Balance (kg P/Ha)	+8

Potash

In 2012, only 55% of the farm was at Index 3 and Index 4 (Figure 4). But, as a result of the high annual potash applications 77% of the farm is now at Index 3 and Index 4 for potash. The farm has got 70kg of K/ha annually since 2012. The target is to get the entire farm to Index 3 and Index 4 as soon as possible.

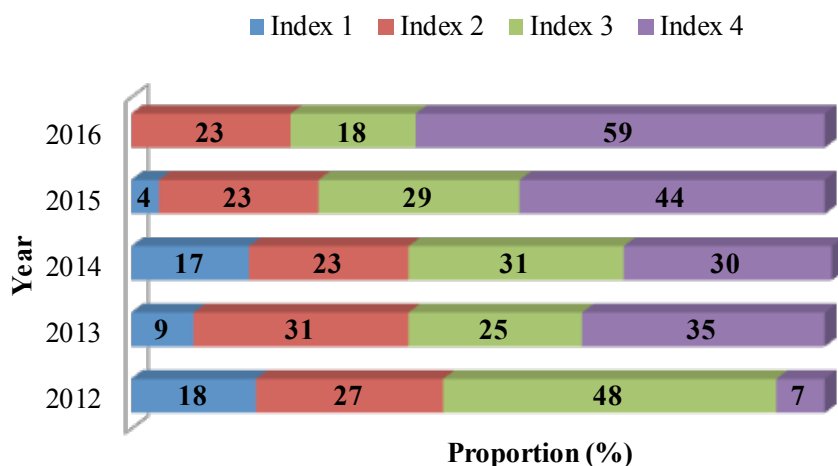


Figure 4. Proportion of the farm at each K index from 2012-2016

The Potash levels have increased from 2012 to 2016. They have increased by 49 ppm on average (Table 4). Potash is very important for root development. It is very important on a dry farm in a low rainfall area as the roots need to grow deep into the soil structure to obtain water and nutrients. Since 2012 the farm is getting 70kg K/ha on average. This has been applied to the paddocks low in potash and silage paddocks. It is applied on grazing paddocks in the spring time at lower levels and then from July onwards. A larger application is applied in August or September. Too much potash in Spring time can induce incidences of grass Tetany. It is easier to increase potash levels in a shorter time period compared to phosphorus. Ideally all paddocks would need to be at 125 ppm for maximum growth rates (20/30 paddocks are ≥ 125 ppm in 2016). In 2015, 20/30 paddocks were ≥ 125 ppm. The ideal potash levels for maximum grass growth are 125 ppm.

Table 4. Potash levels from 2012 to 2016

	2012	2013	2014	2015	2016
Average (ppm)	105	122	105	128	154
Chemical K applied (kg K/ha)	34	76	88	70	

Lime and sulphur

Lime has been applied since 2014. The pH of the soil has decreased by -0.33 from 2012 to 2016. In 2014, the farm got 100 tonnes of lime and 200 tonnes in 2015. The 2016, soil fertility test indicates that the farm needs another 300 tonnes of lime. The plan was to spread it in the Spring of 2016; but it was too wet. The paddocks that have a lower pH on the farm also have a lower P level also. Soil testing annually gives a good indication of soil fertility on an intensive farm.

Sulphur is applied from April each year on the farm. The farm gets two rounds of ASN which is a sulphur based product. A dry farm like the Greenfield Dairy Farm is unable to store sulphur in the soil so that's why it important to spread sulphur.

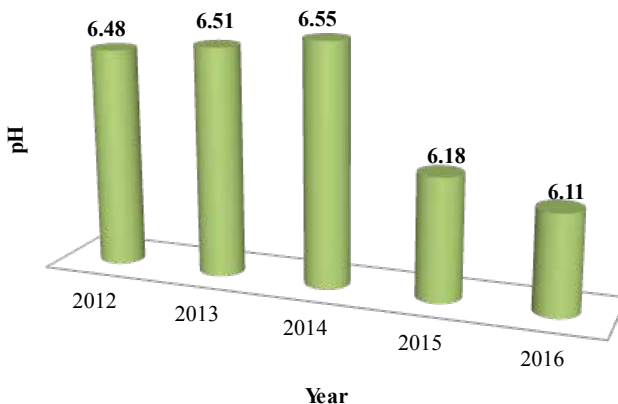


Figure 5. Average pH of the soils in the Greenfield Dairy Farm 2012 to 2016

Cultivar performance

The farm is unique in that all paddocks are monoculture grasses with clover in all paddocks. A detailed analysis of the performance of individual cultivars is provided in Table 5. To date, Tyrella has been the most consistent cultivar in terms of DM production. In 2013 and 2014, additional land (8ha) was leased and was reseeded with two more monoculture grasses (Kintyre, Aston Lord and Aberwolfe). Clover has been set in all paddocks and is growing actively from May onwards. Some cultivars are growing more grass and are very palatable. Others are growing high yields of grass but are not as palatable for the cows. Each year some perform better than other cultivars. This is probably to do with the fertility of the paddock. The paddocks that grow the most grass and the silage paddocks (incl. surplus bales) tend to drop in fertility very fast.

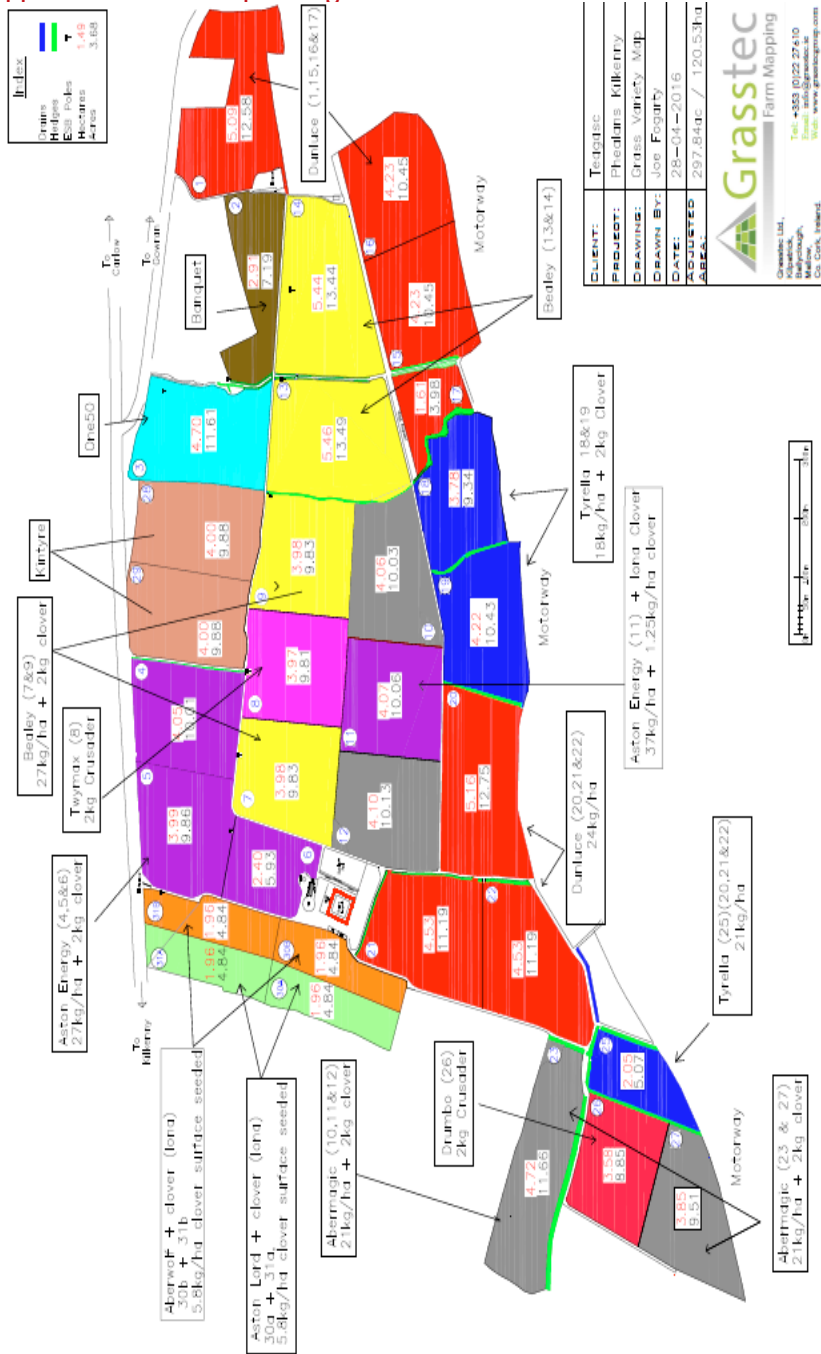
Table 5. Average cultivar performance 2012-2015 (tonnes DM/ha)

Tyrella	14.28
Twymax	11.01
One 50	12.94
Dunluice	12.09
Drumbo	11.10
Bealey	12.21
Abermagic	12.39
Aston Energy	12.12
Banquet	13.02
Kintyre(new in 2014)	12.59
Aberwolfe(new in 2015)	12.47
Aston Lord(new in 2015)	13.09

The Future of Grass Production on the farm

There will be annual challenges such as soil moisture deficits in summer and high annual rainfall in the spring that can affect grass growth and utilisation. The farm has survived two extremely cold winters, one drought summer and two higher than normal rainfall winter/springs. The fundamentals remain the same. Higher stocking rates will be achievable if the farm grows more grass and keeps utilisation high.

Appendix 1. Farm map with grass cultivars



Helping people to perform – The Greenfield experience

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Summary

Attracting and retaining good people will be a crucial aspect to successful dairy farming in the future, central to achieving this will be an efficient labour set up and having good people management skills.

The Greenfield Dairy Farm has been extremely lucky with the excellent people it has got to work with to date. It is constantly reviewing its work systems to ensure it can attract and retain great people who will deliver the desired farm performance.

The clearer people are on what's to be done on the farm, the better the job is likely to be done. Communication tools like good farm maps, standard operating procedures, and staff plans can help achieve greater clarity amongst the farm team.

Both the skills of the employee and your skills as an employer are crucial in developing an effective working relationship.

Introduction

Dairy farms are becoming busier places to work due to increasing herd size. By 2020 there will be an estimated 300,000 to 400,000 extra cows on Irish dairy farms milking above 2010 levels. This equates to an approximately 6,000 extra people working on dairy farms (*assuming 30 hours/cow/year and a total of 1,840 hours/labour unit/year*). Extra cows often come before the facilities needed for these animals are in place creating even more work load. The increased work load can mean big changes are needed in how the farm is managed. This may require new work practices to be adapted or extra people to be employed on a full or part time basis.

The more streamlined your work practices are and the better you can work with people, the more successful your farm business is likely to be. Hence, this is a topic of relevance to dairy farmers of all herd sizes.

It is crucial to remember that both these aspects of farm management are closely linked – good work practices with poor people management or vice versa will not allow any farm business perform to its potential. While the Greenfield Dairy Farm is a demonstration farm it is run as a commercial unit and must consider its people management practices the same as any business.

Achieving high levels of labour efficiency and a high standard of people management is also crucial to attract the next generation into farming – be they from farming backgrounds or not.

Every dairy farm should aim to be an enjoyable place to work, with a manageable workload for each person involved and this work to be well organised so as to minimize stress levels on people and cows. Achieving the above will help the farmer to achieve key targets and ensure the business is successful.

The focus of this paper is to discuss how people are managed on the Greenfield Dairy Farm to achieve a happy farm team capable of achieving good farm performance. Essentially this involves sourcing and retaining the right people and then supporting them to achieve the best farm performance possible.

The subsequent paper will explain in more detail the importance of the farm system and work practices employed on the farm and how these influence the above objective.

The Greenfield team

The Greenfield Dairy Farm in Kilkenny is set up to milk 350 cows with two full time staff and one part-time person from February to September. The two full time staff is Tom Lyng (*farm manager*) and Eoghan Finneran (*assistant farm manager*). Tom is from a dairy farm in Kilkenny and completed his Dairy Diploma in Kildalton in 2009. Eoghan is from a dry stock farm in Roscommon and completed his Certificate in Agriculture from Mounbellew in 2010.

Each year relief help/work experience students are employed from February to September. Typically, when work experience students finish they are replaced by relief help. Hence, there are always three people available to work on the farm which means the farm staff can have every second weekend off throughout the year and still have two full time people on the farm. This will be explained more in the rosters section.

Changes to the farm team:

A key element of working with people in dairy farming is understanding your farm team will change from time to time. People will come and go be it relief help or full time employees. The better set up your farm is and the more enjoyable a place it is to work, the longer you are likely to retain your farm team. Good people management and farm work practices (*as outlined in the next paper*) will not only help you retain people longer, they will help new people get familiar with the business quicker, helping them and the business to perform to their potential.

Table 1 outlines the different people who have been employed on the Greenfield Dairy Farm since its inception. We have been very lucky in having an excellent manager in Michael Long for the first four years, when he moved on Tom Lyng progressed from Herd Manager to Farm Manager. We have also been very lucky in that Eoghan Finneran started as a Farm Assistant and has progressed to Herd Manager. Retaining both these people in the business has been of huge value to Greenfield Dairy Farm.

While it may not be possible to offer progression to a new position on a commercial farm (*e.g. move from herd manager to farm manager*), think about how the person can progress within their position. Should they be given

more responsibility in certain areas of the farm as they are proving their worth? This could be a key part of retaining a good person as they will continue to find their job both challenging and rewarding.

There can also be positives to the farm team changing. If you invest time in training people and help them to progress their career, you will get a reputation as a good employer and this will help to attract good people in the future.

Table 1. Career Progression on the Greenfield Dairy Farm

Position	Farm Manager	Herd Manager/ Asst. Manager	Farm Assistant
2010	Michael Long	Tom Lyng	Student Placement and part time
2011	Michael Long	Tom Lyng	Student Placement and part time
2012	Michael Long	Tom Lyng	Student Placement and part time
2013	Michael Long	Tom Lyng	Student Placement and part time
2014	Tom Lyng	Eddie Kennedy/ Eoghan Finneran	Eoghan Finneran/ Student Placement and part time
2015	Tom Lyng	Eoghan Finneran	Student Placement and part time
2016	Tom Lyng	Eoghan Finneran	Student Placement and part time

Rosters

Achieving a good work/life balance is crucial for the farm team to recover and be able to fully apply themselves to their work, especially during the calving period in spring. Mistakes happen when people are tired so it is essential that hours of work manage fatigue, health and safety to good levels.

Table 2. Staff roster plan for Greenfield Dairy Farm in Kilkenny

Feb-July	11 days on and 2 days off
July-Jan	11 days on and 3 days off
Calving Shift work	Every 2 nd night on for 7-8 weeks Every 2 nd weekend on 2 nights and then *
Start Time	7am
Finish Time	5/5.30pm

*After weekend shift the person gets the Monday morning off and returns to the farm in the afternoon.

Staff planning: roles and responsibilities

To get the farm team performing, it is essential that all the people on the farm extremely clear of what jobs they need to do, by when and to what standard. One method that has been successfully implemented on the Greenfield Dairy Farm is to formalise key farm information and operational procedures into an Operating Manual which then encapsulates both farm knowledge and states clearly “how we do things”. This includes maps of farm layout, water reticulation, power routes for electric fences and standard operating procedures (S.O.P’s) for farm safety, machinery operation, financial management and reporting, disease control (*lameness, mastitis, grass tetany, milk fever, testing and vaccination, mineral supplementation*), biosecurity, pasture assessment and allocation, calf rearing, mating management, mixing teat spray, mineral mixture for dosatron etc.

Another key component of having a successful farm team in Greenfield Dairy Farm is staff planning. Staff planning is the process of deciding what has to be done on the farm and who is going to do it. The process will identify the number and type of jobs and then give an overview of the responsibilities of each staff member. This is particularly important in Greenfield Dairy Farm as Teagasc have an input into the management decisions but the farm team must carry out the actions, therefore clarity is essential.

Staff planning is a key part of the farm budget and business plan by way of optimising labour inputs and also identifies the skills that need to be hired to meet the business goals. In managing employees, staff planning helps communicate the work routine to a potential employee during recruitment and selection. It is also an important criterion in managing the performance of an employee.

How to write a Staff Plan:

To do a simple staffing plan uses the following procedure:

- Brainstorm all the major work carried out on the farm and write it up in a list similar to the example below in the Appendix 1. Owners, managers and staff may be used in the brainstorming process to ensure all ideas are fully captured. Use the examples provided as a starting point and cross off or add tasks to the list so it reflects fully on the individual farm situation.

- Start with the owner/manager column. Here the owner or primary manager on the farm has the opportunity to decide what it is they will do on the farm. This is closely linked with the business planning process in terms of managing the work-life balance and meeting lifestyle goals. The owner/manager ticks off the parts of the work load they plan to take responsibility for.
- Divide the remainder of the work between other farm staff by ticking off tasks in one column per person on the farm. This may include unpaid family labour. Be sure the responsibilities being assigned to each individual role are realistic. In the case of existing employees this means they must have the necessary skills to complete the assigned responsibilities. In the case of a new job, there is more freedom to assign responsibilities as it is possible to go out and recruit someone to fill that role. Be careful, to ensure a realistic mix of responsibilities. A further consideration is whether the job can be done in a reasonable number of hours. Initially it may not be possible to assign all vacant responsibility areas to staff because of lack of skill or experience. This means the manager will have to do them until the appropriate skills can be hired or trained.
- Finally, compare these newly designed jobs to industry standards in terms of the types of tasks and duties they will be performing e.g. the Teagasc Stepping Stones manual. The roles can then be defined in line with industry standards to decide who you need to recruit e.g. a Farm Assistant, Herd Manager or Farm Manager.

Hiring people

Getting the right people is fundamental to the successful running of a dairy unit, whether this is full or part time labour. Both education and experience need to be considered carefully. It is important that the staff have a drive to succeed, take ownership of the job and treat the unit as their own. They must be able to show initiative and be willing to deal with problems.

Likewise employers must allow people to use their initiative, must understand that others will do things differently and that getting the job completed is more important than how it is done “see good people as a resource, not a cost”. The following are characteristics that may determine the suitability of a good employee for a position:

Attitude

Attitude is relatively difficult to measure, but is still an important quality of an employee. (*Attitude encompasses integrity, enthusiasm, punctuality, general outlook on life, work ethic, willingness to learn etc.*) Employers need to get a good measure of this during an interview.

Fit within a team

How well is the applicant likely to fit in with the existing team in terms of attitude, habits? What is the team dynamic and how will this person have an effect on it?

Farming philosophies

Is the applicant an advocate of the farm's system of production? If not then this may influence the way he/she works.

Initiative

Would the applicant identify work that needs to be carried out and do it without prompting?

Flexibility

Would the applicant be the sort of person who would manage change in their daily work routine?

Time management

Would the applicant manage time effectively? Have they demonstrating this in previous roles or in college?

Communication skills

Does the applicant have good communication skills?

Experience

Has the applicant the required level of experience?

Qualification

Has the applicant the required level of education?

Other considerations

There were special requirements in relation to the Greenfield Dairy Farm position in that it is a technology demonstration unit, requiring regular interaction with visitors onto the farm covering a range of issues and requires additional communication and flexibility skills.

Employer skills: having a successful team

One of biggest challenges managing people is moving from hands on to delegating and allowing other people to do the job. A key requirement of a successful employer is his/her ability to balance attention between:

Getting the job done, to achieve results

AND

Giving attention to people

The farmers who employ the best people will be those with the best employer skills – this comprises of far more than just offering a good wage. It involves achieving high levels of job satisfaction, reasonable time off and hours worked per week, and for some candidates offering career progression.

The following approach tends to build up a good team:

Focus on results

Make sure that your staff have a clear picture of what is expected to achieve and how well should they do it. One method would be to have a formalised Operating Manual so staff can understand the farmers expectations for any particular job.

Lead by example

Set the example for the quality of work and effort you expect from each member of your staff.

Communicate

Give your staff all the information they need to do their jobs well and keep them in the picture regarding the state of the business and future developments.

Delegate

Pass down the line as much responsibility as employees can take. Ensure employees have a variety of tasks and are involved as much as possible in decision making. Giving people responsibility shows appreciation.

Give attention to individuals

Respect people as individuals, paying attention to individual needs and problems, and letting staff know the value of their contribution to the team and success of the business. Have empathy if you want people to go the extra mile for you.

Build team spirit

Develop a sense of team identity at all times, so that each individual works well with his colleagues, with common sense of purpose. An example would be having staff functions such a BBQ, Christmas party etc. Provide positive feedback regularly. These are key to developing a happy workplace.

Be fair and consistent:

Employers above all must be seen to act with fairness and integrity.

Employee requirements

The following are important requirement for an employer to consider in terms of what they provide for their farm team.

Wages

Clarity from the start, paid regularly and on time without exception.

Safe workplace

Employees will not expect to carry out jobs which could cause injury. A Health and Safety statement is essential.

Trust and respect

This is essential for both the employee and employer. For those employing people who have never been employed themselves it can be difficult to consider the employees perspective on certain issues. Put yourself into your employees' shoes.

Opportunities

Employee will expect some opportunities/incentives to potentially develop while in employment. These don't necessarily have to be financial. For example giving someone more responsibility.

Good atmosphere

There should be a good way of working on the farm. The employer is expected to be well organised.

Clarity

From the start of employment. Proper job description or terms and conditions (*both conditions of contract and working/environmental conditions*).

Consistency

Each day the main tasks are consistent e.g. milking times, feeding

Holidays

Holidays and days off agreed at an early stage. Have a plan in place if either employee or employer is suddenly unavailable e.g. illness, funeral.

Good working environment and facilities

Provision for having tea, lunch, toilets, cleaning up.

Advance notice

Of changes that are occurring on the farm.



Appendix 1. Staff planning

Farm: Greenfield Dairy Partners Key Responsibility level: Indicate if the person is responsible (R) for the task or will assist (A) by marking an R or an A	Person 1:	Person 2:	Person 3:	Person 4:
	Farm Manager	Farm Assistant	Teagasc	Contractor
	Responsibility Level:	Responsibility Level:	Responsibility Level:	Responsibility Level:
Financial Management				
Annual budget and monthly cash flows	√	A	√	R
Monitoring budgets vs. actual	√	A	√	R
Monthly reporting	√	A	√	R
Approve purchase orders	√	A		
Accounts payments	√	A	√	R
Invoicing	√	R	√	A
Liaise with accountant	√	A	√	R
Milking				
Milking	√	R	√	A
Plant hygiene	√	R	√	A
Farm dairy cleanliness	√	R	√	A
Slurry and waste water management	√	R	√	A
Communication with Co-op	√	R	√	A
Training relief milkers	√	R	√	A
Milk hygiene (test spraying)	√	R	√	A
Replacement of rubber ware	√	R	√	R
Feed management				
Management policies	√	R	√	R
Seasonal feed budgeting	√	R	√	R
Daily/weekly pasture allocation	√	R	√	A
Silage conservation	√	R	√	A
Purchase of supplementary feed	√	R	√	A
Culling & drying off cows as required	√	R	√	A
Fertiliser program	√	R	√	A
Re-seeding	√	R	√	R
Stock				
Animal health program	√	R	√	A
Calf rearing	√	R	√	A
Milk quality	√	R	√	A
Heat Detection	√	R	√	A
Calving	√	R	√	A
AI	√	R	√	A
Manage sale of surplus stock	√	R	√	A
Maintain stock records	√	R	√	A
Contract Heifer rearing				√
				R

Farm: Greenfield Dairy Partners Key Responsibility level: Indicate if the person is responsible for the task or will assist by marking an R or an A	Person 1: Farm Manager	Responsibility Level:	Person 2: Farm Assistant	Responsibility Level:	Person 3: Teagasc	Responsibility Level:	Person 4: Contractor	Responsibility Level:
Asset management								
Maintenance of all plant & machinery	√	R	√	A				
Order annual milking plant check	√	R	√	A				
Daily check on vehicles	√	R	√	R				
Building maintenance	√	R	√	A				
Fences/gates	√	R	√	A				
Lanes/tracks	√	R	√	A				
Water system	√	R	√	A				
Weeds	√	R	√	A				
Contractor management	√	R	√	A			√	A
Reporting								
Daily diary of grazing events	√	R	√	A	√	A		
Weekly stock reconciliation	√	R	√	A	√	A		
Weekly farm management notes	√	A	√	A	√	R		
Weekly farm data sheet for web	√	A	√	A	√	R		
Monthly managers' report for shareholders	√	R	√	A	√	A		
Open Days and Visitors								
Keep a log of visitors	√	R	√	A	√	A		
Host and present to visitors	√	A	√	A	√	R		
Prepare and maintain handout	√	A	√	A	√	R		
Preparation of material for Open Days	√	A	√	A	√	R		
Prepare farm for Open days	√	R	√	A	√	A		
Staff								
Recruit and select staff	√	R			√	A		
Plan and allocate work within the team	√	R						
Manage staff performance	√	R			√	A		
Administration	√	R			√	A		
Relief staff	√	R						
General								
Health & Safety	√	R	√	A	√	A		
Environmental management & consent compliance	√	R	√	A	√	A		
Maintain a tidy workplace	√	R	√	A				
Liaise with contractors	√	R	√	A				

Working smarter not harder - The Greenfield experience

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Summary

- Contract rearing of replacement heifers is used to increase milk output from the grazing platform and to increase overall labour efficiency.
- Contractors are being used to perform most machinery tasks such as silage making, fertilizer and slurry spreading, and feeding silage during the winter period. This reduces the workload and allows money to be invested in capital that will give a higher return.
- Spring labour requirement and stress has been reduced by:
 - » *Having enough people power – three full time people so everyone gets at least two and half days off every 11 days with two people on the farm working per day throughout the spring.*
 - » *Milking the herd once per day in very early lactation*
 - » *Early sale of male and surplus female calves*
 - » *Night time feeding/day time calving*
 - » *Using easy calving AI sires*
 - » *Compact calving – provide enough labour over this short time period*
 - » *Efficient calf housing and rearing system*

Introduction

The way a dairy farm is set up and the work practices a farmer chooses to employ have a huge influence on his/her labour productivity. Achieving high level of labour efficiency has many benefits e.g.:

- You get more achieved in a shorter period meaning more time for family/ leisure
- You have more time to make management decisions leading to better farm performance
- It is easier to get people to work for you and you can retain people longer

It must be highlighted that work practices are closely linked to people management; a perfectly set up farm with poor communication between the farm team will not be an enjoyable place to work and farm performance will suffer.

Farms that are increasing cow numbers and who won't employ extra help will especially need to improve work efficiency to ensure the farm workload remains sustainable. The key factor indicating the sustainability of the farm workload is hours/cow/year. The more efficient work practices are the lower hours per cow per year will be. This will enable each person to sustainably

manage more cows. A Teagasc labour efficiency study of discussion groups in 2013 found that the top 10% of farmers were working 18 hours per cow / year while the average was 32 hours per cow. This indicates there is room for improvement on many farms. Discussing livestock units per person on its own is an unsustainable metric as it gives no indication as to the overall workload of the individual person. The number of hours worked per cow/year on the Greenfield Dairy Farm is 14 hours. The total number of hours worked by each of the farm staff is 2,016 hours per year (*this excludes bank holidays, annual leave and weekends off*).

This paper will discuss the key aspects of the farm system and work practices on the Greenfield Dairy Farm which allow the farm team to manage the farm in an efficient manner.

Contract heifer rearing

Contract heifer rearing is definitely an option worth considering in the following situations:

- Where overall farm profit can be increased with a greater number of cows e.g. if heifers are being reared on potential milking platform ground;
- Farms where labour is a limiting constraint;
- Farms where land is a limiting constraint;
- Farms where replacement heifers are failing to reach the target live weights;
- Farms where separation of cows from replacement heifers (*even calves*) is required for disease control purposes e.g. Johne's Disease.

A significant element of reducing labour on the Greenfield Dairy Farm is the fact that replacements are contract reared. Replacement heifer calves leave the farm at two weeks of age and return a month before calving. This allows farm staff to concentrate on the milking herd and simplifies the labour required.

Teagasc has prepared a number of documents to support parties interested in the contract rearing of replacement heifers and these can be assessed on the Teagasc web-site: (http://www.teagasc.ie/collaborativearrangements/contract_rearing_of_heifers.asp). They include: (1) Booklet that contains details regarding target live weights, guideline costing, and advice on the risks involved and disease control; (2) Specimen heifer rearing contracts; and (3) Heifer rearing cost calculator.

We have drawn up a contract with our rearer and feel strongly that all contract rearing arrangements should be written down to ensure each party is clear on what is required and who is responsible for what. We also feel that strategic weighing of animals at specified times of the year are essential to a good working arrangement. The replacement heifers on the Greenfield Dairy Farm are reared by a contact rearer at a cost of €1.05/day; however under this arrangement AI and vaccination costs plus one herd test are covered by the Greenfield Dairy Farm.

Contracting

The use of contractors is a key element to labour management in Greenfield Dairy Farm. All machinery work – fertilizer and slurry spreading, silage feeding, reseeding, etc. is completed by contractors. This allows the farm team to focus on managing cows and grass. The following points need to be carefully considered when considering purchasing machinery:

- Machinery investment needs to be carefully planned because of the long term nature of such investment – what else could you use the money for? Capital is often limiting for expanding farms. Should you be spending your money where you will get a higher return?
- Will you or your farm team have the time to operate the machinery? Is there room to add to the current workload or should you be trying to outsource work?
- The concept of an individual contractor specialising in machinery operations and offering that service across a number of farms has the potential to be a cost and labour efficient means of supplying mechanisation needs.
- Also consider the running and maintenance costs of the machine when comparing to contractor costs

For the reasons outlined above it was decided that all machinery operations in the Greenfield Dairy Farm would be contracted out. The total contractor and machinery expenses on the Greenfield Dairy Farm were 3.9c/l in 2015; this compares favourably with 3.8 c/l recorded on dairy Profit Monitor farm (*not including labour*). Fertiliser is bulk spread once per month for February, March, April, August and September. From the third week in April during the main grass growing season it is spread once per week. Feeding the cows during the winter would take three to four hours every day with our own machinery. Our feeding contractor (*also the silage contractor*) with a much larger machine (*Volvo loader*) can get the job done in about 3 hours per week. Silage cutting, mowing the surplus paddocks and baling is a big part of the farm's contractor cost but it greatly improves the summer grassland management. Surplus grass as round bales is a great source of quality feed for feeding milking cows in early spring or late autumn. Table 1 shows the tasks that are undertaken by the machinery contractor and approximate costs involved. The costs were taken from Management Data for farm planning handbook 2013/2014; all costs are exclusive of VAT. A biosecurity protocol should be agreed between dairy farmer and the contractor.

Table 1. Farm machinery tasks and a range of costs obtained		
Tasks	Description	Costs
Fertilizer spreading	With or without fertiliser handling	€32-42/ tonne
Slurry spreading-umbilical	Agitation Spreading	€45-55/ hour €85-120 / hour
Silage -large round bales	Cutting, bailing and stacking	€15 / bale
Feeding	Loading and feeding	€40 / hour
Reseeding	Cultivation(incl. spraying), Seeding, Rolling, Grass seed	€247-308/ha

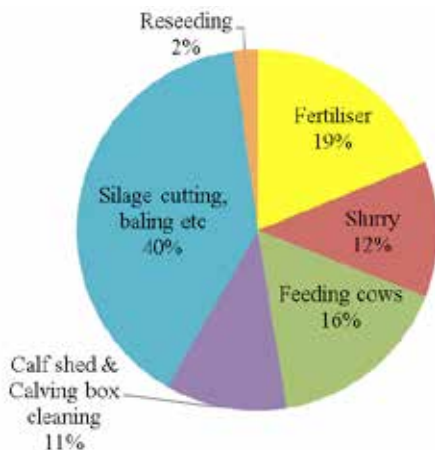


Figure 1. Shows the proportion of the total annual machinery contractor hours for different tasks

Spring management

There are two full time labour units working on the farm – Tom Lyng and Eoghan Finneran. In addition there is also an agricultural student employed from February to September. Farm Relief staff also fill in when farm staff are on holidays or days off.

In the first four months of the year the main farm tasks involve calving and calf care, milking plus associated tasks and office work. From mid-April to end of July milking, grassland management, and breeding take up the majority of time. From July to end of the year grassland management and milking is the key time consuming chores. Workload is highest in the spring time. Compact calving means a shorter but a busy period. In 2016 over 80% (280 cows) of cows calved in the first six weeks; only 43 (12%) of cows were left to calve after St. Patrick's Day. Since 2012, no cows calve in the month of May.

Figure 2 shows the main areas of work by the farm staff in the spring time. As mentioned previously the machinery work is contracted so that there is more time for milking, calving, calf rearing etc. The farm manager has to spend a high proportion of his time at managing the farm. This time is needed for planning, organising, grass walking, selling stock, stock registrations, buying etc.

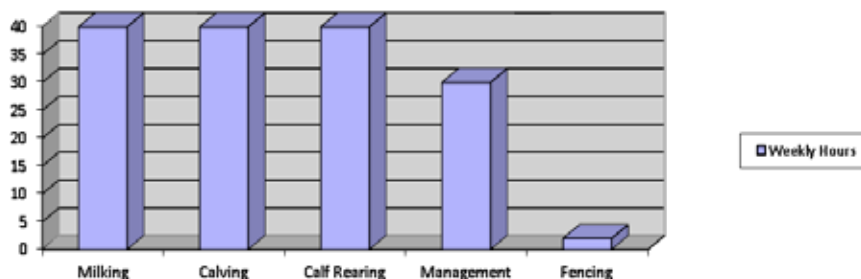


Figure 2. Number of hours per week for various tasks in the first 6-weeks of calving

The following work practices are implemented in the Greenfield Dairy Farm to reduce work load and stress in the spring period:

Once a day (OAD) milking for the first four weeks of calving

This was a huge benefit this spring in reducing stress on cows and the farm staff. It allowed extra time to focus on calving and calf management during the busy February period. Milk solids production in February 2016 was 2,197kg higher compared to the same period in 2015 despite milking OAD; however there were 43 extra cows calved by the end of February 2016 compared to 2015. Research suggest milking cows OAD for three weeks in early lactation will reduce current yield by 15-20% and total lactation yield by 7%. Cow condition score benefited greatly to the once a day milking in February. We plan to do this again in future years. Additionally, any cows less than 2.75 BCS 3-4 weeks prior to the start of AI are put on OAD until they returned to condition score 3.

Calf shed

In the spring of 2016, a contractor was hired for one day per week (six hours every Monday) for eight weeks to clean the calf sheds and calving area. This was a great help to the farm staff and it helped improve hygiene in the calving area and calf sheds during the busy calving period. As a result of this more time was allocated to certain jobs such as milk quality management on the farm.

Calf management

All calves are stomach tubed with first biestings immediately after been born. This means all calves are fed adequate biestings. This works well when a lot of cows are calving and this especially happens after night time feeding/day time calving. All male or surplus heifer calves are sold as soon as possible- 2-3 weeks of age. Each year the earliest born heifer calves are retained for replacements and are dispatched to the contract rearer at 2-3 weeks of age.

Mastitis control

All of the in-calf heifers were teat sealed at about four weeks before calving. This resulted in very few heifers calving down with mastitis in 2016; prior to this a large number of heifers calved with clinical mastitis. Teat sealing the heifers has reduced the number of heifers with mastitis in early lactation. All freshly calved cows were CMT tested before being introduced into the main herd. Additionally, the first milk recording was organised for mid-February; cows that were high in SCC were treated. This gave us greater control of mastitis in early lactation and therefore lowers SCC for the remainder of lactation.

Easy calving AI sires

Using easy calving sires in maiden heifers (<2% calving difficulty) and cows (<2.5% calving difficulty) reduces workload at calving time. While often overlooked it is crucial that easy calving short gestation bulls are used and the same criteria is used for beef AI sires (<2.5% calving difficulty) once enough dairy sires have been used. The net result is that calves are hardy and the cow is back on her feet quickly after calving so less individual cow attention is required. A knock on effect is that there are less reproductive infections and improved fertility performance.

Night time feeding /day time calving

For the two weeks prior to calving, cows are given access to silage only from 4.30pm to 7am. This has resulted in 90% of the cows calving between 7am and 11pm. Farm staff stay on the farm (about 8 weeks) to check for any night time calving. Each person works 1 night on and 1 night off during this period. In order to have the weekend off the person working for the weekend stays on the farm for night time calvings. This person then gets time off on Monday until the evening milking to recuperate.

Stressors on the Farm and Action taken

Every farm has certain areas that can cause low morale or high stress. It is important to deal with the stressor by discussing ways of managing or reducing the stress. Table 2 highlights some of the areas that have caused stress over the last few years.

Table 2. Stressors and action of some of the typical stress areas on the farm

Stressors	Result	Action
SCC	Staph Aureus spreading from cow to cows and causing SCC problems	Teat sealing, monthly milk recording and acting on the results
Not having a dump line	Delays in milking time in Spring	None yet
Slow milkers	Delays in milking time	Culled two cows last year
Second herd too large (>30)	Delay in milking time	Keep at 30 if possible
Contractor not arriving on time	Delay on growth rates and grass quality	Communication
Not having enough pig tails/wires/gaps to paddocks	Time wasted taking down fences and only two breaks set up instead of four.	Bought more pig tails and made more gaps to paddocks
Sick Calves/ Rotavirus (Spring 2015)	High stress on staff, too much time spend in calf shed. Low staff morale.	Vaccinated for rotavirus since 2015

Wellbeing

The fundamental principle of labour management on the Greenfield Dairy Farm is to ensure the farm staff are happy and enjoy their work. In periods of high pressure and especially for the first few months of the year it is important that everyone communicates clearly to each other and a clear plan is written down for certain jobs. Working with positive people helps to make the workload easier and much more enjoyable. A positive attitude is a key requirement when hiring people for Greenfields.

Everybody deals with stress differently. The farm staff find the following useful to reduce stress:

- Be relaxed
- Be organised
- Go for a walk after work
- Working with a like-minded person
- Good to get away from the farm every second weekend

Every farmer and farm business should focus on developing a mentoring system for themselves or farm staff. The Greenfield Dairy Farm staff find the weekly grass farm walk useful as there are really useful discussions while walking. Generally what may have been a big problem at the start of the walk is a small one at the end of the walk. This walk and the discussion afterwards is used to problem solve and to review the previous week's actions. We also discuss the actions and reminders for the week ahead. We log the lessons learned and mistakes made (e.g. walking the cows too far in late

lactation) so we have them for reference for the following year. The local vet is also a huge asset to the smooth running of the farm.

Farm debt and lack of cash flow can cause serious stress for commercial farmers. In a low milk price year like this year a key part of managing this stress is having an annual budget which gives you clarity on exactly what your financial position is. It may not be as bad as you think or if it is bad a budget will identify how much your short and allow you to take action by cutting costs or potentially talking to your bank. The Greenfield Dairy Farm budget is reviewed throughout the year. By adhering to the plan and reviewing the plan regularly it will reduce the stress on the business. All capital expenditure on the farm is reviewed thoroughly before a decision is made. It is important to communicate with a banker, accountant, family member if cash flow or debt is a problem on your farm.

Both farm staff put great emphasis on planning/organisation/time management. For example, the day before vaccinating everything is organised, the crush should be working and there shouldn't be any other jobs occurring on that day. This reduces time wasting on the day of the job. The staff emphasise that the work environment must be enjoyable. This is achievable by the simple system that is on the farm. Having a good team dynamic is also a key part creating an enjoyable work environment. The farm staff rate the following personality traits in people they work with as essential (1) the right attitude, (2) honest, (3) positive person and (4) willingness to learn.

It is an objective of the Greenfield shareholders to improve the skills sets of the farm staff; both farm staff were trained to do DIY AI; both farm staff actively participate in the Greenfield Academy.

Conclusion

All these aspects of labour and people management allow the farm to be run in an efficient manor. This in turns creates more time for the farm team (*especially the manager*) to focus on making management decisions that will ensure continued good performance. As opposed to him/her being so busy keeping on top of the day to day workload that they don't have time to make timely and correct decisions. Improving people management and labour efficiency will be crucial areas for farmers to focus on in the future.

The farm team attended a mental and physical wellbeing workshop which was organised by the Greenfield Academy group in December 2015. This reemphasised important aspects of wellness like being positive and eating healthy.

Coping with milk price volatility

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Summary

- Milk price volatility is a key feature of international dairy markets since 2007
- Long term volatility management strategies
 - » *Optimising farm profit*
 - » *Cash flow budgeting*
 - » *Increase milk solids concentrations*
 - » *Fixing milk price*
 - » *Cash management*
- Short term volatility management strategies
 - » *Reduce costs*
 - » *Develop short term cash flow budget*
 - » *Evaluate options to sell livestock*
 - » *Reduce/eliminate capital development*
 - » *Liaise with your bank*
 - » *Communicate with others*

Introduction

Milk price volatility a key feature of dairy farming today and this is likely to continue as the world market responds to changes in product supply and demand. In the past various levels of protection, operating mainly at EU level, provided market support at times when there was an imbalance in the EU supply/demand dynamic. However, this protection has not operated at the market level to a large extent since 2007 (*except in exceptional circumstances*), which has meant that the milk price received by farmers is much more volatile now than experienced in the past (*See Figure 1*). Currently, milk price is in a significant trough, which is causing many problems for virtually all dairy industries around the world. Ireland's milk production represents approximately 0.8% of global production and irrespective of our scale or how much we expand; in general we are price takers. Therefore, the focus at farm level must be based on putting the farm in the best possible position to deal with a volatile price while availing of tools and mechanisms to stabilise price. It must also be recognised that most dairy farmers in Ireland this year will experience a cash deficit when they combine the cash generated from the dairy farm with their drawings and tax from the business. The rest of this paper will focus on long and short term volatility management strategies on Irish dairy farms.

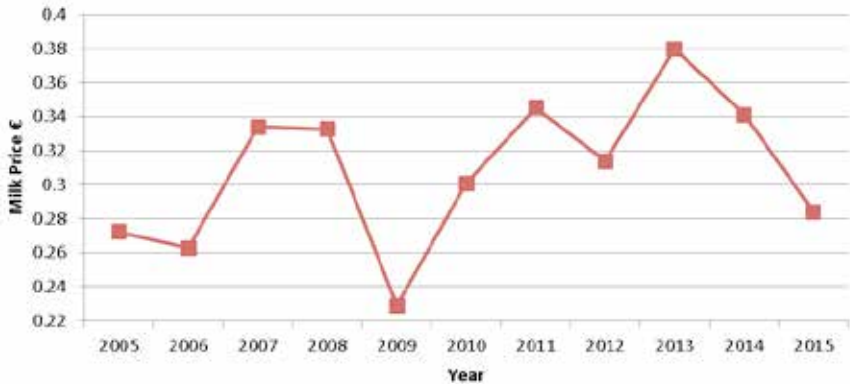


Figure 1. Base milk price received by Irish farmers between 2005 and 2015.

Long term volatility management strategies

Optimising farm profitability

The first and key step in ensuring the resilience of any business during periods of low milk prices centres on having the right system in place. The overall system operated on farm will be a key determinant of business resilience. A focus on a high EBI/crossbred cow within a system that maximises grass growth, matching grass growth and demand while minimising capital investment will result in a business that has a low overall cost base and will be best placed to deal with price volatility. Based on the analysis of National Farm Survey data, maximising grazed grass utilisation and minimising purchased supplementary feed use will maximise farm profit per hectare and per kg MS produced. Nationally, there is huge scope to increase grass utilisation and reduce the levels of bought in feed across the national dairy herd. Having the right type of robust cow capable of converting grass to milk in an efficient manner, producing high milk solids, with minimal supplementation and capable of withstanding short term fluctuations in feed supply, with a low replacement rate and associated with a reduced labour requirement are essential parts of a resilient business.

Cash flow budgeting

The expansion process at farm level has put a significant strain on scarce cash resources and is confounded by the current drop in milk prices. Expansion usually results in increased debt servicing costs, reduced immediate farm productivity, growing stock numbers and increased on-going farm development costs. In many cases the on-farm investment is completed from cash generated from within the business instead of from borrowings which places unnecessary additional strain on the business. The creation of cash flow budgets that can be used to identify particular cash deficits within and between years, and can allow a plan to be developed around financing expansion and managing cash is a must for the business. For many farmers, this process will identify potential pit-falls during the expansion process and will provide opportunities to seek solutions. For

example, seeking a moratorium on capital repayments of bank debt for the initial period of the expansion could make the process viable and reduce the exposure to liquidity issues. Another solution would be to secure short-term finance (*within year*) to overcome periods of cash deficit as occurred on many farms in the spring of 2013. Cash flow budgets should be set up at the start of the year. On at least a quarterly basis, these budgets should be compared with actual cash flow from the bank statements. Ideally this process should be undertaken with the bank to build a strong relationship and understanding between the bank and the business. After each review process, projections should be completed for the remainder of the year to determine the new overall picture for the farm and steps should be taken if a cash deficit issue is apparent.

Increase milk solids concentrations

Most milk payment systems across the country are now based on the A+B-C system to reward farmers for higher milk solids concentrations. There has been significant progress made at farm level over the past 10 years based on investment in breeding and grassland management. Figure 2 shows the change in fat and protein concentration over the past 15 years on Irish dairy farms. It is evident that the annual increase in milk solids concentrations is higher now than it was in the past. At a base milk price of 29c/l and based on the 2015 milk volume output, the increase in solids concentrations between 2000 and 2015 is worth €161 million annually at farm level or 2.5c/l. While the benefits from increasing milk solids concentrations decline with lower milk prices the relative benefit becomes more important at lower milk prices. A key strategy at farm level around volatility management must centre on the increasing the milk solids concentrations of the farm.

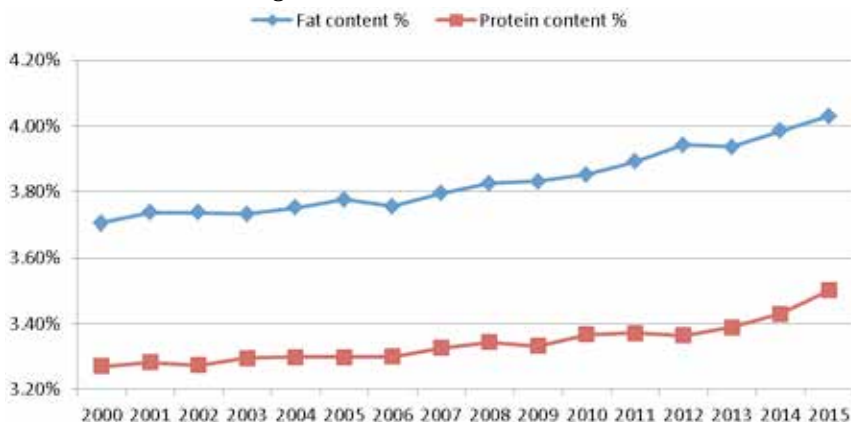


Figure 2. Fat and protein concentration changes between the year 2000 and 2015 on Irish dairy farms

Fixing milk price

The introduction of fixed price contracts has become much more common across most milk processors over the past five years. While these pricing mechanisms are new in Ireland, different formations have been available

in other countries (*particularly in the US*) for a much longer period. A study completed by the United Farmers of America in 2014 showed that on average the milk price was 0.9% lower over a 14 year period when opting for the fixed price contract, but the same study noted that much of the extremes in price movement were avoided through fixing the price. Results from the Greenfield (*See Greenfield financial paper*) where the option to fix some of the milk price has been availed of since 2011 has shown that overall the milk price paid by the fixed price schemes has been higher than the variable prices and the effect in any individual year was significant.

Cash management

With milk price volatility if not managed on farm, periods of significant acute cash surpluses and deficits become much more common. If not managed correctly, these periods could result in increased costs at farm level coupled with increased stress for those working in the business. This will be exacerbated by the requirement to make tax returns potentially in periods of low prices based on profits generated when milk prices were higher. Therefore, a key strategy on farm to manage volatility should involve creating a cash reserve when prices are high. Ultimately this puts power back in the farmer's hands and creates a situation that the farmer is less vulnerable when price drops. While this strategy is possible at farm level, there is a requirement to have the taxation structure of the business set up in an efficient manner to allow the business to create cash reserves. Internationally there are taxation structures (*Farm Management Deposit Scheme and Income Equalisation Scheme*) operated in Australia and New Zealand that facilitate the creation of cash buffers in a tax efficient manner, with similar schemes required for Ireland and in reality right across the EU in order to manage volatility.

Short term volatility management strategies

In a low milk price year the price received for milk is likely to be less than the total cost of production including the farmers own labour for most farmers in Ireland. As long as the industry maintains its competitiveness it is likely that the periods of low milk prices will be relatively short lived as the low milk price will cause a supply correction in the least competitive industries. In reality there is no magic bullet that will sort out the entire farm problems in a low milk price, the objectives of management in a low milk price year should be to generate adequate family drawings and to ensure the long term potential of the farm business is not significantly damaged.

Reduce costs - Within a year like 2016, there is no one silver bullet that would lead to a massive reduction in costs. In reality, no one option will fit all farms and therefore there is no one solution. All costs should be considered for potential saving and the impact of a reduction on each input should be assessed. Certain costs will have limited effect on the long term productivity of the farm and these should be prioritised for savings. In a low milk price year, it is certain that the margin in producing milk from purchased feed will be negative so the aim should be to match the stocking rate on the farm to the grass growth potential of the farm. Sell cows that may not have a long term future in the herd, older cows, late calving etc. and

sell them while their sale will help reduce feed demand on the farm. Cost savings are available by refocusing of producing milk from grazed grass and ensuring that pre-grazing yields, post grazing residuals and overall growth is optimised.

Careful consideration should be given to decisions around for example breeding and health related expenditures across the farm with plans in mind for dairy heifer requirements in the subsequent years. Silage requirements should be calculated for 2016/2017 based on stock numbers planned, including current reserves and building in a buffer to ensure that adequate areas are being conserved. Investigation around the potential to reduce fertiliser costs by switching from CAN to Urea should be considered when conditions are suitable.

Develop short term cash flow budget - It is imperative that every farmer creates a cash flow synopsis of how the farm will perform this year as soon as possible. In reality this opening exercise should be used to identify a potential problem as well as the level of the problem and depending on the outcome will determine the urgency of the requirement to complete a cash flow budget for the farm. The farm tax accounts for 2015 should be completed immediately and used as the starting point to create a financial picture of the farm for 2016 followed by the completion of a source and application of funds for the 2015 accounts which can then be used for the 2016 projections coupled with changes in milk outputs, milk values, livestock sales and any cost category changes. Table 2 and Table 3 provide templates that can be used to create a picture of the financial performance of the farm in 2016 by firstly completely a source and application of funds for 2015 followed by 2016 including the adjustments based on changes in milk receipts and total costs.

Table 2. Source and application of funds for 2015 based on completed tax accounts

Source & Application of funds 2015	€
Net Profit from accounts 2015	
Plus Depreciation	
Plus Bank Interest	
Less Bank Repayments	
Disposable Cash 2015	
Less Family Drawings	
Less Tax	
Surplus/Deficit Cash 2015	

Table 3. Source and application of funds for 2016 based on completed tax accounts for 2015 and adjustments based on expected changes to costs and receipts on farm

Source & Application of funds 2016	€
Net Profit from accounts 2016	
Adjustments Receipts	
Adjustments Costs	
Plus Depreciation	
Plus Bank Interest	
Less Bank Repayments	
Disposable Cash 2016	
Less Family Drawings	
Less Tax	
Surplus/Deficit Cash 2016	

Adjustments that may be included in Table 3 (e.g. may be a lower milk price $5c/l * 400,000l = €20,000$, More milk produced $50,000 * 27c/l = €13,500$, lower fertiliser costs $€50/tonne * 37t = €1,850$, etc).

While it is prudent to always generate a monthly cash flow budget for the farm, this becomes significantly more important in a low milk price year. This is a forecast of the money entering and leaving your bank account each month. This can be completed using tools like the Teagasc Cost Control Planner or other such budgeting software, but could also be completed using a pen, paper and a calculator. All cash revenue and costs should be included for the farm as well as capital and interest payments, family drawings and a provision for tax. Be conservative in the way you budget; it's better to underestimate production plus milk price and overestimate expenses. Don't wait until there is no cash in the account, complete while there are options and decisions that can be made which will not damage the long term potential while ensuring that the short term cash deficit can be managed. Once the cash flow budget is developed and the size of the potential problem is identified a range of options can be considered. No one option will fit all farms and therefore there is no one solution and thus the budget will help with the decision making process around deciding on the best next steps. The plan should be reviewed quarterly and adjustments made when the forecasted budget deficit is increasing.

Evaluate options to sell surplus livestock - There may be potential to free up some cash from the sales of beef or other stock that are surplus to requirements on the farm especially if the farm is being operated at a high overall stocking rate. Consideration should be given to selling some of those earlier rather than later, thus helping reduce feed demand on the farm and ultimately generating cash while reducing costs.

Reduce/eliminate capital investment - There should be no/minimal capital expenditure completed unless the cash flow plan allows or is based on structured borrowings and all farm maintenance should be minimised. In reality on most farms there will be little scope for significant development, while in most cases this will have been financed by long term debt, there is a justification for postponing all development in the short term to allow the business get over this time of depressed prices. If still considering farm development projects a significant contingency fund should be included in the budget and ensure that there is financial resources available to cover the contingency if required. Given the current market situations it may be prudent to ensure that any expansion planned for the farm is right based on the new and current circumstances. Any investment should be prioritised based on its potential to provide a significant return to the farm as a whole.

Liaise with your bank - The cash flow budget should be discussed with your bank. There may be a requirement for short term credit facilities and where debt servicing is a significant proportion of total costs there may be a possibility to take a moratorium from capital repayments in the short term. There may also be potential to retrospectively finance development work completed on the farm in the past 2 years from cash flow with medium term debt. It is extremely important that farmers are proactive with the bank and that contact is made at the earliest possible opportunity in order to put a plan in place to get over the short term issues.

Communication with others - Dealing with these issues can be extremely stressful and should not be dealt with in isolation by any individual. While it is not second nature to share problems with others there is in general positive outcomes from the sharing of the individual problems.

Managing through a Downturn

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Summary

The critical aspect of managing a viable business through a downturn is to ensure the business has adequate cash available to continue to trade and operate efficiently.

To determine if your business has and will continue to have adequate cash available for the foreseeable future you will need to first determine your current position (*Table 1*) which is a list of all of your current liabilities.

The second and more challenging task is to quantify all of your cash income and expenditure to the year end (*Table 2*), This will allow you to access if there is enough cash available to the business from now until year end, it would be prudent to be cautious on your predictions for cash sales and to allow for some unforeseen costs that may arise.

Once an assessment is made of the size of any potential deficit a range of options can be examined to determine their impact on the short term cash position and the long term viability of the business.

The following are potential areas to examine to try and bridge the gap between income & spending

- Prioritise essential living expenses.
- Eliminate all non-essential expenditure.
- Reduce Debt Repayment –
 - » Consolidate/ restructure several loans over a longer term or investigate “interest-only” BUT watch that interest rate is competitive.
 - » Investigate “payment holidays” on machinery lease payments.
 - » Negotiate with merchants to avoid paying excessive penalty interest on overdue accounts.
- Talk to your accountant NOW about your potential tax bill payable by 31st October – plan now to avoid another cash flow shock.
- Reduce stocking rate to match the growth potential of the farm through sale of trading stock.
- Target beef cattle, stores for sale, early sale of cull stock, excess replacement stock.

Table 1. List of all current debt as of today 18/05/2016

	Loan Name/ Debtor	Current Amount Outstanding	Remaining Loan Term (years)	Current Interest Rate	Total Repayment per year	Payments due before 1 st Dec 2016
Term Loans (incl. house mortgage)		€		%	€	€
		€		%	€	€
		€		%	€	€
		€		%	€	€
Overdraft & Stocking Loans		€		%	€	€
		€		%	€	€
		€		%	€	€
Merchant Co-Op Debt (+outstanding farm-to-farm debt)		€		%		€
		€		%		€
		€		%		€
		€		%		€
		€		%		€
Hire Purchase/ Finance		€		%	€	€
		€		%	€	€
Total Payments						€

Table 2. Cash Flow Assessment			
Cash Out [to 31 st December 2016]	Current Outstanding	From Today to 31 st December 2016	Total
Total Repayments From above	€	€	€
Feed & Fertiliser		€	€
Contractor	€	€	€
Vet	€	€	€
Other Operating Expenses	€	€	€
Health Ins/ Policies (Pension etc)	€	€	€
Tax	€	€	€
Living Expenses	€	€	€
Total Payments			€
Cash In [to 1 st December 2016]	To Date		
Farm Sales (milk + other Sales less Exp. not included above)		€	€
Direct Payments (SFP, AEOS, SWCS)		€	€
Off Farm Income (Net)		€	€
Child Benefit, Pension, Farm Assist,		€	€
Total Net Income Available			€
Balance Surplus /Deficit (Deficit should not exceed available merchant credit and OD limit)			

Managing through 2016

Patrick O'Meara

Agriculture Adviser, AIB, Nenagh, Co. Tipperary

2016 will be a difficult year on many Irish dairy farms. The relatively high average milk price experienced in recent year has declined by over 36% since 2013 and it is clear, at this stage, that the average price in 2016 will not be anywhere near the prices achieved in 2013 and 2014.

While at a national level the dairy sector is in a strong position, it is important that all dairy farmers review their own situation to determine the impact that another year of low milk prices could have on their business.

Calculating your break-even price

A useful starting position for some is to review the most recent Profit and Loss accounts for the farm and looking ahead ask 'What is the break-even milk price that I need this year to cover farm costs, living expenses, bank repayments and income tax next year, assuming all other things are equal?'

Calculating a farm's break-even milk price is an entirely farm specific exercise. It is the milk price that your farm business needs to meet all cash commitments. This calculation should include both capital and interest financial repayments, drawings/household expenses and taxation. It should exclude depreciation as this is a non-cash expense (*the capital portion of repayments is included in its place*). This exercise allows you establish at what price your business will be in a cash deficit. I have included below an example of a break even calculation for a dairy farm supplying 400,000 litres. In this example the break-even milk price is 27.5c/litre of milk supplied, which is typical of many farms. It is important to note that this example doesn't include any capital development or change of stock values.

Table 1. Farmer supplying 400,000 litres of milk

	€	C / litre
Farm costs (excluding Depreciation and Bank Interest)	85,000	21.25
Capital Expenditure from Cashflow	-	-
Bank Repayments	15,000	3.75
Drawings / Living expenses (required from farm)	35,000	8.75
Income Tax	5,000	1.25
Total costs	140,000	35.00
Less Income from non-milk sales (calves / culls / beef / direct payments)	-30,000	-7.50
Total Income required from milk sales	110,000	27.5
Break-even milk price	27.5c / litre	

Figures used for illustrative purposes only.

Completion of this exercise should highlight your existing position, whether or not you need to take further action such as reducing costs or adding value

to your output, and how much action you need to take. When completing the exercise it is important to consider how items will change in the coming year, since the period you analysed.

Some farmers are likely to experience periods of cashflow deficits this year and I believe that farmers should take a three step approach to dealing with cashflow pressure or even potential cashflow pressure. This will help ensure that you are not just treating the symptoms, but the underlying root cause of the cashflow pressure giving you the opportunity to correct any underlying issues that may exist.

Understand the cause of the cashflow pressure (or likely cashflow pressure)

It is important to understand the cause of cashflow pressure on your farm as this will give you a real insight into how your business is positioned for the medium term. While the low milk price may be the trigger for the cashflow pressure currently experienced or anticipated, there may also be other reasons impacting on the farms cashflow including:

- Building up livestock from cashflow
- Carrying out capital expenditure from cashflow (or a portion of it, from cashflow)
- High level of bank debt / high level of bank repayments
- Farm has a high cost of production
- High level of drawings
- High machinery costs
- Restricted herd / disease / other on farm issues
- Once off high costs

Once you have identified the cause (and/or causes), this will enable you to put a plan in place to take corrective action.

Estimate the size of support required:

When you are planning for the coming year, it is important to estimate how much additional support your business will require, if any. You will need to make certain assumptions around output price, performance, costs and living expenses. In general, the best starting point is to review the previous year and estimate based on previous performance. (It must be remembered that 2015 was a favourable year for animal performance and weather).

A cashflow projection for the coming year will help highlight how much of a shortfall will arise (if any) and when it will arise. This will enable you to put the most appropriate solution in place for your business at an early stage rather than continually reacting to cashflow problems during the year. A simple cashflow planning template is available at www.aib.ie/farming.

Develop a solution:

Once you understand the cause of the cashflow pressure you will know whether it is a once off, or an ongoing issue for you. From completing the cashflow projection you will now know how much of a shortfall your business is likely to incur and therefore you can develop a solution. This will put you in a strong position if you are meeting your bank to seek support.

It is worth highlighting that the earlier you develop a solution the more options that may be available to you. For instance if the solution was to reduce living expenses or place a loan on interest only, the earlier you take action, the greater impact this will have on your business.

While it may be an appropriate solution for some, on many farms the initial reaction to cashflow pressure is often to think about going on a period of interest only for existing bank borrowings and hope that the issue sorts itself out in this period. However, there are a number of other options that should be looked at also including holding off building up livestock numbers for a period, controlling living expenses by taking a set wage each week/month or placing recent capital expenditure from cashflow on a term loan.

From AIB's perspective, I have outlined below the typical support measures that are available to customers experiencing short term cashflow difficulties. In some instances, the cost of credit may increase as a result of these measures.

- Short-term increase to working capital facilities
- Short-term loan facilities
- An interest only period on existing facilities.

If you are experiencing or expect to experience cashflow difficulties, the important thing is to remember that there are a number of support options available to you. Take the time to inform yourself, identify the cause or causes of the problem and estimate the level of support required. Solutions are best tailored at an early stage and early contact with your bank, if support is required, is key.

For those of you who would like to speak to somebody in AIB on how we can help you and your business, contact your local AIB branch or call 1890 47 88 33 (available 8am-9pm on weekdays and 9am-6pm on Saturdays).

Lending criteria, terms and conditions apply. Credit facilities are subject to repayment capacity and financial status and are not available to persons under 18 years of age. Security may be required. Allied Irish Banks, p.l.c. is regulated by the Central Bank of Ireland.

Notes

EXTENDED HOURS FOR FARMERS

CALL OUR DEDICATED TEAM ON 1890 47 88 33
8AM-9PM MON-FRI, 9AM-6PM SAT

Brave doesn't just work 9 to 5 or take Saturdays off. So our dedicated business and agri team don't either. It's just one of the ways we're backing farmers. It's just one of the ways

WE'RE BACKING BRAVE

CALL 1890 47 88 33

#backedbyAIB



BRANCH. PHONE. ONLINE.

The featured customer has received a gratuity on behalf of AIB for their time in making this advertisement. Allied Irish Banks, p.l.c. is regulated by the Central Bank of Ireland.

Enter our competition and you could win a Tablet.

Name: _____

Address: _____

Email Address: _____

Contact phone number: _____

Local AIB Branch: _____

Which of the below products do AIB offer to Agri Customers?

- 1. Farmer Credit Line
- 2. Farm Development Loans
- 3. All of the above

In fifteen words or less, "AIB can help dairy farmers in the following ways....."

I have read and hereby accept all terms and conditions

Data Protection – Use of Information Notice

The information you provide today will only be used for the purpose of a 'contact follow up' and will not be used for any other purposes in the future. By providing your details to AIB today you consent to being contacted by us in relation to this engagement. Contact may be made via email, telephone or post.

Signature: _____

Date: _____

Competition Rules

1. To be eligible to enter the draw each entrant must:

- a) be over 18 years of age;
- b) attend the "Greenfield Open Day" event on Wednesday 18th May 2016
- c) be resident in the Republic of Ireland.

2. To enter the draw each entrant (having complied with condition 1(a) to (c) inclusive) must complete the draw entry form, provide their details, answer the question correctly and submit the entry form to the competition entry box in Greenfield, Kilkenny on Wednesday 18th May 2016.

3. Directors, officers, employees, contractors or agents of Allied Irish Banks, p.l.c. and its subsidiaries, affiliates (together referred to as "AIB") or advertising or promotional agencies and members of their immediate families are not eligible to participate.

4. Closing date for receipt of entries is Wednesday 18th April 2016 at 5pm.

5. Only one entry permitted per person.

6. The winner shall be the first correct entry drawn by the Judge.

7. There is one prize of a tablet. There will be one such prize only.

(a) The prize must be collected by the winner on the night.

(b) The prize is non-transferable. No alternative prize or cash prize will be offered.

8. The judges' decision is final and binding on entrants. No correspondence will be entered into.

9. The winner of this draw will be notified on the night by phone. Notwithstanding that the winner has been declared, if Allied Irish Banks, p.l.c. discovers before the distribution of the prize that for any reason under these terms and conditions the winner should have been ineligible to enter the draw or if the entry should have been declared invalid, Allied Irish Banks, p.l.c. reserves the right to determine that the winner is disqualified.

10. In the event that the winner cannot be contacted or does not respond to the winner notification within 3 days of notification, an alternative winner will be selected from entries.

11. Allied Irish Banks, p.l.c. bears no responsibility for all liabilities howsoever arising in relation to this draw including without limitation any direct or indirect loss or damage arising from this draw.

12. Allied Irish Banks, p.l.c. reserves the right to amend, withdraw or terminate the draw or substitute any prize with another or alter the specification of the draw without prior notice.

13. Allied Irish Banks, p.l.c. may not be held liable for any breakdowns, accidents, faults or technical complications in relation to this draw. Allied Irish Banks, p.l.c. does not accept any responsibility for late, lost or misdirected entries or failure of any entry to be received.

14. The name of the winner may be obtained by any entrant to the draw by sending a stamped addressed envelope to AIB Agri Marketing Team, AIB Marketing, Block E2, AIB Bankcentre, Ballsbridge, Dublin 4. Entrants consent to the disclosure of their name as the winner (if successful). The winner may be required to take part in publicity.

15. By entering this draw all entrants are deemed to have accepted these terms and conditions.

16. The promoter is Allied Irish Banks, p.l.c. Registered in Ireland. Registered no. 24173. Registered office: Bankcentre, Ballsbridge, Dublin 4.

Allied Irish Banks, p.l.c. is regulated by the Central Bank of Ireland.

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