

Section 1

Why Dairying?

by Thia Hennessy, Brian Moran, Fiona Thorne



Introduction

Dairy farming, particularly for above average size producers, is potentially the most profitable farming enterprise of all.

- ① How does dairy farming compare with other farming enterprises?
- ② How does profitability vary between farm size categories?

Why Dairying?

① How does dairy farming compare with other farming enterprises?

Data from the Teagasc National Farm Survey shows that farm income varies widely across different farm systems and sizes.

As expected, income increases with farm size. On average, and across all size groups, dairy farmers are the highest earners.



Table 1. Family farm income (FFI) by system and farm size 2014.

Size (Ha)	10-20	20-30	30-50	50-100	>100	Hill Farms	All
Dairy	-	22,860	55,140	88,059	113,642	60,747	67,598
Cattle rearing	-	5,668	10,451	21,718	-	7,005	10,369
Cattle other	4,329	8,156	13,468	22,977	54,932	6,890	13,321
Sheep	-	11,080	19,015	19,585	-	11,820	15,065
Mixed livestock	-	-	40,181	64,877	106,437	-	56,183
Tillage	-	6,747	21,030	35,204	72,895	-	28,995
All	-	9,393	23,667	47,830	81,752	16,338	26,642

Note:

- (1) Where there are less than 10 farms in any given cell this is shown as – resulting in the “All” figure not corresponding to the individual figures shown.
- (2) Data is not applicable in blank cells.
- (3) Figures for the various farm sizes are exclusive of the data for hill farms.

Costs & profit margins on dairy farms

Results presented are based on a sample of creamery milk producers. Table 2 outlines the average output, costs and profit on these farms on a per litre and on a per hectare basis for 2014, and compares these figures to those achieved in 2013.



Table 2. Average gross and net margin (cent per litre).

	2013	2014
Milk Price	39.58	39.5
Total Gross Output	39.53	38.86
Concentrate Costs	7.14	5.49
Pasture and Forage Costs	5.11	4.94
Other Direct Costs	3.92	4.31
Total Direct Costs	16.17	14.74
Gross Margin	23.35	24.13
Total Fixed Costs	11.25	11.16
Total Costs	27.43	25.9
Net Margin	12.1	12.97
€ per hectare		
Milk Produced (litres per hectare)	10,375	10,686
Total costs (€ per hectare)	2,817	2,698
Net Margin (€ per hectare)	1,290	1,390

② How does profitability vary between farm size categories?

Variation in economic performance across dairy farms

The average output, costs and profit per hectare figures conceal the large variation in production costs between different farms. Table 3 presents data on the financial performance of the top, middle and bottom one-third of farms. Farms are grouped on the basis of gross margin per hectare, with the top third representing the most profitable one-third of farms.

Table 3. Variation in economic performance across dairy farms (2014)

	Top third	Middle third	Bottom third
Production (litres per hectare)	14,226	10,469	7,398
Gross Output (€ per hectare)	5,551	3,978	2,750
Total Direct Costs (€ per hectare)	1,955	1,493	1,191
Total Fixed Costs (€ per hectare)	1,436	1,147	879
Total Costs (€ per hectare)	3,391	2,639	2,070
Net Margin (€ per hectare)	2,159	1,338	680

Milk production per hectare was almost 100% higher on the top one-third of farms in 2014 compared to the bottom one-third of farms. Despite the substantial difference in output levels, costs of production in the top one-third of farms are just 60% higher than those in the bottom one third and as a consequence, net margin per hectare is more than 3 times higher.

Table 4 presents a selection of technical performance indicators for the top one-third of farms and for all farms in the sample. This allows us to explore the factors underlying the large variation in profit levels across farms.

Table 4. Technical performance indicators for Irish dairy farms (2014).

	All farms	Top third farms
Herd size	68	75
Stocking rate (cows per hectare)	2.06	2.51
Very good soils (percentage of farms)	57	65
Production (litres per hectare)	10,686	14,226
Milk solids (kg per cow)	375	422
Somatic cell count ('000 cells/ml)	198	191
Concentrate feed usage (kg per cow)	959	954

The top one-third of farms have an average herd size of 75 cows, compared to an average of 68 cows for all farms. This suggests that these farms may be benefiting from economies of scale, i.e. the fixed costs are being spread across a larger number of cows.

The top farms also tend to have the natural advantage of better soils and better climatic conditions (longer grass growing season and better ability to extend grazing season without damaging pastures). The NFS records data on soil types and classifies soils into very good, good and poor. As shown in Table 4, 57% of all dairy farmers operate on very good soils, compared to 65% of the top farms.

Output per hectare and milk solids per cow are higher for the top one-third of farms, while the somatic cell count is lower. There is very little difference in the use of concentrate feeds per cow between the average and the top farms, despite the significantly higher output per cow.

Why Dairying?

Conclusions

Studies (FAPRI, INRA) have concluded that expansion in production is less likely to occur elsewhere in the EU following quota elimination, so milk quota removal could improve the competitive position of the dairy sector in Ireland relative to competitors elsewhere in the EU.

The removal of milk quotas does not mean that the sector in Ireland will not face other constraints. A particular concern is the high proportion of greenhouse gas emissions in Ireland that come from agriculture, which, depending on political decision-making, could present a greater constraining influence on agriculture in Ireland than in other EU Member States, where agriculture's share of total emissions is smaller.

Editor's comment: The most recent data available at time of going to press in 2016 is for the year 2014. This was a relatively 'good' year for dairying. While overall profitability of dairying is volatile the enterprise is likely to remain the most profitable, in most years.



Section 1



Investing in Dairying

by Kevin Connolly



Introduction

Dairy farming is a capital intensive business and requires a considerable financial commitment.

- ① What should I do before deciding to invest?
- ② Which investments should I prioritise?
- ③ What is the balance between risk and return?
- ④ How should I measure my return on investment?
- ⑤ How much debt should I take on?

Investing in Dairying

① What should I do before deciding to invest?

Checklist

List all your resources

- Capital
- Land
- Buildings
- Stock
- Cash

For a **new** dairy business there is an initial cost in establishing the business. A new enterprise will require a minimum investment to pay for the establishment costs and generate a positive return for the business.

For an **existing** dairy business – establish the current level of efficiency.

Increasing scale is not always the answer – you may get a better return from improving the existing farm efficiency first, then expanding from a position of strength.

Identify main business objectives:

- The first target for any business is to remain viable by covering its business expenses.
- For long-term survival, the business must generate a surplus over business costs: profit - which rewards the owner's labour and capital.
- Consider what return on capital is needed – particularly if using borrowed funds to finance the investment in capital.

How to

Review available resources

- List land, facilities, stock and machinery.
- Establish the quality of these assets. Are they fit for purpose?
- Estimate the costs associated with keeping these assets maintained/updated.
- Consider whether the assets complement each other? For example does your chosen cow type match the land type?



- Are the assets being utilised to their full potential? If not, then why not?

Any proposed additional business resources should fit in with a **whole farm plan** of how the business is going to develop.

Buying a suitable block of land may not always be possible due to the low volume of land traded annually. The high capital cost is also a significant barrier. Most businesses will start with a certain amount of owned land and supplement this by renting/leasing land. The lease/rent option allows the farm to exploit the land area and build up the production base through increased cow numbers and increased litres sold.

The options for land acquisition are:

- outright ownership through purchase/inheritance/gift
- lease or rental
- share farming
- partnership.

② Which investments should I prioritise?

On-farm investments can be categorised as investments that will:

- be necessary for the farm to remain in business
- improve output or reduce costs
- improve labour efficiency
- allow new opportunities to be availed of e.g. a new enterprise.

Every asset has a cost associated with using it in the business. These costs can be easily identifiable costs including acquisition costs such as loan interest charges and rental/lease cost or asset maintenance costs such as repairs and enhancement costs.

Where the investment is going to be financed by debt it must generate sufficient free cash to meet the interest plus capital repayments. For fully owned high value assets, such as land, it is useful to consider the opportunity cost of their use. The opportunity cost for land is the market value rental cost of an equivalent land block.



Key performance indicator



Identify the asset with the highest capital cost – usually land followed by buildings/facilities, machinery and livestock. Aim to maximise the income-generating potential of this asset by focusing the business objectives on the full utilisation of this asset.

Checklist



Evaluating an investment:

- Does this investment complement existing assets and allow better utilisation of all business assets?
- Will this investment generate additional net income? Will it boost cash flow?
- Are there additional costs associated with utilising the asset to its full potential?

Golden rule for dairy new entrants

Get established by getting the cows in place first.

The biggest threat to new entrants to dairy farming is taking on too much debt too early to purchase land, buildings or expensive machinery. **Remember the cows are the key income earning asset – get those in place first!**

Focus investment on increasing productivity

Productivity is about how efficiently a business can turn its inputs, such as labour and capital, into saleable product.

Productivity improvements can be achieved by:

- increasing scale to maximise the productive potential of existing assets
- using latest technology or practices in production
- targeting production at least cost.

Bear in mind that some productivity improvements come many years after the system changes are implemented. Indeed with some productivity gains there may be a period after changes are made when cash flow and returns will suffer until the business adjusts to the changes.

Targeting more production to better utilise available resources must be tempered with the risk of pushing too far towards the limits of the asset's production capacity. Exceeding these limits may put the business at risk should milk price, weather, interest rates, disease etc. interfere with expected returns. It is wise to always leave a safety margin.

③ What is the balance between risk and return?

Most businesses rely on a mix of equity (own funds) and borrowed funds to finance their operations. A common objective would be to see invested capital generating a return which matches the returns achievable from alternative investments and preferably outperforming them.

Risk and return are closely linked – usually the higher the risk, the higher the return expected (although not necessarily achieved) since the investor will expect an adequate reward to compensate for the risk taken.



Investing in Dairying

④ How should I measure my return on investment?

There are a number of measures used to assess percentage returns from operating a business. No single measure will give the full picture and it is important not to focus purely on a given percentage return while ignoring overall profitability or cash flow.

Rate of return on assets

This return rate is not influenced by whether the assets used in the business are owned outright or are partly financed by borrowings - it is the return to all assets used in the business.

$$\text{Rate of return on assets} = \frac{\text{Net Income} + \text{Interest paid} - \text{unpaid labour charge}}{\text{Average of total farm assets (at start and end of year)}} \%$$

Net farm income is what is left after total farm expenses (including depreciation) are deducted from total farm income, and an allowance is made for any increase or decrease in the value of stock over the year. Interest charges are added back in, which removes the effect of whether the assets are owned or borrowed for, from the return calculation.

An estimated charge for the unpaid labour (usually supplied by the farm owner and family) is also deducted from the farm income figure. This figure can be hard to pin down as most farming businesses do not pay the owner-operator a salary. By default this figure is often taken to be the annual drawings figure for the business which is taken out to cover family living expenses. Return on assets typically ranges from 4% to 8%.

Rate of return on equity

Equity (also called owner's capital or net worth) can be defined simply as the owner's stake in the business. Or, put another way, the total value that the owner could take away from the business if all the assets were sold and all the liabilities paid off. A typical range for return on equity would be 3% to 10%.

$$\text{Rate of return on equity} = \frac{\text{Net income} - \text{unpaid labour charge}}{\text{Average of (farm assets value - farm liabilities value) at the start and end of the year}} \%$$

⑤ How much debt should I take on?

Intelligent use of debt can allow expansion through investment without compromising the stability of the business. For most businesses debt is an essential part of any investment plan, as few will have sufficient funds to invest from existing cash reserves.

There are a number of key factors to be considered in relation to debt.

- The level of debt relative to the total value of all business assets.
- The interest rate charged to avail of the debt finance.
- The term over which repayments will be made – match the repayment term to the lifespan of the asset in the business.
- The existing (and additional) repayment capacity to meet debt repayments.

Section 1



How Competitive is Ireland as a Dairy Producer?

by Trevor Donnellan, Thia Hennessy, Michael Keane, Fiona Thorne



Introduction

Ireland has comparatively high land rental and labour costs – a significant handicap in competitiveness terms. Larger Irish dairy farms are more internationally competitive than average-sized Irish dairy farms.

- ① How do we measure competitiveness?
- ② How do Irish dairy farms measure up at EU level?
- ③ How do Irish dairy farms measure up at global level?
- ④ What are the main factors affecting our relative competitiveness?

The Competitiveness of Ireland as a Dairy Producer

① How do we measure competitiveness?

Comparing the economic performance of dairy farms in Ireland with dairy farms in other countries might sound straightforward. However, in reality it is quite complicated because one needs to take into account specific factors that exist in each country, e.g. differences in types of feed used, milk constituents, calf values, labour costs, land rental etc. To get around these difficulties we use financial data with common accounting standards from the European Commission Farm Accountancy Data Network and the International Farm Comparisons Network.

② How do Irish dairy farms measure up at EU level?

- Costs and returns in Ireland and a number of key competitor countries were examined, namely Belgium, Denmark, France, Germany, Italy, the Netherlands and the United Kingdom.
- In comparison with the average dairy farm in these countries, Ireland has amongst the lowest cash costs relative to output value.
- However, the costs of the farmer's own labour, owned land and owned capital must be taken into consideration, because, to make a true profit over the longer term, a dairy farm needs to cover its full economic costs.
- When the full economic costs of doing business are taken into consideration, including a payment to the dairy farmer for his owned land, labour and capital, the average-sized Irish dairy farm (55 cows) is considered to be a high-cost producer in the EU15. This is because land and labour costs, are high in Ireland compared to competing dairy producers in the EU.
- Looking at cash and economic costs across the EU15 for larger-sized farms (farms with 50 to 99 cows), Irish farms perform better against comparable large farms in the EU.

③ How do Irish dairy farms measure up at global level?

- Ireland was also compared with a number of competitor countries outside the EU, namely Argentina, Australia, Poland, New Zealand and the USA.
- Comparing the average dairy farm in these countries on a cash basis alone, Ireland is in quite a good position. Ireland has amongst the lowest cash costs internationally.
- However, in common with the analysis for the EU15, when costs for the dairy farmer's owned land, labour and capital are added into the analysis, the ranking of the average Irish dairy farm deteriorates and average Irish dairy farms tend to be amongst the higher cost producers across the countries examined.
- Again the analysis was repeated looking at larger farms. In the Irish case, a 110 cow farm was used for comparison with larger dairy farms around the world. In this comparison the larger Irish dairy farm performed quite well, which indicates that the small scale of the average Irish dairy farm (by the standards of global competitors) is a key factor in determining the competitive position of these farms.

④ What are the main factors affecting our relative competitiveness?

Against this background, what are the main strengths, weaknesses, opportunities and threats to the competitiveness of the Irish dairy sector in a post quota world?

Strengths

- Grass-based system of production leading to relatively low cash costs internationally.
- Comparatively low exposure to adverse movements in concentrate feed prices due to upward movements in energy prices.
- Low carbon production per kg of milk highlighting the sustainability of Irish dairy farming production systems.

Weaknesses:

- High land rent and labour costs in Ireland contribute to high total economic costs of dairy production when a return to owned land and labour are added in.
- Historically relatively low stocking rates and milk yields per hectare on Irish dairy farms must be considered a contributing factor to the relatively high total economic costs per unit of output in Ireland.
- The dairy sector in Ireland is vulnerable to the effects of low milk prices in periods when international dairy commodity prices fall due to the high export focus of the Irish dairy sector.

Opportunities:

- Capacity to increase scale of production post quotas.
- Capacity to increase productivity as size of the average farm increases and economies of scale can be exploited.
- Many opportunities lie ahead in the higher value-added market and moving up this value-added chain presents a real growth opportunity for the Irish dairy sector.

Threats:

- In the longer term, when expansion of the dairy sector is considered, the full economic costs must be evaluated, given that extra land, labour and capital will be required.
- Exposure to excess volatility in dairy product prices.
- Production increases arising from quota abolition and the move towards the production of more complex dairy consumer food and ingredients will require a reevaluation of current processing capacity.
- Increases in Irish milk production reflecting relatively strong dairy returns are likely to be matched by increases in other producing countries where environmental limitations are less restrictive.
- In the longer term, the main threat to the growth of the Irish agricultural sector is likely to come from policy reform. In particular, the need to meet our environmental commitments while protecting the sustainability of the sector (in the context of further freeing up of international trade rules) may prove challenging.





Section 1

Potential Markets

by Mark Fenelon, Phil Kelly, Maeve Henchion, Paul Ross



Introduction

Ireland exports 90% of milk output. Every extra litre of milk produced as part of the Food Harvest 2020 expansion must find a consumer outside of Ireland.

- ① What are the key trends in global markets for dairy produce?
- ② What are Ireland's strengths, weaknesses, opportunities and threats as a dairy producer?
- ③ What are the high margin/profit dairy products?
- ④ What is our product mix now?

Potential Markets

① What are the key trends in global markets for dairy produce?

The world's population is growing (expected to reach nine billion by 2050 from its current level of just under seven billion). This population growth will take place almost entirely outside of Europe since population levels here are expected to be flat or possibly decline slightly. A significant part of the dairy industry should therefore focus on ingredients for foreign markets, including Asian countries.

Fresh milk requirements in Europe are not likely to grow significantly, but the cheese market is changing and opportunities are arising for novel ingredients. The Irish dairy industry forecasts a substantial expansion in cheese production in the next 10 years both in terms of overall volume and specific varieties. The trend is towards reduced fat, low-salt cheese variants to address growing health concerns, as well as addressing longer term cheese diversification opportunities. Globally, most of the growth will not be in cheese but in milk powders and butter oil.

② What are Ireland's strengths, weaknesses, opportunities and threats as a dairy producer?

Strengths

Ireland has well-established advantages including low-cost pasture-based feeding, low carbon footprint and a highly sustainable and safe milk supply. Ireland's high quality milk is produced in close proximity to the processing facilities, ensuring security of supply and flexibility during processing.

Ireland has a sophisticated dairy industry with a number of indigenous players such as Carbery, Dairygold, Glanbia and Kerry with global reach.

Much of the foundation to capitalise on foreign markets has already been laid. For example, Ireland is playing an increasing role as host to major multinational infant milk formula (IMF) manufacturers who are exporting IMF products to both EU and non-EU markets.

The decision by companies, such as Danone for example, to expand its Irish operations by setting up what will be one of the largest IMF manufacturing facilities in Europe is testimony to the company's belief that it can substantially service long-term future market opportunities from its base here.

Multiple factors impact on decisions by multinational companies (such as the infant formula and food ingredients producers) when committing such inward investment in Ireland. National infrastructure supports such as the knowledge base that publicly-funded research generates is appreciated significantly by local and multinational companies working within Ireland. These tap into the resources and skills in dehydration technology, IMF processing, cheese technology and ingredient innovation through commissioning of contract research.

Weaknesses

A critical mechanism in effective use of a growing milk pool is to dry the milk into powder in order to reach distant markets with variable climates. Ireland has significant processing infrastructure to develop new functional ingredients which provide the nutritional base for food products assembled elsewhere in the world. However, capital investment in membrane and drying technology is required to increase capacity if the milk pool is to expand and these next generation ingredients are to be developed.

Opportunities

At a time when global dairy markets are expanding due to increased consumption in Asia, it is worth reflecting on the significance of cheese, ingredients, functional foods and infant milk formula (IMF) manufacture in Ireland and the opportunities they provide.

The long-term opportunity for Ireland as a dairy producer and exporter is to ship its perishable food products in dehydrated form to markets with expanding populations and increasing consumption. With the abolition of quotas, milk production has the potential to expand by 50% by the year 2020 (Food Harvest 2020). There is a need for targeted research on milk processing if the Irish dairy processing industry is to respond to this increase in supply.

Emerging markets are located mainly outside Europe, so the only technically feasible way to deliver Irish milk to these distant markets is in dehydrated (spray-dried) form, as well as products such as butter or cheese. With the development of powder-based functional ingredients; distant markets are now within reach. Many of the Asian markets do not have a tradition in cheese manufacture, therefore the introduction of new products from rehydration of powders is an obvious opportunity.

Ireland has a wealth of knowledge in both dairy ingredient and IMF formulation for supply to customers in overseas foreign markets. Opportunity exists for Irish dairy product manufacturers to formulate and process according to customer specification. Promising products include concentrated dairy protein powders such as milk protein concentrates (MPC's), whey protein concentrates (WPC's) and isolates (WPI's) for sports, medical and recreational applications. The largest growth market in the last ten years for whey-based products has been the sports and fitness sector and this is set to continue.

Threats

Over-reliance on the UK market outlet for current and expanded cheddar cheese exports at a time when market signals suggest that consumers are becoming increasingly loyal to UK-sourced products.

③ What are the high margin/profit dairy products?

Supplying the local liquid milk market requires less than 15% of total milk supply. To utilise the surplus, a range of processed products are needed. In cheese, diversification into new varieties which can be manufactured on existing equipment in Ireland can provide higher margins and opportunities. Cheeses with higher moisture content and with health benefits such as low fat and low salt are trends that can increase the value of existing cheeses.

During the last two decades, whey protein products have become major commodity products for Irish ingredient manufactures. Providing customers with exact product properties in complex food products can be a major competitive advantage.

Hydrolysed whey products and those with targeted functional and health associated properties can offer higher margins than commodity-based ingredients. High protein ingredients with good functionality that can be used across a variety of food applications such as medical, sports and nutritional can provide higher margins for dairy processors. The route to these markets has already been opened up by major ingredient manufactures through the acquisition of specialist ingredients companies abroad.

Ingredients used in infant formula can be considered high margin. There are considerable benefits to the Irish dairy processors in working with IMF manufacturers, given the volumes of milk used, and the continuing demand for new material inputs with new functional benefits. IMF producers provide important routes to market with high profile, branded formulations which meet the exacting standards demanded in neonatal nutrition.

New developments in the area of separation and drying technology provide opportunities for development of 'higher margin' dairy ingredients. The scope for these ingredients includes the high value infant formula/nutritional sector as well as new opportunities for cheeses, yogurts, nutritional beverages, sports drinks etc. The key to these ingredients is that they will have attributes which will allow them to be directly used for a variety of applications – e.g. powders that turn into cheese or yogurt with new functional attributes.

Ireland and Irish dairy farmers will benefit from leveraging the strength of the global brands and market reach of locally-based specialized multinational dairy processors. The knowledge that drives this model relies extensively on the technological skills and expertise of all stakeholders to ensure that a pipeline of innovative ideas and ingredients enable these multinationals to maintain their competitive advantages.

④ What is our product mix now?

Historically, Ireland's dairy product mix centred on commodities such as butter and milk powders with some efforts made in the last decade to become less reliant on these low margin products. The continued removal of price supports in EU dairy markets and ongoing market pressures is encouraging the industry to produce more value-added products. All dairy products are expected to increase - by 38% for WMP and butter and by 33% for cheese.

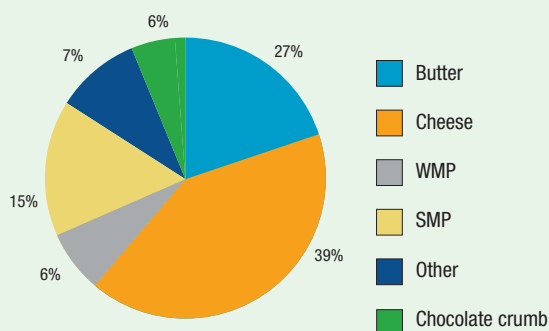
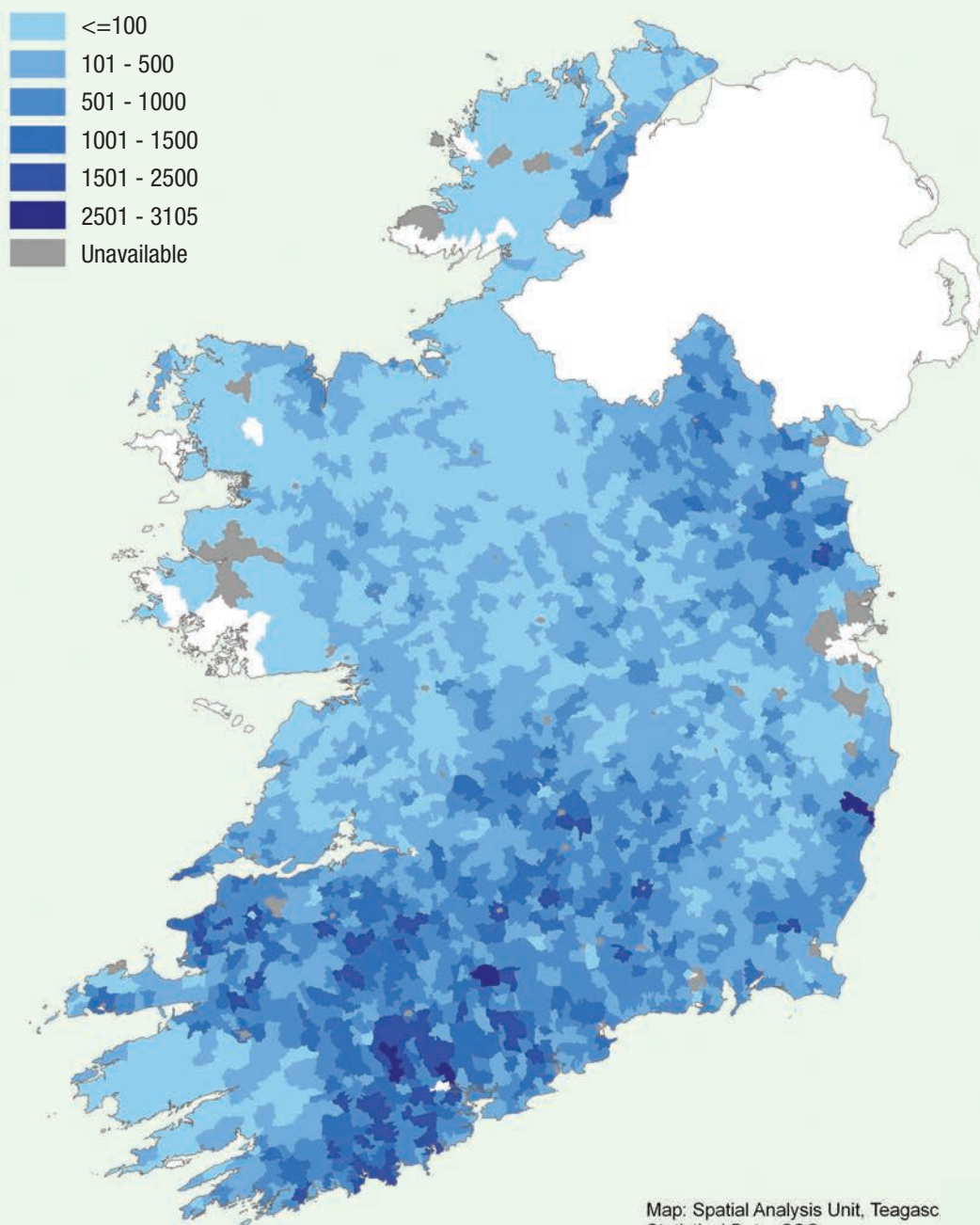


Figure 1. Irish product mix in 2014.

Courtesy of Ornuia (2016).

Dairy Cow Numbers by ED



Section 1

Choosing a Dairy System

by Joe Patton



Introduction

The optimum milk production system for any dairy farm is the most profitable and sustainable combination of calving pattern, stocking rate, and feeding budgets.

- ① What factors should I consider when deciding on a dairy system?
- ② What are the pros and cons of high input and low input systems?
- ③ What system is most appropriate for someone new to dairying?
- ④ Do I need to match type of cow to the system?

Choosing a Dairy System

① What factors should I consider when deciding on a dairy system?

The final decision will take into account a number of factors.

- **Milk price volatility** creates a threat of intermittent cash flow and liquidity problems on-farm. Base production costs must be controlled to minimise difficulties when milk price is low. Systems with high variable costs or fixed costs are more vulnerable to volatility.
- **Milk pricing and supply pattern** influence calving pattern and feed budgets. Compact spring calving is best if substantial winter supply bonuses are not available. Early season bonuses/peak penalties may influence start-of-calving date but are unlikely to warrant significant change to the compact calving model.
- **Soil type and grass growth patterns** dictate supply and seasonality of grass availability. Farms with lower grass growing capacity will have a lower optimum stocking rate. Heavy soils and shorter growing seasons may mean that a somewhat later median calving date is preferable.
- **Grazing platform and farm fragmentation** determine the scale of the enterprise and the role of alternative forages in the system. Farms with adequate grazing area can set optimum stocking rate based on annual grass growth.

Fragmented farms should calculate the cash cost/opportunity cost of importing forages from external blocks, relative to potential extra milk sold. Increasing pasture eaten on the grazing block is important in both cases—alternative forages should not displace grazed grass from the diet.

- **Supply and cost of external feeds** are important in deciding the role of supplements in the feed plan. Some feeds can offer good value in the short-term, but these should not form an important part of the system if supply is inconsistent or price is variable. Reliance on purchased feeds increases exposure to low milk price.
- **Simplicity of management** increases the likelihood of a successful dairy system. Compact calving, fertile cows, long grazing seasons, and fewer alternative feeds, all contribute to a streamlined system. Labour and purchased inputs are likely to be reduced as a result.

② What are the pros and cons of high input and low input systems?

For comparison, low input systems are defined as having more than 80% of the diet as forage from the grazing platform, and high-input systems are defined as having more than 40% of the diet as imported feed, with maximum use of grazed grass in both cases.

Low input system

Pros:

- Lower feed cost per litre limits exposure to milk price volatility.
- Smaller percentage of diet imported reduces impact of feed cost increases.
- Reduced machinery and contractor costs.
- Simplified grazing and feed management.

Cons:

- Reduced milk solids output per grazing hectare.
- Grazing platform limits scale and potential to dilute overhead costs.
- Less capacity to drive profit at high milk price.

High input system

Pros:

- Greater milk solids output per grazing hectare can dilute overhead costs.
- Increased profit potential at high milk price.
- Building stock resources on farm.

Cons:

- Profitability exposed to fluctuating milk and grain prices.
- Maintaining pasture efficiency while buffer feeding can be difficult.
- High stocking rates are difficult to manage in poor ground conditions.
- Increased machinery, contractor and labour costs.

3 What system is most appropriate for someone new to dairying?

Deciding on the most appropriate system for a start-up dairy farm is an early and important step in the development process. All the major component decisions should flow from a system template set down at the outset.

- A simple rule of thumb is that the system should maximize grass eaten per hectare. Decisions on high input versus low input systems should only be made when the grazing platform is being utilised to the limit.
- Cash flow and profit margins will face pressure in the early years of the business. The production system should keep cash costs low by maintaining a high proportion of grazed grass in the milking diet. Compact calving in spring is important here.
- Milk price changes at a greater pace than a system can be altered, so the system should not require major adjustments in response to price fluctuations (up or down). A stable and repeatable base system is preferable.
- Some conversion farms may plan to retain part of a previous enterprise and blend it with the dairy unit, e.g. dairy bull beef or whole-crop cereals. Are these profitable stand-alone enterprises? Do not allow unnecessary complications to interfere with the core objective of converting grazed grass into milk.
- Herd fertility will not improve by feeding or management alone. The breeding policy should produce daughters with a high EBI fertility sub-index (greater than €120). Place a priority on fertility and survival traits when purchasing stock.
- If fertility is a common breeding goal, what differences in cow type must be tailored for particular systems? The principal trait of concern here is milk yield. Lower input systems require cows that efficiently convert high forage diets into milk solids. This is often misinterpreted as selection for low yielding cows, when the objective is higher milk solids yield from a given volume, achieved with minimal concentrate feeding.
- Higher input systems have traditionally been likely to sell a proportion of output as liquid milk. This placed the focus on individual milk volume with less emphasis on composition or fertility. However, a move to solids-based pricing and the potential to expand post-quota means that breeding for milk solids content is now essential. High input herds may benefit from a greater yield potential, but not at the expense of other traits.
- In summary, breeding for fertile cows that produce high solids milk from forage-based diets is the route to profit for all dairy herds in Ireland. Differences in cow type between systems can be overstated, for reasons that may not be profit-driven.

4 Do I need to match type of cow to the system?

What should be taken into account when choosing the best type of cow for a system.

- A short calving interval (fewer than 370 days) and low culling rate for infertility (less than 10%) are essential for profit on all farms regardless of stocking rate, calving pattern or land type. Unstructured calving occurs on many farms due to poor herd fertility rather than as a planned approach. This erodes profit and is to be avoided. Extended lactations and recycling infertile cows do not offset the financial losses.

Organic dairy production does not fall within the scope of the Teagasc Dairy Manual but Teagasc does provide advice to organic milk producers.



Section 1



Liquid/Winter Milk Production

by Joe Patton



Depending on product mix, milk processors offer various schemes to secure sufficient milk during the winter months. Some schemes operate formal contracts between farmer and processor. These contracts may be traded between farms.

- ① How do I decide if winter milk production is for me?
- ② How do I choose the best calving pattern?
- ③ What's the best grazing plan and feed budget to match the calving pattern?
- ④ What's the best cow for liquid/winter milk production?
- ⑤ How do I master fertility performance in a liquid milk herd?

Liquid/Winter Milk Production

① How do I decide if winter milk production is for me?

Key question



- What extra gross income is generated from contract milk?
- What additional costs are necessary to produce this milk?
- Is the potential difference in cash margin enough to reward extra labour and capital?
- Is liquid/milk production necessary to manage a stocking rate issue?

Alternative milk pricing schemes

Depending on product mix, processors offer various schemes to secure sufficient milk during the winter months. Some schemes operate formal contracts between farmer and processor. These contracts may be traded between farms.

Different contracts require different patterns of milk supply. Some farms sell milk under multiple pricing schemes simultaneously. The aggregate supply requirement across the year should be calculated in such cases.

Average and marginal milk price

It is important to understand the difference between the marginal and average milk price. In the example shown (Figure 1), 37% of milk is being sold at liquid price, 15% at winter bonus price, and the remainder at manufacturing price. This gives an average milk price of 33c/l. However, any additional milk produced through increased concentrate feeding etc, will be sold at the marginal price of 29.5c/l. Any calculations on the economics of feeding should therefore be made at the marginal (29.5c/l) rather than the average (33c/l) price.

'Average winter milk price is usually higher if litres sold at the marginal price are kept to a minimum.'

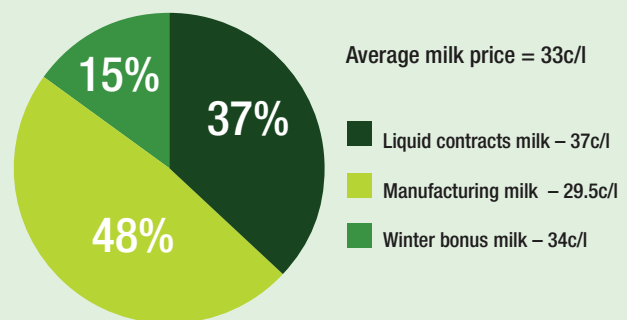


Figure 2. Average and marginal milk price in a dairy milk collection

Non-seasonal milk pricing structures

All-year-round liquid contract

- Fixed daily volume to be supplied year-round
- Liquid milk price paid as:
 - i) Manufacturing price plus bonus
 - or
 - ii) Flat price
- Surplus at manufacturing price

Winter milk contract

- Bonus during winter months if supply conditions are met
- Price usually set as manufacturing plus bonus
- No contract for summer months

Fixed cash quantity

- Fixed cash quantity divided across surplus-to-contract winter milk
- Bonus per litre may vary by month
- Payments cease when total cash quantity is exceeded

Targeted incentive scheme

- Price bonus for set milk supply during off-peak month(s)
- Designed to encourage earlier calving and longer lactations
- Unlikely to warrant significant changes to system

Different contracts require different patterns of milk supply. Some farms sell milk under multiple pricing schemes simultaneously. The total milk supply needed for each day of the year should be calculated in such cases.

2 How do I choose the best calving pattern?

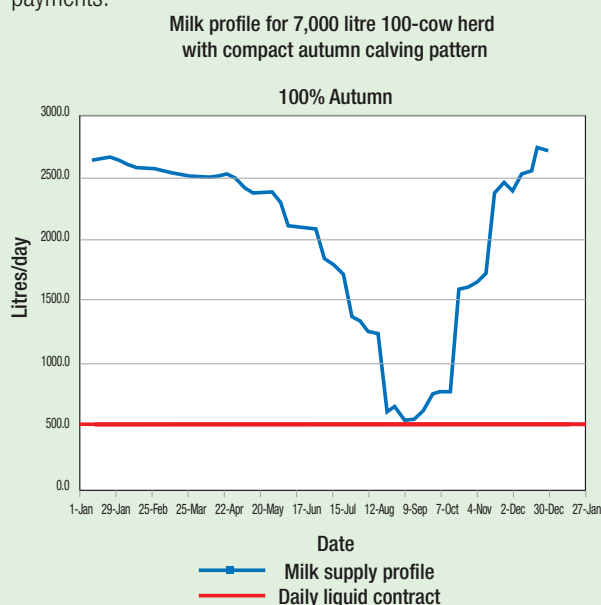
Key fact

A well-planned calving pattern should:

- produce a milk profile that meets supply contracts
- optimize total feed costs
- minimize labour input per cow.

Calving pattern alternatives

Compact autumn: 100% of the herd calved in 12-16 weeks in autumn. Calving starts in early-mid September, completed by December. This works well where a minimum winter milk supply is required to achieve winter bonus payments.



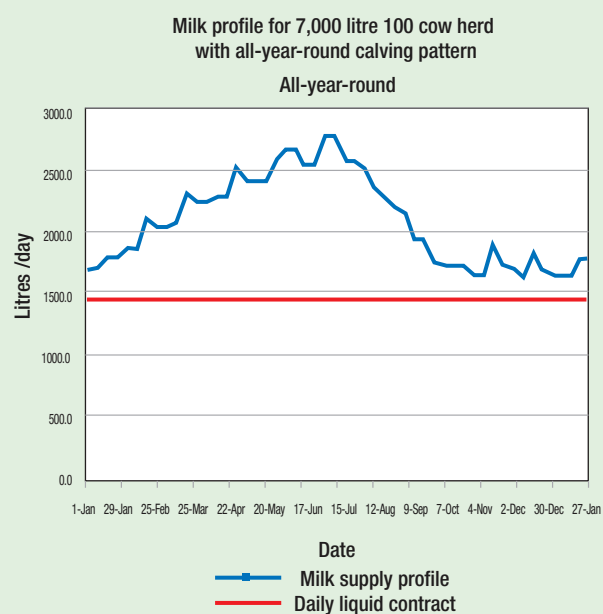
Pros:

- The herd is managed as a single batch for feeding and breeding.
- Spring and summer labour is greatly reduced.
- Meal feeding at grass can be reduced as cows are post-peak yield.
- Milk production per cow follows a flat lactation curve.

Cons:

- High % of milk is produced during costly indoor period.
- Breeding season takes place indoors, so heat detection is more difficult.
- Good fertility is crucial to avoid high culling rates.

All-year-round (AYR): Cows calving for 10 months of the year, or more. Applicable if contract milk is a large percentage (greater than 75%) of output, or if profit is improved by feeding high levels of supplement during grazing season. Neither condition routinely exists on Irish dairy farms so AYR unlikely to be optimal. Where AYR is required, maintaining calving interval of less than 370 days is important.



Pros:

- Low peak to trough ratio - high percentage of milk can be supplied as flat contract.
- Consistent labour demand - may suit a work roster of fulltime employees.
- Longer window of opportunity to get cows in-calf.

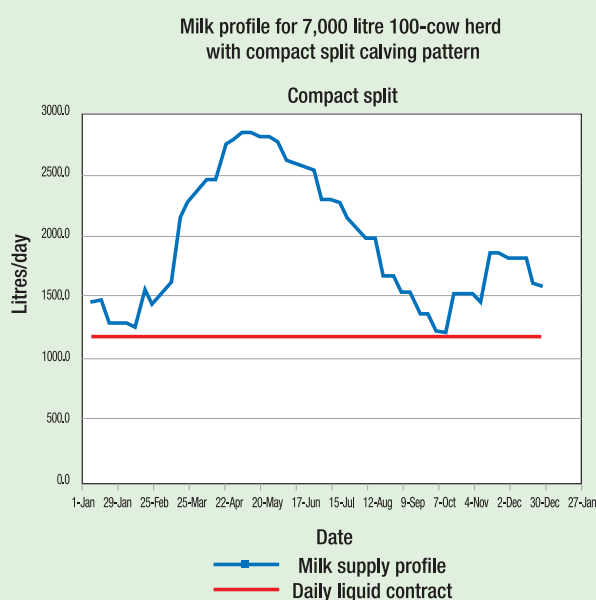
Cons:

- Total workload per cow is significantly increased.
- Cows managed as individuals or multiple groups - complex system.
- Efficient concentrate feeding at grass difficult due to range in lactation stages.
- There is a tendency for longer calving intervals.
- AYR systems tend to have the lowest profit per litre.

Liquid/Winter Milk Production

Compact split:

This is a compromise between compact autumn and AYR calving. Calving is confined to two distinct blocks in autumn and spring. Duration and percentage of herd calving in each block should reflect milk contract conditions. A proportional split may need to be adjusted if herd size increases and liquid contracts are static.



Pros:

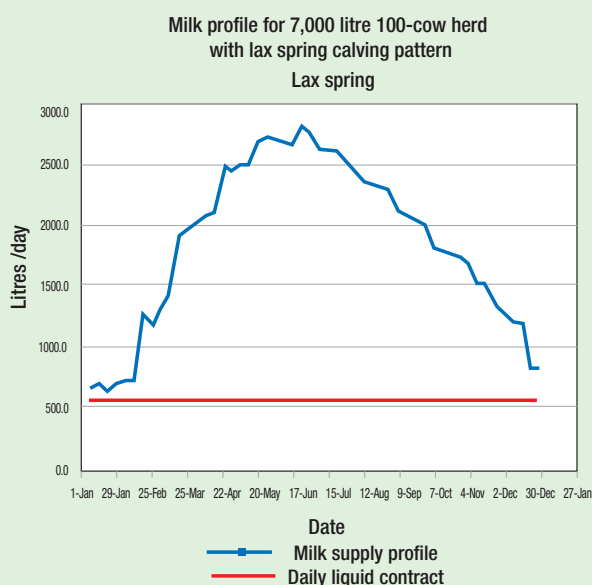
- Has a high potential flat contract supply.
- The herd can be appropriately managed as two batches.
- The cost of poor fertility can be partially offset by transferring non-pregnant cows from one breeding season into the next.

Cons:

- Autumn grazing is complicated by fresh and late lactation cows in same herd.
- The full economic cost of long calving intervals may go unchecked.
- There is a risk of drift to unstructured AYR calving if duration of blocks is extended.

Lax spring:

This is an option if liquid milk has declined significantly as percentage of total output, particularly in the context of herd expansion. Autumn calving is discontinued and late spring/summer calved cows are milked through the next winter to fulfill supply contracts.



Pros:

- One calving season reduces autumn labour.
- Simplified autumn grazing.
- Late spring calving cows have increased economic value in the system.

Cons:

- May-June calved cows have 8-10% lower annual milk yield.
- A high proportion of summer calving cows decreases capacity to exploit spring grass.
- There may be potential quality issues in winter with late lactation milk.
- It is difficult to structure the breeding season to guarantee the correct number of late calving cows.

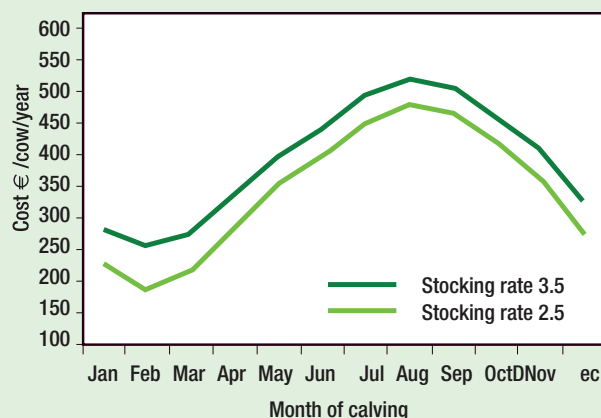
Table 1. Calving patterns: Cows calving per month and milk profile statistics.

	Calving patterns			
	100% Autumn	AYR	Compact split	Lax spring
January	-	11	4	12
February	-	12	18	32
March	-	10	26	24
April	-	8	12	15
May	-	10	-	10
June	-	9	-	7
July	-	-	-	-
August	-	-	-	-
September	24	8	6	-
October	40	12	15	-
November	28	9	19	-
December	8	11	-	-
Total cows	100	100	100	100
Potential AYR contract milk	25%	77%	60%	30%
Peak Trough Ratio	5.1	1.72	2.31	4.2
% Milk Oct- Feb (5 Months)	45	34	32	20

Feed cost per month of calving

- Annual feed budget cost per cow changes depending on month of calving.
- These differences form the basis of building the most cost-effective calving pattern.
- February calved cows are the cheapest to feed, August calved cows are the most expensive.
- Differences are due to proportion of grazed grass in the total diet.
- As stocking rate rises, differences per month become less, but are still significant until pasture becomes less than 50% of total diet.

Purchased feed cost per month of calving for a winter milk herd at two stocking rates



Liquid/Winter Milk Production

③ What's the best grazing plan and feed budget to match the calving pattern?

Key fact

The milk production calendar for liquid milk herds can be divided into four separate phases:

- Indoor feeding
- Spring grazing rotation
- Mid-season grazing
- Autumn rotation.

Indoor Feeding

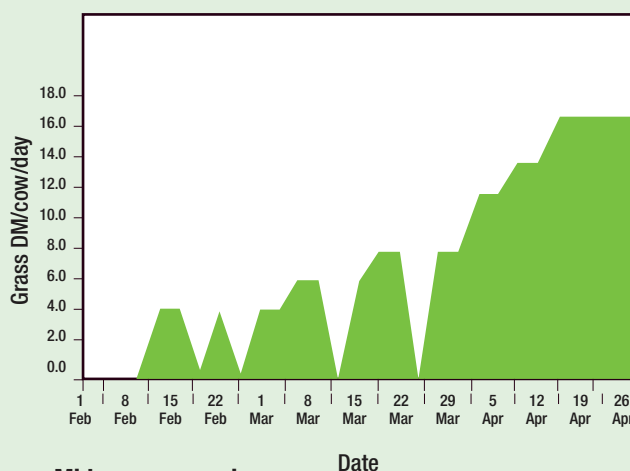
- Quality forages are the cornerstone of cost-effective indoor feeding.
- Winter diet management starts with silage crop management in spring.
- The focus is on getting the correct overall diet composition - energy, fibre, protein and minerals.
- Where diet composition remains constant, modest changes to ingredients will not make much difference to cost or performance.
- Avoid complicated feed plans. Four diet ingredients should suffice.
- Where concentrate <50% of diet DM, there is no performance difference in feeding concentrates in-parlour or as part of a mixed diet.
- The cost of overfeeding mid-late lactation cows can be considerable. Where different lactation stages are housed together, minimize the proportion of concentrate fed at the barrier and used in parlour feeding. Compact calving patterns make feeding decisions much simpler.

Spring grazing rotation

- Early grazing means better growth and a long interval to 2nd grazing, improving April grass supply.
- Autumn calving cows create high spring demand. This should not mean later turn-out. Commence grazing in early to mid-February where conditions allow.
- Use a simple rotation plan to allocate a set percentage of the farm each week.

- Balance for different feed demand and stocking rates by adjusting the indoor diet allowance.
- Offer minimum 4-5kg grass DM per grazing bout. Graze 4-5 days in the early weeks if supply is limited and balance with indoor feeding.
- Indoor diet should be set to encourage grazing to 4cm. Give a full indoor ration on non-grazing days.

Spring (Grazing budget for winter milk herd)



Mid-season grazing

- Grazing management is similar for spring and autumn calving herds. The objective is to maximize milk produced from grazed grass.
- Autumn-calving cows have a flat lactation curve. It is possible to achieve milk yield (>85% of peak) with autumn calved cows grazing quality pasture in mid-lactation.
- Maintain DMI by adequately supplementing when grass shortages arise.
- Routine buffer feeding with extra forages is unlikely to be necessary, except at high stocking rates (>4.5 cows/ha on total grazing platform).

Autumn rotation

- Autumn grass has high crude protein but 15-20% lower energy than spring grass.
- High pre-grazing yields arise when building grass supply for spring herds, however freshly calved cows should not be consistently offered autumn grass >1,700kgDM.

- Where >50% are autumn calving:
 - Grass cover should not be allowed to exceed 800kg DM/ha in mid-September. Remove surpluses in late August if required. Maintaining a lower farm cover during September generally means grazing finishes by early November, but this is balanced by earlier turn-out.
- Where <50% are autumn calving:
 - Autumn grass should be managed to suit the bulk of the herd. This means building cover to sustain a long grazing season for spring calved cows.
 - Avoid problem of grazing high covers with freshly calved cows by moving to later autumn calving.

④ What's the best cow for liquid/winter milk production?

Key fact

The optimum cow for liquid milk production should have a good balance of the most important economic traits. Liquid milk contracts are for a fixed volume, and as such there is no extra profit *per se* in having higher yielding cows, unless higher yields lead to cost reduction. However, many farms have unprofitable all-year-round calving due to lack of control on herd fertility. This needs to be addressed through genetics as well as management.

⑤ How do I master fertility performance in a liquid milk herd?

How to

Breed the ideal cow for liquid/winter milk

- Most liquid milk suppliers are now paid on the basis of constituents, so using positive fat and protein sires is essential. A high EBI milk index will identify suitable sires.
- Good milk yield is important for profit, but most herds do not achieve their current genetic yield potential due to infertility, nutrition etc. The economic response to selecting heavily on yield is likely to be poor.
- The most profitable cow calves once every 365–370 days. This is a major challenge and will not be achieved by feeding or fertility management alone. Breeding more fertile cows should be a top priority.

- Research and on-farm experience shows that using AI sires with a negative calving interval will improve daughter fertility rates across all management systems. The EBI fertility index will identify suitable sires.
- Replacement costs are high on most liquid milk farms. Culling rates are reduced with low cell count, good locomotion and improved ability to go back in-calf. Using AI sires with high positive survival score will improve these traits in their daughters.

Targets for bull selection for liquid milk herds

Fertility

Calving interval -7 days or less

Survival +4.0%

Overall fertility index greater than €160

Calving difficulty <1.8% for heifers (based on survey data)

Milk

At least +30kg combined fat and protein

+160kg to +180kg milk adequate for high yielding herds

Milk protein +0.12% or higher

Overall milk sub-index +€90 or more

Use a team of 5-6 bulls across the herd. The ICBF active bull list can be used to identify bulls matching these criteria.





Section 1



Farm Partnerships and Other Business Options

by Thomas Curran



Introduction

Thinking 'out of the box' with regard to business operating arrangements can help overcome limitations including, labour, land, lifestyle and capital.

- ① Should I form a registered farm partnership?
- ② How could I benefit from forming a family registered farm partnership?
- ③ Should I move from being a sole trader to a company?
- ④ Is share farming for me?

Farm Partnerships and Other Business Options

① Should I form a registered farm partnership?

Key Question



Entering into a registered farm partnership with another farmer could provide:

- an avenue of entry into dairy farming for young trained farmers
- increased grazing area around the milking parlour
- increased labour availability and efficiency
- improved work/life balance
- better access to existing or improved buildings and facilities
- improved management/skills pool
- opportunities for work specialisation
- reduced need for investments in buildings and machinery
- special benefits such as access to EU/government supports or tax benefits
- improved future profitability, viability and sustainability for your family farm.



How to



Establish a registered farm partnership with another farmer

- Identify a like-minded farmer/landowner partner. This may take some time, so spread the word that you are seeking a business partner.
- Previous co-operation or working relationship is an advantage.
- Visit each other's farms. These visits should include meeting relevant family members.
- Farmers (including spouses and other family members where relevant) should share their views on their current farming/business goals and what each would hope to achieve from a partnership.
- Each party should consult with their adviser, accountant and solicitor.
- To progress matters they should meet on a weekly basis. They should discuss/agree matters such as:
 - the level of performance and profitability on each farm
 - the assets each person could bring to the partnership
 - what each person would like to achieve from the proposed partnership
 - plans and targets for the partnership. (A financial plan should be part of this)
 - possible roles and responsibilities of each proposed partner in the partnership
 - the profit-sharing arrangement
 - an adjudicator in the event of a dispute
 - a starting date.
- It is now time to put all the details agreed into a formal written agreement with the assistance of solicitors and accountants.
- After signing off on the written partnership agreement the partnership can then be formally registered by applying to the Farm Partnership Registration Office, Dept. of Agriculture, Food and the Marine, Agriculture House, Kildare Street. Dublin 2.



Risks	How to reduce/manage the risk
Lack of trust	Get to know your prospective partner Is he/she trusted by others? Observe if he/she provides truthful and accurate information both to other people and to you Transact business with him/her on a trial basis
Partnership not viable financially	Establish the current profitability of both farms Draw up a business plan for the proposed business including the likely investment required Establish the level of borrowings on both farms
Partner not a competent farmer	Examine Teagasc profit monitor results Visit each other's farms Request farm performance data e.g., from ICBF, Co-op etc.,
Personality clash	Work together on a trial basis
Inability to compromise	Together, discuss and agree all details to be entered into the partnership agreement. This should include: value of assets such as livestock to be introduced to the partnership, profit-sharing arrangements and allocation of work etc. Agree a facilitator and arbitrator to assist and arbitrate in the event of a dispute
Unlimited liability	Use a carefully drafted partnership agreement Select partners with care

② How could I benefit from forming a family registered farm partnership?

Key Question



A family registered farm partnership could enhance the future prospects of your farm's viability into the next generation by providing:

- a path for meaningful involvement of your son/daughter in decision making
- a hands-on way of improving your son/daughter's managerial ability through added responsibility
- a transition arrangement that allows joint management and responsibility before the full transfer of the family farm to the successor.

- greater security for partners, both parents and children
- a means of growing the farm business through access to special benefits such as EU/government supports or tax benefits.

Sources of information

A template farm partnership agreement and application documents are available at:

<http://www.teagasc.ie/collaborativearrangements/>
and <http://agriculture.gov.ie/farmingsectors/newfarmpartnershipregister/>

Farm Partnerships and Other Business Options

Farming company

③ Should I move from being a sole trader to a company?

Company tax is much lower than the personal income tax you will pay as a sole trader. If your business is making substantial profits, you can reduce your tax burden by leaving profits within a company. However, if you draw money out of the business in the form of income or as a dividend, this money is taxed at the higher personal income rates. Assets within a company can therefore accumulate tax-efficiently but these assets will attract tax when withdrawn from the company. It is worthwhile discussing individual situations with an accountant or tax advisor.

Before contemplating transferring the farming business to a company the following should be carefully examined:

- Are you paying substantial tax at the high rate?
- Will your future taxable income as a sole trader increase or decrease?
- Will a significant portion of farm profits be required for living expenses?

- Will you continue farming for at least the next 10 years?
- Do you plan to expand your business and require borrowings to fund such expansion?
- Are all available tax reliefs being utilised?
 - Stock relief - Is stock relief (currently available at 100%), being maximised?
 - Will more capital allowances become available in the next few years?
 - Have you utilised your full pension investment tax allowances?
 - Could family members be paid a wage or an increased wage from the farm?
 - Could a registered farm partnership be formed to reduce tax liability
 - Could income averaging be used to reduce tax liability?

Tips:

- A company can be a partner in a registered farm partnership.
- If possible keep land ownership outside the company.

Identify tax efficient ways of taking money out of the company

Efficient ways	Inefficient ways
Low PAYE wages to directors	High PAYE wages to directors
Pension contributions	Paying dividends
Mileage and subsistence expenses	Taking loans from the company
Sale of livestock and machinery as sole trader to company	

Risks of farming in a company

Risks	How to reduce the risk
Unfavourable future change in tax legislation or EU/government supports for company farming	Plan company expenditure and investments to minimise tax payable in the event of unplanned dissolution of company
Where two or more farms are involved, loss in EU/government supports	Discuss implications with your agricultural adviser/consultant
Future reduction in farming profits	Prior to establishing a company, draw up a business plan
Company viability undermined by transfer of interest in company to family members	Get good accounting and legal advice
Non-compliance with company legislation	Get good accounting and legal advice



Risk

You should never deal with company money as if it were your own personal money, the company is a separate legal person.

Share farming

④ Is share farming for me?

www.revenue.ie describes share farming as: two parties, a landowner and a share partner, who carry on separate farming businesses on the same land without forming a partnership or a company. Each party makes separate contributions to the arrangement, for example, land, machinery, labour and expertise, and takes a share in the produce or gross output. Likewise, each party contributes their own costs of production.

The share farmer and landowner keep their own accounts and calculate their own profits as separate and individual businesses notwithstanding that each business is loosely linked to the other.

The potential benefits

Share farmer	Landowner
Share farmer can operate as a sole trader without forming a company or partnership with the landowner. However, the share farmer could himself be a company or partnership	Can be regarded as a farmer for tax and EU/Government support schemes
Provides access to land without paying rent	Can continue his/her interest in farming without having to retire
Risk is shared	Can share in the fortunes of the farming outcome
Costs & produce are shared	Can reduce work input
Avenue of entry to dairy farming for young trained farmers	Can avoid having to replace mobile machinery

Tips

The basic concept of share farming is the same for all farm enterprises: dairy beef, sheep and tillage.

Monthly reconciliation of receipts and expenses is required to keep track cashflow for both the landowner and the share farmer.

Sources of information

A specimen share farming agreement, and tax briefing is available online by accessing http://www.teagasc.ie/collaborativearrangements/share_farming_dairy/

Teagasc Advisory Office, Moorepark,
Fermoy, Co. Cork Phone 025 42244

Local Teagasc offices

Consultants

Department of Agriculture

Revenue Commissioners



Section 1



The Magic of Project Management

by Tom O'Dwyer



Introduction

A project is a carefully defined piece of work or task which has a start and end point. The job of the project manager is to ensure that the project is completed on time, within budget, and to the expected quality. In this chapter we use a greenfield dairy site development as an example.

- ① What is project management?
- ② Why is scoping a project so important?
- ③ What do I need to consider when planning the project?
- ④ What are the key steps in implementing a project?
- ⑤ What are the benefits of carefully evaluating the project?

The Magic of Project Management

① What is project management?

A project is a piece of work with clearly defined objectives and a specific end-point. The project manager requires a range of skills including leadership, planning and communication.

Project management involves the co-ordination of activities, many of which are being performed by other people. You could think of a project manager as the conductor of an orchestra.

Resources are always limited and any project involves a compromise between time, quality, and cost. Doing the project very quickly will almost certainly involve either greater cost, or a reduction in quality, often both. The greater the amount of time you allow for the project the less is the risk of lower quality or cost overruns.

Effective project management will help to ensure that the multiple activities and tasks are identified, scheduled and completed in the correct order - it can help you anticipate problems, decisions and bottlenecks. Each activity or task within the project will have different time lines; certain tasks will have to be completed before the next task can commence, while other tasks can run in parallel.

Anticipating, and planning for, risks is central to project management. Taking the time to successfully project manage your new enterprise is the best way to reduce the risk of cost or time overruns. Though gradually increasing an existing dairy herd could be regarded as operational management rather than project management, the disciplines and tools of project management can be useful here too.

Figure 1 represents the project management cycle. It consists of four stages: scoping, planning, implementing and evaluating. Each stage is important and must be completed. The diagram identifies that there is a lot of work to be carried out before planning and, ultimately, implementation can even begin. Planning is critical, multi-faceted and requires a great deal of time and skill to do well. Reviewing the progress of the project against pre-planned targets on a regular basis is also essential.



Figure 1.
The project management cycle.

② Why is scoping a project so important?

This is the part of the project where you define exactly what the project involves. It can also be useful to define what is not involved. After careful thought you will have defined the 'scope' which might be to have a parlour, buildings, facilities etc. for 150 cows.

Checklist for the scoping stage



- Precisely define what the project should deliver, when, and at what cost
- What outcome do you require from the project?
- What range of activities has to be completed?
- What is your time-line for the project?
- What activities have to take place first?
- What activities can take place in parallel?
- What is your capital budget for the project?
- To what standard must the outcome be completed?
- Who has to be notified about the project?
- What risks are associated with this project?
- What level of contingency or 'what if' should be built into the project?
- Have you the required skills to manage this project?

An issue to be addressed before starting on the project is an assessment/evaluation of the skills which you can bring to the project. If you do not have the required project management skills, should you consider employing a person that does?

How to

Ensure you get the scope right



- Start early, you can never begin scoping too soon.
- Visit farms which are similar to the one you want to set up and talk to the farmer there – he will almost certainly help you identify pitfalls.
- Take the opportunity to milk in other milking parlours so that you know what you want when it comes to the planning stage.
- Sticking to clearly defined objectives will ensure that the scope of the project isn't extended.

Key performance indicator



The outcome of the scoping process should be a short written document which will help to describe what the successful project will look like. Do not 'move the goal posts' as you go along – unless there is a really compelling reason. Planning (the next stage) must be completed by early/mid summer, to allow construction to be completed before the autumn. Scoping must be completed before this.

Key risk



If you have not defined exactly what you hope to achieve, and when, you are likely to lose time, quality or money, usually all three. Avoid 'scope creep' by sticking to clearly defined objectives

- ③ What do I need to consider when planning the project?

Planning the project



This stage involves prioritising the resources required and deciding on the order in which tasks will be completed. Your project will have a defined, and limited, budget. You will have to decide where it is necessary to invest your money to get the best return rather than on 'nice-to-haves'.

You will be required to make ruthless decisions during the planning stage, and stick with these decisions during the implementation stage.

Options need to be considered under the following headings:

- Stock
- Grazing infrastructure
- Roadways and paddocks
- Soil fertility
- Reseeding
- Water
- Milking parlour, dairy and associated facilities
- Statutory obligations i.e. slurry storage, isolation sheds
- Other facilities i.e. winter housing, calf sheds, handling facilities

How to

Stay within budget



Ask yourself: What do I **need**, rather than what I would **like** to have? What can I afford? Consult the business plan.

Do not be tempted to sneak in additional work that is not expressly itemised in the scope.

Key performance indicator



The outcome of this second stage will be a written document listing your decisions on each of the options listed above. You also need to identify how you will allocate your budget to each of these categories; you must 'ring-fence' a portion of your budget to each category before you start spending.

Take the time to hunt down savings on specific components and set up a tender process for elements of the overall project. Check if contractors have successfully completed similar projects previously. Talk to and visit, other dairy farmers who have undertaken similar projects.

Key Risk



Running out of money

Remember to build in a contingency to all your calculations. At least 10% of the overall budget should be set aside as a contingency fund.

The Magic of Project Management

It is essential at this stage to create a time-line for your project. Make sure that you build milestones into your plan to check progress on the project as it is implemented. An example of a time-line for a dairy farm expansion project is shown in Table 1.

Table 1. Indicative time-lines for establishment of a greenfield dairy unit.

Item	Time/Date	Action
Financial	Apr Year 1	Agree loan facility with bank
	Dec Year 1	Draw down funds
Permissions	Dec Year 1	Apply for herd number (Appendix 1)
	Jun Year 2	Obtain milk supplier number (Appendix 2)
	Jan Year 2	First meeting with engineer
	Feb Year 2	Pre-planning meeting with County Council staff – planning and environment
	Mar Year 2	Submit planning permission (Appendix 3)
	Jun Year 2	Planning permission granted
Stock	Jan Year 2	Plan for stock purchase (number, quality and budget)
	Jul Year 2	View potential stock
	Sep Year 2	Purchase stock
	Jan Year 3	Stock arrive onto farm
ESB	May Year 2	Contact ESB re installation of 3-phase electricity (Appendix 4)
	Sep Year 2	Power to switchboard
Water	May Year 2	Contact County Council re connection to water mains (if no existing connection or not sinking own well) (Appendix 5)
	Nov Year 2	Mains connection provided
Soil fertility	Jan Year 2	Soil sample entire farm
	Mar Year 2	Apply lime, P and K as per recommendations
Reseeding	Feb Year 2	Reseeding plan agreed
	Aug Year 2	Paddocks reseeded
Roadways, paddocks and water	Mar Year 2	Plan for farm roadways, paddocks and water system agreed
	Apr Year 2	Roadways begun
	Sep Year 2	Roadways completed
	Oct Year 2	Paddock fencing begun
	Nov Year 2	Paddock fencing completed
	Apr Year 2	Water system installation begun
	Sep Year 2	Water system installation completed
Site work	Jun Year 2	Farmyard site marked out and work begun
	Jun Year 2	Site works completed
Lagoon, stand-off pad and feed face	Jul Year 2	Construction work begun
	Sep Year 2	Construction work completed
Milking parlour, dairy and associated facilities	Sep Year 2	Construction work begun
	Oct Year 2	Concrete work completed
	Oct Year 2	Steel work begun
	Nov Year 2	Steel work completed
	Dec Year 2	Plant installation begun
	Dec Year 2	Plant installation completed
	Jan Year 3	Milking parlour ready to use
	Apr Year 3	Snags fixed

Checklist



For planning stage

- Begin with the end in mind...develop your project time-line with the date on which the milking parlour becomes operable as your end point.
- Infrastructure development, from planning to being fully operational, ALWAYS takes longer than expected so allow extra time.
- Plan to carry out weather sensitive works, especially site works, during typically good weather months.
- Find potential animals; note that properly checking their health status, and negotiating a deal takes several weeks.

④ What are the key steps in implementing a project?

Implementing the plan



Planning the work is one thing, working the plan is another. This stage involves applying the plan, monitoring progress at identified milestones and resolving problems as they occur. It is likely that you won't be implementing the project on your own. Communication and team work will be the key to success. Ensure decisions are agreed and understood. Listen to suggestions for improvements to the plan. Be prepared to adjust the plan if necessary, provided that the plan can be brought back on track again following the adjustment.

Key risk



Poor quality of work/quantities delivered

All activities that are part of the expansion development must be closely monitored and recorded. This includes loads of stone, loads of concrete, contractor hours, depth of concrete, quality of material from quarries etc. If this is not done cost overruns or inferior quality work may result.

Inadequate monitoring

Watch for any deviations from the plan. The project manager must prepare a monthly update of actual development costs against budget. This requires contractors and suppliers to provide monthly invoices, unless they are delivering to an agreed total cost.

Implementation checklist



- Start site works in spring and construction in summer; plan to finish before the autumn.
- Managing contractors is a full-time job – it leaves you with very little time for other tasks.
- The impact of uncontrollable factors, especially weather, on planned time-lines can be dramatic.
- Be prepared to adjust the plan if necessary but make sure to get back on track following the adjustment.
- Watch out for budget/scope creep. Do not be tempted to sneak in additional work that is not included in the plan/budget.

⑤ What are the benefits of carefully evaluating the project?

The review of the plan will have begun during the previous phase (implementation). At the very end of the project, you will want to see if the project has had the desired effect/impact. Have the objectives which were set at the outset been met? You may also learn some lessons which can be used for similar projects in the future.

Key risks



- Financial viability.
- Buying animals with infectious diseases.
- The overall project can take much longer than anticipated.
- The project manager underestimates the time/personal energy input needed. The project manager must be 'on the job' full time in a greenfield site dairy unit development.
- Project management of the conversion of a greenfield site to a working dairy farm, over a very short time-frame, is very demanding and can lead to significant capital overrun if not managed properly.
- Cash flow management during conversion and first season production is very difficult but critical to the success of any new dairy business.

The Magic of Project Management

Notes

How to

Apply for a herd number

- Obtain and complete Form ER1. This is available from your local District Veterinary Office (DVO) or online at www.agriculture.gov.ie. You will need: personal details (PPSN, date of birth), milk supplier number, proposed stock numbers, details of veterinary surgeon for new herd, and the details of the land on which the proposed new herd will be kept (including maps, folio number and lease if applicable).
- Forms ER1.BD and ER1.1 should be completed if you wish to avail of a direct credit facility from the Department of Agriculture, Food and the Marine (DAFM) and if the new venture involves a partnership or company respectively.
- Once the application is made, a representative of DAFM will visit the proposed site for the new venture. Animal handling facilities have to be available at the time of this inspection.
- Applying for a herd number may take up to a month.

Register as a milk supplier

- Complete a 'Milk Supply Agreement Contract' between you and your milk processor. Establish a new milk account with the milk processor. Your milk processor will allocate you a milk supplier number; you will require this for the completion of the ER1 application form for a herd number.

Apply for planning permission

- The first step in this process is to engage a competent engineer (It would be best if he/she has handled a similar planning application). A pre-planning meeting with both the planning and environmental staff in your local County Council is advisable.
- Time spent in gathering information and completion of the planning permission application will pay off by increasing the likelihood that permission will be granted without further problems.

Apply for an ESB connection

Step 1: Get an Ordnance Survey map and a site plan.

Step 2: Download application from www.esb.ie and submit to ESB Network Services Bureau, PO Box 29, Garrycastle, Athlone, Co. Westmeath.

Step 3: Receive an acknowledgement.

Step 4: Receive a quotation and connection agreement.

Step 5: Return payment.

Step 6: Going live (1) register with an electricity supplier of your choice (2) your electrical contractor must submit the ETCl wiring certificate.

Connection takes place 12 weeks from payment or consent, whichever is the latest.

See the ESB Networks website www.esb.ie for further details.

How to

Apply for a water connection

- Obtain and complete the appropriate form from your local County Council. A connection charge will apply. Once payment is made, the connection to the mains can proceed. This could take 16 to 20 weeks.