

Kevin Twomey

Where to start a sustainable dairy farm on a grass based system

A Republic of Ireland Award

Firstly I would like to my family for their support and help. I would also like to thank my sponsors the Irish Farmers Journal, the IFA and FBD Trust.

Introduction

I am married to Margaret and we have 3 wonderful children, Emma 7, Eoin 5 and Niamh 2. I am the youngest in a family of six with my two elder brothers farming with my parents. As there was no requirement for a third son in the business I qualified as a Farm Manager in 1993 through the Farm Apprenticeship Scheme. On completion of my training a dry stock farm came up for sale in Ballyhooly Co. Cork. With the help of my family the farm was purchased in 1993. The following year the farm was converted to dairy and I started dairy farming with 40 cows in 1994. Ireland at that time opted to tie milk quota with land which made expansion extremely difficult. I grew the business through leasing land and quota, purchasing the quota as the leases expired. This process enabled us to develop the business to owner/operate a farm of over 200 acres and milk 200 cows plus followers on a low cost high profit grass based system. We plan to increase this further as soon as quota allows.

As the end of EU milk quotas and 2015 approaches, Ireland will enter uncharted waters because for the first time in 32 years there will be an opportunity to enter dairy farming unrestricted by quota limitations. The average herd size in Ireland is 49 cows. I believe Ireland has fantastic natural resources, of a temperate climate with reasonable rainfall and the ability to grow 15-17 tonnes of grazed grass dry matter per hectare. This is our competitive moat. With milk quotas going there will opportunities to set up “Greenfield Sites” that is new dairy farms of reasonable scale of 200 – 400 cow units. However these ‘Greenfield’ sites will need a lot of financial investment, as land, labour and livestock are expensive. I have used my scholarship to investigate and compare the physical limitations and financial challenges to setting up “Greenfield” sites. Grass Based Dairy Systems have the lowest cost of milk production. Low cost means less purchased inputs, less machinery and fewer complications. It is a simple system easily replicated and low cost means higher farm profit. It also means much less exposure to farm input inflation meaning much more control is held inside the farm gate. Rising grain, fertiliser and fuel prices have less affect on grass based systems. All parts of Ireland can grow this source of cheap feed.

On my travels I have compared setting up Greenfield dairy units in Ireland to Mid America, United Kingdom and New Zealand. These are my opinions that I have developed on my travels.

The Study:

My report covers 5 key areas. These are

1. Milk Markets
2. Land availability, suitability and cost

3. Cow genetics
4. Labour availability
5. Return on equity

Ireland

Ireland produces 4% of the total EU milk production at just over 5 billion litres. Our domestic market consumes about 15% of this. Ireland exports over 60% of its produce in the form of butter and has failed to develop new product mixes since the easy option was EU intervention storage for surpluses in the past. This is now a huge weakness in that we are fully exposed to the volatility of the world market as we move towards a less restrictive world market. Irish Co-ops and Plc's sell over 60% of their products through the Irish Dairy Board (IDB). The IDB is basically a commodity trader and does not have the wherewithal to attract and execute niche product sales and innovation. In the very recent past Irish processors often competed with the Dairy Board undermining each other on commodity trading. The Irish Dairy Board is solely focussed on marketing and each of the main co-ops is represented on the board. Ireland is and will be for a long time a commodity exporter.

Land availability and 'It's present' cost to purchase in Ireland will be a limiting factor in setting up 'Greenfield' dairy farms. There are three key issues at play here. Firstly there are strong family ties to particular parcels of land, many farmers are farming the same land as their forefathers, and thus leading to an illiquid land market with less than 2% of land being traded annually. The second issue is that many farms are relatively small in scale with the average holding of 28 hectares. However this does not tell the full story as most of these holdings are fragmented meaning the average milking platform is even smaller. The third issue is land price; following on the tail of Celtic Tiger land prices in Ireland do not reflect its earning capacity with land prices in excess of €50,000/hectare. Dairy farming on a newly purchased farm as a standalone operation on a Greenfield site is impossible to be self-financing. There are however other ways that are possible that is through long-term leasing/partnerships and converting owned dry stock/arable land. There are currently only a handful of dairy farmers operating on a long term leases but they are proving very successful. Therefore the most likely ways to become a new dairy farmer or even expand onto a second unit is through converting an owned dry stock farm or long term leasing/partnership.

Ireland does not have a history of long term leasing; traditionally land is let annually or more recently in through the EU Farm Retirement schemes of 5-7 years leases. However the Irish Farmers Association last year successfully negotiated increased tax incentives for farmers to let their land for 10-15 years. This should help the availability of land for lease into the future.

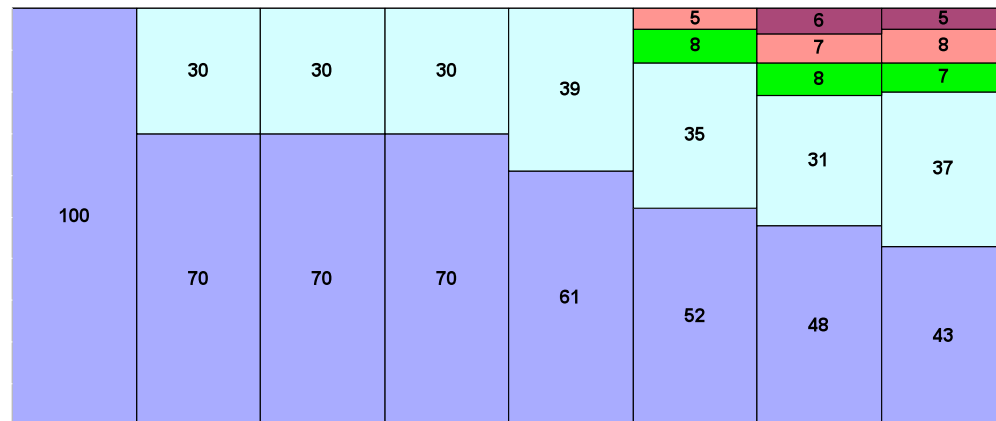
Cow genetics

In setting up a new Dairy Farm the cow genetics must match the system to be operated on the farm which in this case is compact spring calving.

Over the last 6 to 7 years a new cow and bull index has been developed called the Economic Breeding Index (EBI). This index has continually developed to incorporate the balance of milk production, fertility and the other traits. A high EBI herd is desirable when starting a new farm so using this index is essential when purchasing the core herd. One disadvantage of setting up a large farm in Ireland is the availability of the high EBI stock. Nationally Ireland is only breeding a 21% replacement rate

and of this only 25% of these are bred from AI sires, the remainder being by stock bulls. Thus the quantities of surplus AI bred heifers and cows are small. It is very difficult to put together a new herd of 400 high EBI cows.

EBI Index 2000 2001 2002 2003 2004 2005 2006 2007



Production
 Fertility
 Calving
 Beef
 Health

One the main risks of mixing different herds together is that of disease. I will deal with the five most prevalent.

Disease	Precaution	Cure
Prevention		
1. Tuberculosis	30-day pre/post tests	Slaughter
Annual tests. Keep badgers away from water tanks and feed.		
2. BVD	Blood test new cows	Vaccinate or cull PI
Scan bloods annually for PI. Vaccinate.		
3. IBR	Blood test new cows	Vaccinate or cull on
blood test	Screen milk and or blood and cull poor performers.	Vaccinate.
4. Johnnies Diseases	Blood test new cows	Cull positive animals
immediately	Screen blood and feed only mothers colostrums to its calf.	
5. Salmonella	Blood test cows and dead calves	vaccinate to protect
pregnancy	Monitor cow/calf. Vaccinate.	

It would be wise to protect a new herd for these diseases especially if there are more than two herds of cows being mixed to create a much bigger herd.

Labour and Support

Historically Ireland has produced many top international Farm Managers be it in Dairy, Livestock or indeed Bloodstock. Many of these managers were the pupils of the Farm Apprenticeship Board (FAB), which was a 3-year course in practical and theory farm management. FAB used to train up nearly 100 new farm managers every year. However as the Celtic Tiger began to roar FAB was amalgamated into Teagasc where it lost its identity and effective training. It is now the shortage of numerous highly skilled staff is beginning to show. There is however reasonably quantities of good staff available although many are not trained to manage over 200 cow units. It is the cost of staff that is the main issue and Ireland needs to increase cow numbers to 150 cows per labour unit to spread this cost.

In terms of research and advisory Ireland is well equipped. Ireland has the world leading dairy research centre lead by Pat Dillion and his team in Teagasc, Moorepark. Moorepark evaluates independent research based on profit and sustainability. Moorepark has great innovation and works hard to make the research relevant to farmers. Ireland also has a national independent advisory in Teagasc, advisory led by Matt Ryan. This is currently being refocused in getting advisors to specialise in Dairy only work thus leaving other advisors to focus on administration and other enterprises. There are also many private consultants available to enable farmers to grow their business.

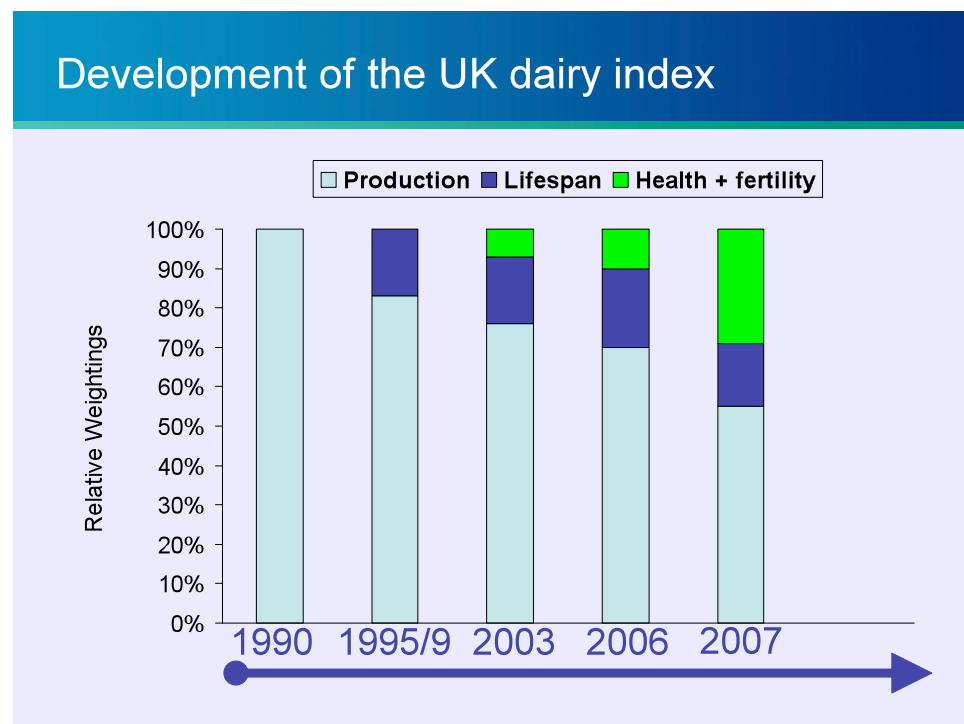
United Kingdom

The UK is the ninth largest milk producer in the world at 140 billion litres. UK farmers have received a very poor milk price for the last decade so much so that almost 7% of dairy farmers are exiting milk production annually. The whole world can now see that a leading dairy country with the best domestic market will decline due to ruthless trading of processors and strangling power of the Supermarket chains supported by a government that has forgotten the most important fundamental being as self sufficient as possible in food production. Dairy cow numbers have declined by 20% in ten years and farmers by over 50%. In the late summer of 2007 the need of fresh liquid milk supplies hit home as the retailers scrambled to secure supplies even resorting to importing liquid milk from Europe, which still continues. However farmer confidence has being severely effected and there is no reversal of this decline in milk production in sight. Liquid milk accounts for 60% of milk utilised by UK dairies along with 30% in cheese. The UK is less than 80% self sufficient.

The UK has a temperate climate with reasonable rainfall particularly in Scotland, Wales and the western half on England. There is a great deal of land in the UK very capable of growing 12- 15t/ha.year of grass which is ideally suited to grass based systems. On average farm size in the UK is 115 acres giving reasonable scale. The land market price has increased by 40% since the surge in commodity prices took place, however arable land generally trades a premium of £1,000/ac. bare land sell for about £4-5000/acre. There are opportunities to convert arable and drystock farms to new dairy farms this is possible through land purchase, Farm Business Tenancy (Long term leasing) or contract farming. Farm Business Tenancy of 10 to 20 years plus are common in certain parts of the UK and tend to have realistic aspirations for both landlord and tenant.

Cow genetics in the UK are different to that of Ireland. The PLI index is used. Typically the UK has more confinement type systems in which herds are bred for higher yielding cows. Consequently herds have very poor fertility with cows being unsuitable for grazing systems. The vast majority of cows would struggle to last in block spring calving grass based systems.

The health status of herds in the UK is a little inferior to Ireland, principally because of feeding for and breeding for higher yields of milk which puts enormous stress on both the cow's digestive and reproductive organs. The main diseases in the UK are very similar to Ireland. The average herd in the UK is 114 cows so in theory it is easier to source a new 400-cow herd than in Ireland. However it is extremely difficult to source the right genetics of compact spring calving cows. Indeed many UK farmers have imported dairy stock from Ireland over the last few years. Only recently the trait of health and fertility has been added to the PLI index.



With a population of nearly 60 million, labour is reasonable available in the UK, in particular milkers. However good grass based dairy managers are not. There is little or no training programmes for staff available. Grassland management is a skill not being taught well or even developed at Agriculture colleges. Some of the best farmers are investing into their own staff skills and searching for potential staff in some of the colleges. Good grassland research is almost non-existence. There is no leadership or independent research with much of the questionable research being commercial industry led. "You get what you pay for". Advisory is equally fragmented with the common measure being margin over feed a term that is meaning less. Surely profit per Litre or Hectare is a true measure. The lack of government support and farmers working as individuals has set British dairy farming back over a decade.

USA

On my travels to the United States I concentrated my study in the state of Missouri. The United States is a vast country and is the largest milk producer in the world at 80 billion litres, which despite all the odds has turned on tap on milk production despite much higher energy and feed costs in 2007/2008. However within the US there are vast deficits and surpluses. The southeast of the States is in milk production decline against the background of a population migration to the warm sunny climate of the southeast. This certainly creates opportunity to tap into this market as the further east you go the more competitive the market place becomes. Milk prices are currently at \$18/cwt with production costs on confinement systems at \$17/cwt plus. Dairy Farmers of America (DFA) have their headquarters in Missouri. They are a dairy marketing co-operative with 34% of US supply covering over 18,000 dairy farmers through 48 States. DFA are industry leaders selling 80% of their supply as fluid milk and are supportive of increased dairy farmer expansion.

Over the past number of years there has been a growing native interest in grass-based systems in Missouri this has occurred with the help of Missouri University in Colombia. This interest has increased in the last few years with a number of different New Zealand farming companies setting up new grass farms. Most of this interest has occurred in the south west of Missouri State which oddly enough has less predictable rainfall and slightly poor soil types than the east of the state. Land is freely available at \$2,000 - \$2,500/acre and is on average appreciating on a 50-year average of about 5 – 7 %. Four hundred to five hundred acre blocks can be sourced with the help of local knowledge. The climate as one would expect is continental with harsh cold winters and hot dry summers. As with continental climates extremes can occur more often such as ice storms, droughts and tornados as well the risk of late springs/early winters. Rainfall is pretty reasonable at 38 inches but can be sporadic and very heavy falls can distort the average. Joe Horner of Missouri University predicts 5 tonnes of grazed grass as being a realistic repeatable average. The New Zealand's are hoping to harvest between 8 – 10 ton of grazed grass.

It is extremely difficult to source suitable genetics in the US. Nearly all US cows have being bred for confinement systems of high milk output on high inputs. Many of the grass based farms have purchased Jersey cross cows in the hope of getting smaller cows with hybrid vigour to improve fertility. When purchasing a new herd there are many issues. Firstly one could not select within the herd so the purchaser ends up buying culls as well as poor performing cows. Secondly almost for certain the cows may not have seen or grazed grass before thus leading to a massive transition period of 1 to 2 years. Thirdly it will take at lease one cross of suitable genetics to stabilise the herd. And finally the disease level within US cows is very high. Many herds do not have good records of their cows, health status, and vaccination programmes and drugs records. Buy a new herd of cows comes with very high risks with some farmers budgeting to purchase 40% above requirements in order to get a reasonable herd.



In the state of Missouri, basic milkers can be employed easily but require training to new grass based systems. There are no Dairy managers available to run these grass farms, which means key staff, must be imported. With the help of the University of Colombia in Missouri, over time some more people will become educated in grassland management. This University is also carrying out some research in grass based dairy farming but this is still in its infancy and on a small scale covering a massive state. From the University advice is also given through discussion groups and open days. The staffs are doing a good job but there are many issues yet to be tackled and ongoing issues such as what is the best grass species to be used yet to be bedded down. This labour/support is probably the weakest sector in setting up a Greenfield site in Missouri.

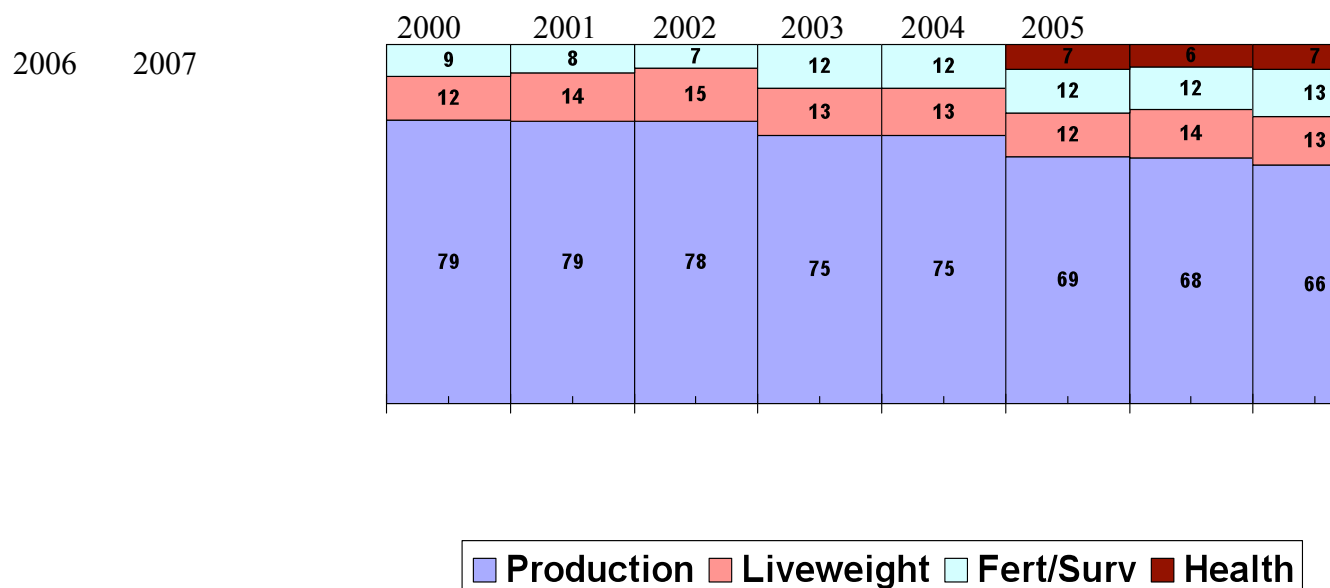
New Zealand

New Zealand is the eight biggest producer of milk in the world with over 16 billion litres. Having a population of over 4.2 million people means New Zealand exports over 95% of its produce and is a major player on the world market. Fonterra is the biggest processor with over 95% of the milk pool. It a Co-op based and is the biggest trader (over 33%) on the world market. To start supplying milk to Fonterra one must first buy shares, presently one share cost \$7.01 and gives you the right to supply 1kg milk solids per annum. Milk price in New Zealand is almost totally dependant on

world commodity prices as consumer's products only added about 5% to Fonterra payout last season.

The land market in New Zealand is very liquid with up to 10% of land being traded annually. It would be fair to say that historically farm incomes have been the key driver behind farmland values with farmers the predominant buyers of land. More recently high commodity prices and demand from lifestyle buyers has weakened this influences further. New Zealand land prices have increased again, fuelled by rapid dairy expansion. The average price of dairy land has more than doubled in the last five years. The major advantage to land access in New Zealand is the liquidity of the market. There is always a selection of farms on the market or would be sold at a price. New Zealand farmers have made fantastic progress in the business helped by a banking system where land assets are revalued annually thus increasing the leveraging ability of the farmer. A lot of New Zealand farmers have progress almost totally on capital appreciation, where they re-gear the farm annually; as the asset value increases yearly the farm can be re-gearred using the surplus to fund expansion of the dairy business ensuring they have sufficient cash flow to repay either interest only or interest plus capital loans. This however has its risks if and when a short period of flat or negative growth in asset value happens some dairy farmers are over exposed and risk going out of business. Farmers and banks have strong relationship due to farmers producing good budgets and performing to reach the targets. The following gearing is generally available 65% land building, 80% Fonterra Shares and 60% Dairy Stock. Most of the dairy expansion is happening in the South Island with dry stock farms being converted and or dry land being irrigated.

Of the four countries in this comparison New Zealand is the best for both genetics and availability of cows. Over many decades the New Zealand cows have evolved about spring calving grass based milk production. The index currently being used is called Breeding worth (BW). The breakdown of the index is



Being seasonal calving means herd fertility has to be excellent to achieve the efficiencies of profitable milk production with high AI usage leads to creating surplus stock which has established the dairy industry grow from strength to strength. There are many companies/agents/Dairy farmers who sell part or all their herds for either strategic or financial reasons. Thus buy an entire herd of 400 cows with good BW is quite achievable.

The disease statuses of herds are very good so the movement or mixing of herds is now an issue. New Zealand leads the way in terms of experience in grass dairy farming. Having developed dramatically in the last few decades, dairy farming has been great for New Zealand and since deregulation it has proven to be a highly respected profession and often attracts non-farming people into its industry. Most dairy farmers will tell you labour is hard to find. Quality labour can be but usually good farmers get good managers/ sharemilkers. Retraining of farm staff are ways of increasing productivity without increasing payroll. Research is vital to any industry and New Zealand has benefited enormously from this in dairying. I feel present research should refocus on what is sustainable for the long-term and leaves a good profit for the farmer. Rather than what is good for "New Zealand Internationally"? There are a lot of advisors available in New Zealand with Dairynz being the main route through discussion groups. However there has been a notable fall off in attendances over the last few years. Overall there is an excellent network of support available in New Zealand.

Return on Equity

Key Assumptions

Purchase a 400 acre farm and 500 cows. The farm will be converted to dairy with all costs accounted for. Land costs for Ireland, UK, US and New Zealand at 20000, 7000, 1675 and 5000 euros per acre respectively. Cows costs are 1600, 1600, 1500 and 1200 euros plus a 20% charge for US cows, for herd wastage. Milk production per cow is 400, 380, 350 and 350 respectively. It is taken that 70% finance is available on the entire investment although in practice it may not always be achievable. Costs of production are taken as % of milk income as it seems to be the fairest way to evaluate.

Conversion rates.

1€ - £ .79

1€ - \$1.49

1€ - NZ \$2.14

	Ireland New Zealand	UK	
US			
Land	8000000	2800000	670000
Conversion	750000	600000	430000
Cows	800000	800000	900000
Shares			
Total	9550000	4200000	2000000

Capital

Finance

Bank 70%	6685000	2940000	1400000
Investor30%	2865000	1260000	600000
Total	9550000	4200000	2000000

Output

Production Kg milk solids	200000	190000	175000
Milk price € kg ms	4 800000	4.5 855000	4 700000
Costs %	60% 480000	63% 538650	75% 525000
Interest %	5.5 368000	6.25 187500	6% 84000
Total Costs	848000	726150	609000
Profit	-48000	128850	91000
ROC %	-0.50	3.68	4.5
ROE %	-1.67	10.2	2

Conclusions and Recommendations:

Milk markets

- + We as Irish farmers have failed to recognise where the market for our produce is. We have failed to progress the rationalisation of our processing. Local and national politics have not served us well in delivering a unified approach to both the processing and the selling of our products. Remember our products scarcely vary from one Co-op/Plc to the next.
- + We don't need a review; we need a Paradigm Shift "start with the end in mind". We need to appoint a Dairy Ireland CEO charged with the responsibility to deliver Ireland as a world leading low cost processor of commodity products shifting towards ingredient markets. The Dairy Ireland CEO will be responsible for the selling of these products and will seek out opportunities to change our product mix away from butter.
- + I recommend that the Dairy Industry should seek out suitable partners in joint venture arrangements. These joint ventures would bring together our quality milk with added technologies and marketing ability from proven companies to provide growth to both current and innovative new products.
- + Ireland needs a fast lifting of EU milk quota to develop our dairy business.

Land availability

- + In today current financial climate a stand alone "Greenfield" site on a newly purchased farm will not cover itself on investment terms. Therefore further changes to our taxation system are required to facility both partnerships and the formation of

company farms. There is a need for greater flexibility in the setting up of long-term leasing. As a win win for both owner and operator.

- + New Dairy farms converted from arable or dry stock either by their owner or long-term lease will be successful the model if compact calving to grass is implemented and managed effectively. Ireland needs clear models of different forms of equity partnerships, which match our farming needs. Ben Roche in Teagasc has made great progress in this area. Extra resources are required to define the different paths Ireland needs to develop, paths that will lead to sustainable growth.
- + The banking sector in Ireland should look to the New Zealand model of financing stock and farm goods without the need of land ownership.
- + Teagasc should lead the way by setting up regional 'Greenfield' sites to demonstrate what investment is required, as well as management, scale and efficiencies of operations.

Cow genetics

- + Ireland needs to utilise the best grassland cow genetics available worldwide and this should be in conjunction with the Gene Ireland programme. We need to fully embrace genomic selection, which has the ability to fast track our genetic gain. Genetic gain is compounding so a small increase in additional gain has a dramatic effect over time.
- + The health status of the national herd needs dramatic improvement and has dipped hugely with the importation of diseases such as IBR, BDV and Joneses. Cow performance and survivability has suffered greatly. Herd health is the biggest hidden cost we have and to ignore it will limit our ability to expand our dairy herd. A centralised milk-testing centre would enable Ireland to fast track an eradication programme. This would give us the ability to establish a database through screening of milk samples and implement/review an eradication process.
- + Herd expansion is limited by the lack of AI replacements being bred. There is a need for the Dairy industry to have a more robust breeding policy where milk recording and AI usage is not sold as a cost to farmers but incorporated into milk price.

Labour availability

- + We have many excellent grassland farmers in Ireland. However the lack of quality new entrants into dairy is of real concern. Educational issues are being addressed, but there is a need for additional training on the key important issue, that is measurement. Progress is only got through measurement: Measurement of grass, cow fertility, feed and financial budgeting. This will be the crux of Ireland future farmers. Focus on increasing the % of grazed grass in the cow's diet, as there is a direct correlation with the % of grazed grass and profit.
- + A vibrant profitable dairy industry will attract young people; we need a training programme that will teach them the business skills as well as the basics of matching cow demand with grass growth.

Return on equity on a leased farm in Ireland

- + This is a summary of 250-cow operation on 100 hectares of leased land at a rental cost of 500 euros/ha.

- + The budget includes all set-up costs including the cows of a newly converted farm. The table has two different levels of profit performance 10 cent per litre and 15 cents per litre.
- + 50% leveraging finances it and full labour costs are included.
- + Ireland's growth in dairying is severely limited by EU milk quota this investment only adds up when limits on production are lifted.

	Profit 10 c/l	Return %	Profit 15 c/l	Return %
Year 1	100000	5	150000	9
2	120000	7	180000	12
4	135000	8	202500	14
9	145000	9	217500	15

+ The UK has great potential for grass based production but has no effective national policy or leadership. Commercial company's interests rather than farmer profitability are leading farmers.

+ The state of Missouri is indeed very exciting, set-up costs are cheap and its potential is unlimited from a land viewpoint. However grass based systems need more time to prove it's resilient on a continental climate. The health status on the national herd is poor and their adjustment to a grazing environment will take time.

+ The heat in milk commodity markets is totally reflected in the New Zealand land market. To start dairy farming in the current climate is high risk and would require above top 10 % performance. But who is too say the milk markets will not move up again.

The following table is my summary of a scorecard of purchasing a start up dairy farm. I stress that these are my scores and the weighting on each category will vary along with personal preferences. It should be noted that that long term leasing in Ireland is very attractive once quota restriction is removed.

		Ireland	US	New Zealand	UK
Milk Markets (10)		3	7	3	
Land (10)	Cost (5)	1	5	1	3
	Suitability (5)	5	1	4	4
		5	6	5	
Cow Genetics (10)		6	2	9	
Farm labour/support (10)		8	3	8	
Return on Equity (10)		1	9	2	

Total

24

27

27

“Attitude determines you Altitude”.

Finally if one is ambitious success will follow wherever one farms.

Kevin Twomey
Renny Farm
Ballyhooly
Co.Cork

twomeykm@gmail.com