Teagasc National Beef Conference 2011

9.00 -9.45 **Registration, Tea/Coffee**

9.45 - 10.00 **Conference Opening –**
Minister for Agriculture, Marine and Food

10.00 – 11.35 **Session 1 - Future outlook for Irish Beef Production**
Chairperson: Professor Gerry Boyle, Director of Teagasc

10.00 **CAP – Its Contribution to Profitable Beef Production**
Dr Frank O'Mara, Director of Research, Teagasc
Dr Tom Kelly, Director of Knowledge Transfer, Teagasc

10.15 **Potential for Increased Profitability on Irish Cattle Farms**
Lessons from Teagasc / Irish Farmers Journal BETTER Beef Programme - Aidan Murray, Teagasc Beef Specialist

10.30 **Teagasc Beef Road map and Targets for Derrypatrick Herd**
Dr Paul Crosson/Dr Mark McGee Teagasc Grange

10.45 **Panel Discussion**
Aidan O'Driscoll, DAMF
John Bryan, President, IFA
Cormac Healy, Meat Industry Ireland
Matt Dempsey, Editor IFJ

11.00 **Questions & Discussion**

11.35 – 12.55 **Session 2: Getting the Most from Grazed Grass**
Chairman: Justin McCarthy, Beef Editor, Irish Farmers Journal

11.40 **Achievements to Date and Future Targets from Grazed Grass**
Paul Kehoe, Wexford beef farmer

11.55 **Potential of Grass for Production & Cost Savings**
Dr Michael O'Donovan/Dr Edward O'Riordan
Teagasc Animal and Grassland Production Department

12.10 **Short and Medium Term Steps at Farm Level to Exploit Potential from Grazed Grass**
Pearse Kelly, Teagasc Beef Specialist

12.25 **Questions & Discussion**

1.00 – 2.25 **Lunch**

2.25 – 3.20 **Session 3: Herd Health for Maximum Performance & Profitability**
Chairman: Derek Deane, Suckler Farmer, Carlow

2.30 **Implications & Cost of BVD to National Beef Herd**
David Graham, Animal Health Ireland

2.45 **Drawing up a Herd Health Plan for BVD & IBR**
Riona Sayers, CEO, IML Ltd.

3.00 **Questions & Discussion**

3.25 – 4.00 **Session 4: Breeding Efficiency & Breed Improvement in Beef Herd**
Chairman: Michael Doran, Chairman Teagasc Beef Stakeholder Group & IFA Livestock Committee

3.25 **Making Greatest Use of Beef Breeding Index – Sire & Dam**
Andrew Cromie, ICBF

3.40 **Achieving 365 Day Calving Interval & 12 Week Calving Spread in Suckler Herds – BETTER Beef Farm Experience**
Adam Woods, Teagasc/Farmers Journal BETTER Beef Programme

3.55 **Questions & discussion**

4.15 **Session 5: Live Exhibit of AI Progeny to Demonstrate Potential of AI in the Beef Herd**
Exhibit of AI progeny (with dams) presented by NCBC and Dovea

Facilitator – Terry Carroll, Teagasc Business and Technology Adviser

- AI Potential – terminal sires
- weanling export
- breeding suckler replacements

Rose Goulding, NCBC
Ger Ryan, Dovea

4.45 **Closing Address**
Bernard Smyth, Teagasc Drystock Programme Manager

Achieving Profitability from Beef at Farm Level

Profitability across the entire production chain will be a key requirement to ensure the Food Harvest 2020 target of a 20% increase in output value for the beef sector is achieved.

We have access to the best beef markets in the world and beef production worldwide is struggling to meet demand – this is positive for future outlook. At farm level efficient producers must be making viable profit levels from the market place but this is not the case in recent years. The safety net of direct payments appears to be under threat, which puts extra pressure on the market place to deliver better returns for meeting the exacting specifications for the EU's premium markets.

Within the farm gate there is also huge scope to increase profitability through the application of the best technology in grassland, breeding efficiency and breed improvement. A new proactive approach is also needed in the animal health area if we are to realise the full profit potential of improvements in grassland management and animal breeding.

The National Beef Conference aims to address the key issues and provide farmer experience and advisory and research guidance on how best to realise the full profit potential of efficient beef production making maximum use of grazed grass. Beef production during the indoor housing period presents a major profitability challenge at farm level, but must be addressed if a year round supply of beef is necessary to maintain access to premium markets. New arrangements between producers / processors / retailers will be necessary to guarantee year round Irish supplies at profitable levels but that discussion is for another day.

Bernard Smyth,
Programme Manager – Drystock,
Teagasc

TABLE OF CONTENTS

The Reform of CAP – Issues for Beef Producers

Dr Tom Kelly and Dr Frank O'Mara, Teagasc Oak Park

Summary

- Cattle farmers' incomes are hugely dependent on direct payments. On average they make up more than 100% of the Family Farm Income in recent years.
- The EU Commission have acknowledged that if the CAP is to survive it has to have a rationale that is acceptable to its citizens. This must be wider than income support, food security, quality, environmental and social benefits etc.
- Cattle producers must look at the amount of these payments that are being retained as farm income. They are income support payments and not lifestyle supports. Individuals must decide how these payments are used. Improved breeding, management and grass utilisation are key.
- While historically the basis of these payments was coupled, they are now decoupled and provide opportunities outside conventional cattle production.
- Ireland is well positioned to grow the value and volume of its cattle industry with more carbon efficient grass based production systems.
- The debate on CAP 2013 to 2020 is ongoing. It is unlikely that the major revisions will take effect before 2015.

Introduction

The current EU budget period finishes at the end of 2013. The CAP reform will be agreed next year or at the very latest during 2013. Period of implementation of the agreed reforms may be into 2014/15. If there is a radical reform then the process may take even longer. There has been a consultation phase over the last 2 years, this has raised issues which are likely to shape the reformed CAP.

The reform of CAP has been ongoing and necessary due to changes in EU policy and now in particular with a larger EU membership and new issues of climate change, limited fuel and world demand for food. We have seen the change from price supports to headage and decoupled payments with built in cross compliance and channelling of funds toward targeted rural development. This reform of CAP is part of the larger EU budget review, given the size of agriculture in the EU budget at circa 40%.

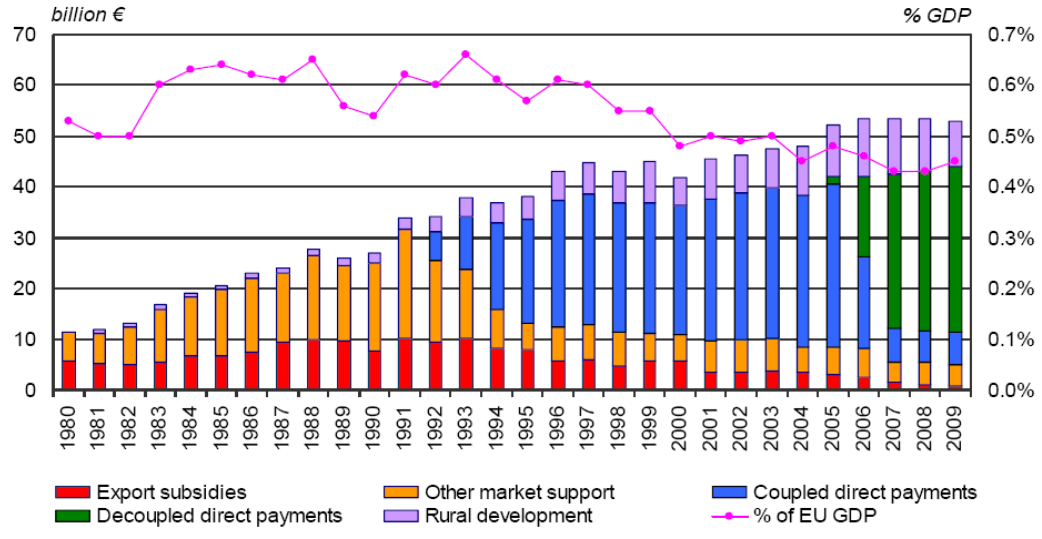
The European Commission are saying that they will support a new, reformed CAP, which supports the more efficient production of a wide variety of quality food products provided that they are in demand and that in their production benefits of social and environmental public goods are evident.

CAP Expenditure has changed significantly with each Reform

Graph 1 illustrates the evolution in nominal CAP expenditure from 1980 to 2009. It also shows that CAP expenditure relative to EU GDP has declined to close to 0.45% in 2009. The change in the nature of CAP expenditure is also apparent. Earlier reforms reduced the importance of market support and export subsidies and led to increased expenditure on coupled direct payments. Recent reforms have seen decoupled income supports increase in importance together with expenditure on rural development.

While the overall expenditure on CAP appears to have increased dramatically in nominal terms, this does not reflect the discounted value of money or the expansion of the EU since 1980: 1981 (Greece); 1987 (Spain and Portugal); 1995 (Austria, Sweden, Finland); 2004 (Latvia, Lithuania, Estonia, Poland, Czech Rep., Slovakia, Hungary, Slovenia, Malta, Cyprus) and in 2007 (Romania and Bulgaria).

Graph 1 The path of CAP expenditure (1980 – 2009, billion current €)



Source: European Commission, DG AGRI

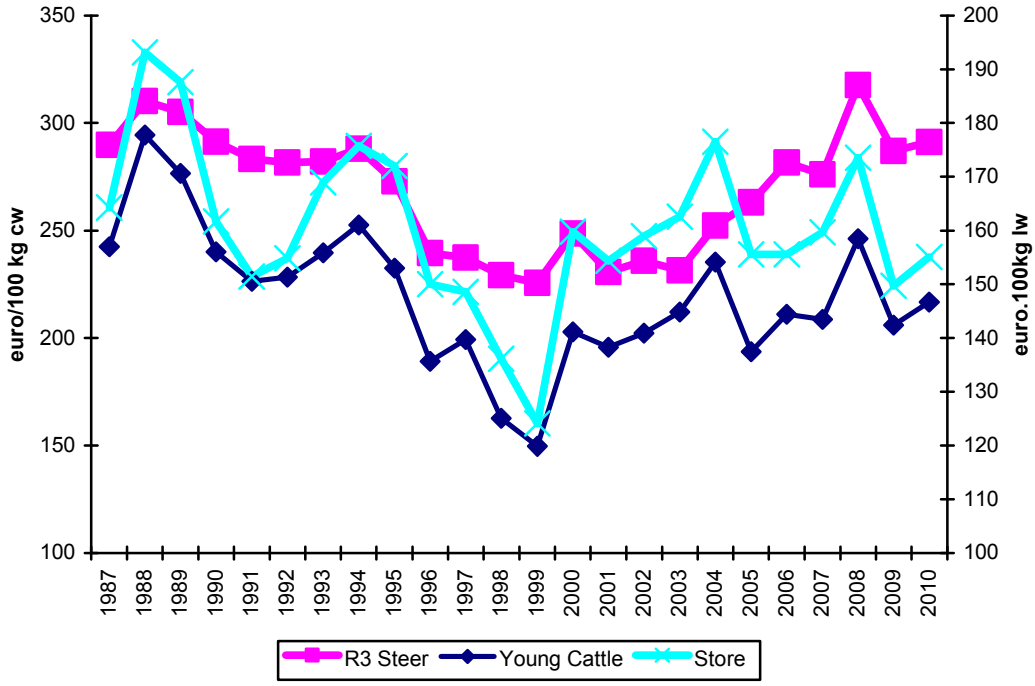
Importance of the current CAP to beef production

The importance of direct payments to beef farmers is best looked at in the longer term. Prior to 1992, the major direct payments were the disadvantaged areas payments. These were equivalent to 8% of the value of farm output in 1992. After the 1992 CAP reforms and reduction in intervention prices coupled premium and area aid systems were introduced to the beef and cereal and oilseed CAP commodity market organisations. The 1992 reforms sought to make the CAP more market orientated and aimed at preventing the accumulation of huge intervention stocks of beef and other agricultural commodities. The 1992 reforms also allowed the EU and the wider international community to conclude the Uruguay Round of Multilateral Trade Negotiations in 1993 that, for the first time, introduced restrictions on domestic agricultural policy and the barriers to trade in agricultural and food commodities. European dairy farmers continued to be supported by market intervention arrangements after the 1992 reforms. The Agenda 2000 CAP reform agreement in 1999 led to some reduction in market support of dairy production.

The 2003 CAP reform (Fischler) involved the decoupling of CAP direct payments from agricultural production. Ireland opted for full decoupling of payments and the use of the historic model, with the reference years of 2000, 2001 and 2002 used to establish the individual farmer single payment system (SPS) per hectare entitlements. The 2003 CAP reform introduced the idea of **"freedom to farm"** to the CAP, in allowing individual farmers to choose the system of farming that best suited their land, labour and capital endowment. Receipt of decoupled direct income support payments is conditional on the satisfaction of cross compliance requirements which set standards for environmental and animal welfare. Despite fears of major shifts in production and land abandonment, up to 2009 the vast majority of farmers continued to farm actively with little or only small changes in practices.

The value of direct payments to farmers grew from an average of €2,000 in 1990 to over €16,400 in 2006. Most farmers still look on these payments as price compensation rather than income support, so the payments are treated like any other farm output e.g. sale of produce or stock. Since decoupling there has been relatively steady increase in nominal finished cattle prices with more volatility in weanling and store prices. Graph 2.

Graph 2. Irish Cattle Prices 1987-2010



Source: CSO. DG Agri and Eurostat [cw = carcass, lw = live weight]

To look closely at what has happened it is useful to use the National Farm Survey data 1990-2009 and see the growth in the proportion of farm gross output made up of direct payments (Table 1). This data shows the increased nominal direct payments and the increased proportion of output made up of direct payments move from market support to headage up to the 2000 reform and the relatively stable proportion of output since payments were decoupled.

Table 1. Direct payments (DP) as a proportion of Gross Output and Family Farm Income FFI extracts from (NFS)

	Cattle Rearing			Cattle Other			All Farmers		
	DP €	% of G.O.	% of FFI	DP €	% G.O.	% of FFI	DP €	% G.O.	% of FFI
1990	1,537	16	50	-	-		2,209	8	26
1995	4,427	39	90	5,015	30	84	5,285	16	47
2000	9,202	48	129	9,610	41	136	9,431	25	74
2006	12,347	49	149	15,237	45	134	16,346	33	97
2009	13,396	52	204	15,437	47	166	17,109	35	143

The National Farm Survey data shows that since 2000 direct payment to cattle rearing and cattle other farmers have made up over 100% of family farm income (FFI) and that the share in 2009 was 204% of average family farm income on cattle rearing farms. The contribution of direct payments in output value and income in NFS survey average farm data is also reflected in the average performance of a

sample of more efficient beef farms (e-Profit Monitor farms) (Table 2). The contribution of direct payments to gross output is lower at about 40% on average, compared to 45 to 50% from NFS data for similar years. The Profit Monitor sample would be expected to be above average in efficiency and scale compared to the average cattle rearing and cattle other farms in the NFS.

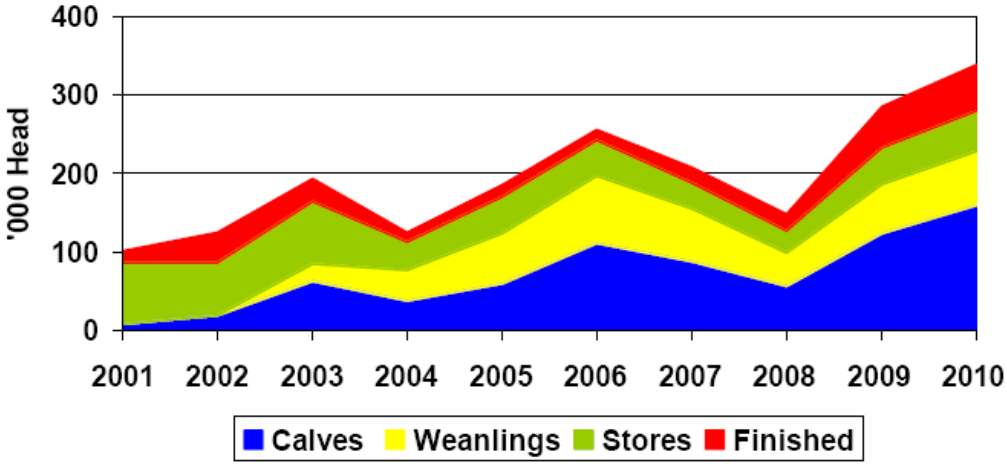
Table 2. Data extracted from "*Increasing Your Profit"* (e-Profit Monitor Report 2009)

Year	Output €/ha	DP €/ha	DP % of output	Output Kg/ha	Output price per kg Beef	Output price € / kg l.w. inc. DP
2004	1,625	698	43%	646	1.43	2.51
2005	1,579	655	41%	619	1.49	2.55
2006	1,640	656	40%	628	1.57	2.62
2007	1,710	683	40%	632	1.62	2.70
2008	1,849	714	39%	609	1.86	3.04
2009	1,781	701	39%	675	1.6	2.64

These analyses show an underlying problem of lack of profitability in cattle farming systems and despite the decoupling of payment farmers continue to use the payment to subsidise their farming systems. If there were more profitable uses for land, would farmers change and retain more of the income? Is there logic in saying that the existing CAP benefits the processor, retailer and consumer more than the farmer because of the attitude of farmers? It is difficult to justify the existing income support side of CAP if those who are meant to benefit cannot retain it.

Against this background the CAP, which supported agricultural production in EU member states for over 50 years is now facing new challenges and must reflect these. These new reforms will affect cattle farmers and it is important that Irish farmers maintain a significant level of support, in particular, if the EU market is further opened up to cheap imports under the EU-Mercosur trade deal. Ireland is the major exporter of beef in Europe and is highly dependent on existing tariffs. Irish farmers are also dependent on live export to EU countries who have specialised markets (Graph 3). The impact of reform and trade deals will indirectly influence these live markets in the response of the farmers in other countries buying Irish calves and weanlings.

Graph 3. Trends in live Exports 2001-2010

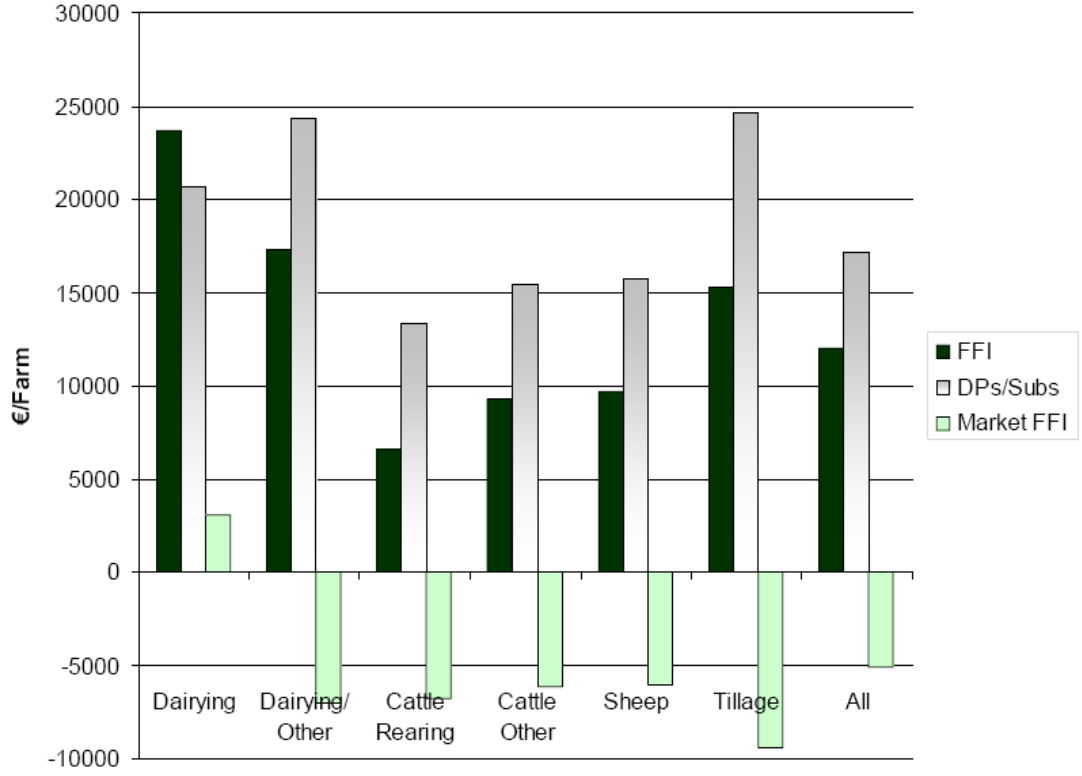


Source: Bord Bia

CAP Payments and the Dependence of Cattle vs. other farming systems

National Farm Survey results for 2007, 2008 and 2009 show that the value of direct payments to full time farms were greater than FFI on cattle rearing, cattle other and mainly sheep farm systems. In all years, FFI was greater than direct payment receipts on dairying farms. On mainly tillage and dairying and other farms in some years direct payments were greater than FFI, in others years direct payments were less. The dependence of FFI on part-time farms is even greater.

Graph 4. Contribution of direct payments to average Family Farm Income (FFI) by Farming System (NFS 2009)



CAP payments and Farm efficiency

The proportion of individual farmers' income made up from direct payments as effected by efficiency. Analysis of 2010 Profit Monitor shows that where suckler to weanling/store farms were ranked on gross margin/ha and the top third compared to the bottom third there a much higher proportion of direct payments retained as profit on the top 1/3 farms (Table 3). The results show that higher output/ha drive profitability and a higher proportion of direct payments retained. The authors accept that this is a biased sample, however it does point to the absolute need for best practice and high levels of efficiency. These farms clearly have similar costs per ha. but hugely differing output in terms of both kg live weight produced and in output value per ha.

Table 3. Analysis of 2010 profit monitor (n=71)

	Top 33%	Average all	Bottom 33%
Gross output €/ha -DP	1102	839	602
Variable costs €/ha	558	513	517
Gross Margin €/ha	543	326	84
Fixed costs €/ha	461	411	389
Net Profit €/ha	82	-84	-304
Direct payments €/ha	690	631	608
% direct payments retained	112%	87%	50%

The CAP and how it is Spent and Funded

The current CAP has two main components. Pillar I which is made up of income support and pillar II which is largely rural development supports. In Ireland this has been targeted at environmental schemes including REPS etc.

Pillar I: Income support: SPS Direct Payments.
In Ireland, these account for about €1.35 billion.

Pillar II: Rural Development: Less favoured Areas, Environmental schemes – REPS – AEOS, Forestry Schemes, Leader and other structural support schemes.
In Ireland, these account for about €400 million.

The key difference between CAP Pillar I and II from an Irish agricultural perspective is that Pillar II supports are co-financed. Pillar I supports are exclusively paid from the EU budget.

The EU Budget/CAP Reform Debate to date

The EU Commission kicked off the debate on budget review October 2010. In its communication it stated "The Common Agricultural Policy's (CAP) needs to evolve, if only because reference values for direct payments are now a decade old. Reforms of varying intensity are possible: from reducing current discrepancies in levels of direct payment to a major shift, away from income support and market measures to environmental and climate change objectives. In 1988, the funding of agriculture amounted to about 65% of the EU budget, these days it is about 40%".

Last November the Commission published a communication "*The CAP Towards 2020"* which outlined some of the issues and options facing the EU in the current CAP reform process.

This Commission communication outlined 3 major strategic aims of the CAP:

1. To guarantee food security by ensuring viable food production (world demand for food to increase by 70% by 2050).
2. To provide citizens with quality, value and diversity of food produced from the sustainable management of natural resources, which contributes to action on climate change throughout the EU.
3. To achieve balanced territorial development, by maintaining the viability of rural communities, in particular rural employment.

It undertook to make the CAP **greener, fairer, more efficient and more effective** and outlined 3 possible policy options:

Option 1

This option would introduce gradual changes to the distribution of direct payments between Member States, thereby ensuring continuity and stability with the current CAP.

Option 2

This option would involve a major overhaul of the policy in order to ensure that it becomes more sustainable, and that the balance between different policy objectives, issues of farmers and Member States are better met. This option would mean more targeted measures which would be more understandable to the EU citizen. A focus on the EU value added and a policy that addresses EU economic, environmental and social challenges and strengthens the contribution of agriculture to rural areas.

Option 3

This option would involve far reaching reform of the CAP with a strong focus on environmental and climate change objectives, while moving away gradually from income support and most market measures. This would provide a clear financial focus on environmental and climate change issues through the rural development policy framework.

The recent Agricultural Council of Ministers meeting on the 17th of March 2011 agreed by majority with these aims and underlined the need for direct income support

for EU farmers to ensure fair standards of living. It broadly agreed with the provision of compensation for EU's higher environmental and animal welfare standards.

In the declaration, ministers said they recognised "the need for a more equitable distribution of direct income support between member states, stepwise reducing the link to historical references". New objective criteria should be found for distributing direct payments while avoid any sudden change.

The European Commission is due to make proposals on the EU's next Financial Perspective (2014-2020) by the end of June 2011 - including on the future CAP budget - and then to come forward with detailed legislative proposals on the CAP reform in October 2011.

Size of CAP

In justifying the CAP post 2013 there will need to be a clear signal to the European public that CAP expenditure is strategic and that there are benefits to taxpayers (so-called added value of community policies). The CAP currently costs €50 billion per annum and represents 40% of the EU Budget. In 1989 CAP represented 60% of the EEC Budget.

Indications are that there is little scope to increase the CAP budget, this will be more evident later this year in the detailed budget proposals.

Distribution of funds between Member States

There are serious issues being raised by the 12 newer entrant countries as to what additional CAP support will transfer to them in a reformed CAP.

The EU Common Communication Nov. 2010 explains the possibility of a system that limits the gains and losses in these regions so that each state will receive a minimum share of the EU average payments.

The Irish view is that the current distribution must form the basis of the future system and that it must be based on an eligible area, not the utilisable area. The difference between these would amount to Ireland being 22% above the average per ha payment of €249/ha on a utilisable agricultural area base or exactly matching the €249/ha charge on an eligible area basis. In terms of average net direct payments

per beneficiary the Irish farmer's average receipt of €9,000 would be approximately €2,000 higher than the average for the EU 27.

Fair distribution must recognise the higher cost members and be separate from the models used in each member's state to distribute the payments.

Another important issue is the contribution of member states to the EU budget. Ireland benefits to the extent that we receive 1.89 times what we pay into the EU while Greece, Spain, France and Germany benefit by 2.59, 1.1, 0.95 and 0.61 times their contribution respectively. New members Bulgaria, Hungary, Poland and the Czech Republic benefit by 6.23, 3.92, 3.01 and 2.1 times their contribution.

Distribution within member states

There are also issues of the scale of payments being made to individuals. The arguments here are mainly from a public taxpayer's point of view; why should one very wealthy person get a huge payment rather than distributing that evenly among others. This raises important issues when the current CAP is being defended.

Argument 1: This is a critical income support.
Response: Why do 80% of the payments go to 20% of the farmers?

Argument 2: This is a vital payment for environmental, social and other public goods.
Response: Bigger farmers have more land and should be compensated equally for adopting better environmental practices.

Some studies which looked at equalisation of payment in Ireland showed that it would result in a geographical shift of payment from the East and South to the North and West. In one study (Gilligan, 2007) this would result in a 13% gain in payment in the BMW Region and a loss in the South and East region of 9% with some areas looking at a 20% loss. Shresthra et al (2007) concludes that in particular large beef and dairy farmers in the southern regions would lose out while small dairy and sheep farmers in the western and northern regions were most likely to gain.

The recent farm council meeting gave little support to capping or reducing payments to higher payment recipients.

Active Farmers

The EU proposes to limit payment to active farmers in response to concerns from taxpayers that public funds are being used to finance lifestyle farmers or non-productive farmers and they would like to ensure that funds are being used to support sustainable production systems. There is little information yet on what criteria might be used to define active and non-active farmers. It is likely that any attempt to introduce objective criteria to differentiate farmers could be prohibitive due to complexity and cost and will be left to individual Member States.

Shift of Funding for Income Support to Rural Development

The EU Commission communication also proposes stronger emphasis on the support of production, protection and competitiveness in its funding for rural development while continuing with strong environmental and rural viability supports. The income support needs to be greener with more equitable distribution of funds and a continuation of safety net market supports. A major concern here is that this will be used to dilute the income support or even promote co-funding from national governments for Pillar 1.

Simplification

It is proposed that a separate simplified scheme should be designed for smaller farmers. The area based system works well. However, it is placing the same requirement on large and small farmers, it may be difficult to separate out. There is also pressure to reduce the amount of administration costs from the member states.

References

National Farm Survey, (NFS) 2007-2009.
http://www.agresearch.teagasc.ie/rerc/farm_surveys.asp
The CAP toward 2020, (2010) http://ec.europa.eu/agriculture/cap-post-2013/communication/com2010-672_en.pdf
Galligan, K.J. see DAFF presentation
www.agriculture.ie/media/migration/.../CAP2013stateofplayNov10.ppt
Shrestha, S.,Hennessy, T.and Hynes, S. (2007). The effect of decoupling on farming in Ireland: a regional analysis Irish Journal of Agriculture Research 46: 1-13
http://www.teagasc.ie/research/journalarchives/vol46no1/1-ijfar-46-3306.pdf

Increasing your Profit from Drystock
http://www.teagasc.ie/publications/2010/43/IncreasingYourProfitFromDrystockFarming.pdf

The authors would like to acknowledge the help of Kevin Hanrahan and Brian Moran Teagasc, Athenry and Kevin Connolly, Teagasc, Monaghan.

Potential for Increased Profitability on Irish Cattle Farms - Lessons from the Teagasc/Farmers Journal Better Farm Programme

Aidan Murray Teagasc Beef Specialist, Teagasc Grange

Summary

- Insufficient output is one of the main reasons for poor profitability on suckler farms. Although price is often blamed, farmers need to target areas in which they have control, within the farm gate. Areas such as increased stocking rate, better breeding, animal performance and better grass utilisation, as targeted in the Teagasc/Farmers Journal BETTER Farm Beef programme. It has been clearly shown that there is potential for significant gains.

- The use of accurate information in terms of financial and physical data are crucial not only in highlighting the strengths and weaknesses of a farming system and monitoring progress but in laying down targets and keeping us all focussed, advisers and farmers alike.

- The full potential of grazed grass on many cattle farms is not being exploited. The programme has confirmed that with a targeted approach, the value of good grassland management can be clearly demonstrated, as well as the cost savings it can deliver.

- The programme has also highlighted a number of areas that need further research. A maternal index for sires to breed replacements for the suckler herd needs to be validated.
- An approach that encourages a more proactive health planning element needs to be urgently examined.

- The clearest message from the programme has to be to simplify the farming system and to remain focussed.

The Teagasc/Farmers Journal BETTER Farm Beef Programme was launched in September 2008. The word BETTER is an acronym for **B**usiness, **E**nvironment and **T**echnology through **T**raining, **E**xtension and **R**esearch.

The aim of the programme is to develop a road map for profitable beef production through focussing on improving technical efficiency at farm level. In order to increase profitability the programme has focused on:

- Increasing farm output
- Controlling production costs

Farm Selection

The 16 farms on the programme are suckler cow based enterprises. They represent a range of systems from suckler to weanling/store to suckler to beef. The herds are predominantly spring calving although some of the herds have a sizeable autumn calving component. Herd sizes range from 32 – 125 cows. One of the key criteria in farmer selection was farmer attitude and enthusiasm. The farmers in the programme are dedicated and see the value of adopting new technologies and are always seeking to improve. This is an aspect that cannot be overlooked in promoting any development programme.

Importance of Baseline Information

The importance of having accurate baseline information at the beginning of the programme or change process can not be understated. All farmers in the programme were required to complete a 2008 profit monitor and sign up to ICBF Herdplus by January 2009.

The purpose of collecting this information was to identify a number of Key Production Indicators (KPI's) and to assess the starting position of each farm. It will also allow progress over the course of the 3 years to be monitored.

The information collected afforded the management team an insight into to the strengths and weaknesses of each unit before the team actually visited the farm to discuss the possible options and to draw up a farm plan.

It was decided early on in the programme to focus at improving gross margin per hectare (ha). A target of €1000 / ha was set. Gross margin was selected as that it is a good indicator of the level of technical efficiency being achieved on farm. It can only improve by driving farm output and controlling costs.

There was a conscious decision taken by the management team that farmers would not incur large capital expenditure so the team had to work within the confines of the

existing animal housing and infrastructure on the farms. Although net margins being achieved are not reported, both fixed costs and net margin are monitored.

The Farm Plan

The farm plan was agreed for each farm. The first page of the farmplan summarises the starting position of each farm in terms of key physical and financial indicators. It also sets out the targets to be achieved by the end of the 2011.

The subsequent pages of the plan identifies a number of keys areas such as:

- Financial performance
- Physical performance
- Grassland management
- Breeding performance
- Winter feeding
- Animal health

Within each of these areas the starting position is outlined and then Target/Actions needed outlined. The purpose of the farm plan is to clearly and simply state the farm targets and to maintain the focus of the team.

The plans are reviewed annually, and, if necessary, amendments made to reflect changes in the market or if it was found that something was not working on the farm.

Focus on Output

If gross margin per hectare is to be improved, the starting point is to examine the level of output. Even with average or modest variable costs, gross margin will be poor if output is poor. This is a major issue on many Irish cattle farms and it needs to be targeted if profitability is to be improved.

In examining the 2008 Profit Monitor Results (n=252) the average suckler farm was stocked at 1.71 LU / ha. Output was 505kg liveweight / ha or 296kg / LU. This translated into a gross output value of €926 / ha. With variable costs of €531 / ha, the average gross margin was €395 / ha.

Table 1. Profit Monitor Result 2008 and Better Farm Results 2008

	2008 ePM Results	**2008 BETTER Farms**
Stocking Rate LU / ha	1.71	1.85
kg liveweight / ha	505	536
kg liveweight / LU	296	292
Gross output Value €/ha	926	1016
Variable costs €/ha	531	630
Gross Margin €/ha	**395**	**386**

The trend was similar on the BETTER farms. With a marginally higher stocking rate, the BETTER farms generated a gross output of €1016 / ha. The extra output value however was eroded due to higher variable costs, leaving a gross margin of €386 / ha. This was lower than that of average all the profit monitor group.

Increasing Output

The programme has targeted an increase in output on the farms both in terms of kilograms of liveweight produced and increased output value. This increase in output has been targeted through:

- Increasing stocking rate
- Improving breeding performance
- Improving individual animal performance
- More astute marketing

Stocking Rate

At the start of the programme the average stocking rate on the BETTER farms was 1.85 LU / ha. The target was a stocking rate of 2-2.2LU/Ha by 2011. The stocking rate has increased to 1.93 and 2.02 LU / ha in 2009 and 2010, respectively. A number of the farms have brought about this increase in stocking rate by increasing stock/cow numbers.

Breeding Performance

With margins from suckling low, and suckler cows an expensive animal to maintain it is important that cows in our herds are *fit for purpose*. In other words, they need to be productive, producing a live calf every year, of good quality that achieves a good weight for age in a grass based production system.

ICBF have highlighted astonishingly poor productivity in our suckler herds. Typically, the output is 0.80 calves per cow per year.

The BETTER farm programme has targeted culling poor performing cows. Using the ICBF Herdplus, individual cow breeding performance is recorded and combined with strategic weighing of their progeny, poor performers are quickly identified and culled.

Calving spread was very protracted on many the farms. This leads to increased labour, more stock groupings, potentially more disease problems and lack of focus. The programme has been working towards confining the calving spread to a 12 week period for both spring and autumn herds. Defined breeding dates, pulling back of late calvers and breeding heifers 2 weeks before the main herd are all central to achieving this target. A number of herds moved the start of their calving to coincide with grass growth in their area to reduce feed costs, improve performance and consequently profitability.

Selecting sires to suit cow type, ease of calving for heifers and manipulating cow condition have all helped reduce mortality at calving on the farms.

The progress made as a result of the focus on breeding performance is evident from Figure 1 below. Calves per cow per year has increased from 0.87 in 2007/08 to 0.90 in 2009/10.

Females not calved in the herd is down by 2%. Mortality at birth has dropped from 4.5% at the start of the programme to 2.8% last year. Mortality at 28 days is down only marginally to 5.1%, despite better hygiene and management around calving.

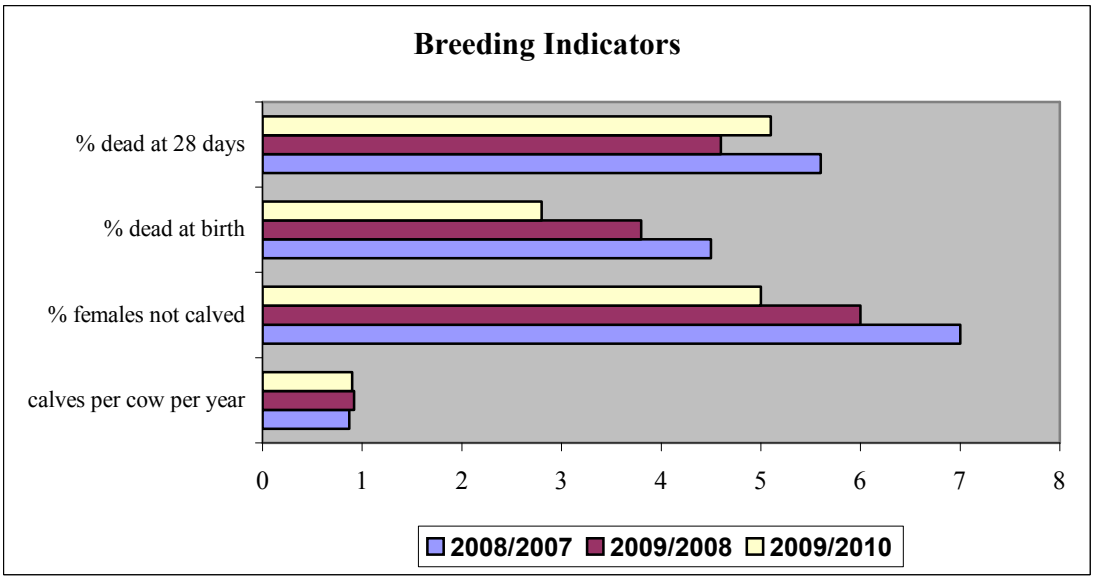


Figure 1. Breeding Indicators on BETTER Beef Farms 2008-2010

Animal Performance

With improved breeding, more calves on the ground and potentially better quality calves can be expected. To capitalise on this, the programme has targeted achieving good weight for age in stock as a means having more kilograms of liveweight to sell off the farms each year. This gain has to be achieved efficiently and costs controlled.

Grassland

Grassland management on the farms is a key focus area of the programme. A lot of time and effort was put into grassland management in the first year of the programme to show the benefits of what could be achieved from grass and to give the farmers the skills and confidence to become competent grassland managers.

All the farmers now:

- Walk their farms weekly to assess grass covers,
- Close up in rotation each autumn,
- Target early turnout of priority stock,
- Maximise the length of the grazing season,
- Identify their poorer performing grass fields and target reseeding,
- Have more paddock divisions in place,
- Work to a fertiliser plan based on soil test result,
- Use slurry more effectively.

All these improvements, reseeding, setting up paddocks, addressing low phosphate and potassium problems on farms have come as an immediate cost. However, over the medium to longer term, the farms will be better placed to exploit the potential of grazed grass.

Weight Recording

Various categories of animals are weighed in the programme to monitor performance. Animals are generally weighed at housing, at turnout and mid season. This has allowed animals to be assessed in terms of weight for age and in a number of cases signalled that performance has been below what we expected for whatever reason.

Animal Health

Unexpectedly, animal health issues have commanded considerable attention on a number of farms. The impact of an underlying health issue on some of the farms not only affected animal thrive and, therefore, output but added significantly to costs.

Health screening of the herds prompted increased vaccination in some cases. In the case of BVD further screening and removal of Persistently Infected (PI) animals. From the 14 herds that used the ear notch test to detect PI's, 32 PI animals were found, with up to 10 PI animals in the more severely affected herds.

Involvement of the local vet and regional veterinary laboratories and Animal Health Ireland has led to a more proactive approach in dealing with animal health issues on the farms. Later on this year, all the farms will have an animal health protocol in place based on their own animal health plan.

The measures already mentioned have clearly had an impact on the output on the farms as can be seen in Figure 2 below. The kilograms of liveweight per hectare have increased by 155kg to 691 kg / ha an increase of 29% since 2008. Likewise output per livestock unit is also up by 49 kg / LU over the same period.

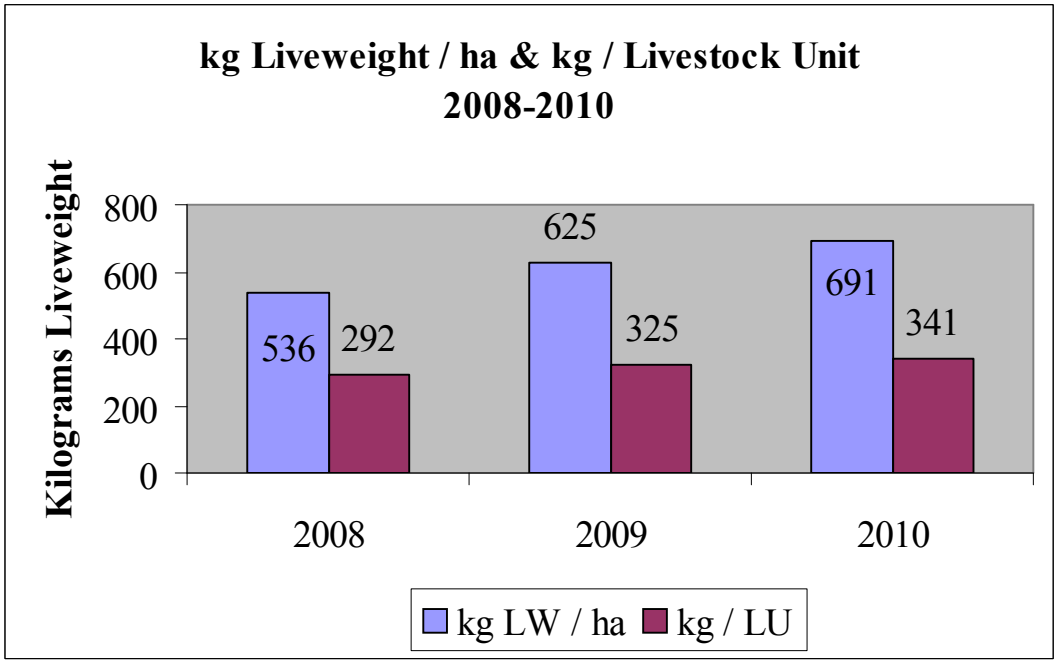


Figure 2. Kilograms of liveweight produced per hectare and per livestock unit on the farms

The magnitude of this increase is best illustrated in Figure 3 below which shows that on average the total kilograms of liveweight produced per farm has increased by 11,261kg since 2008. This is an increase of 32.8%.

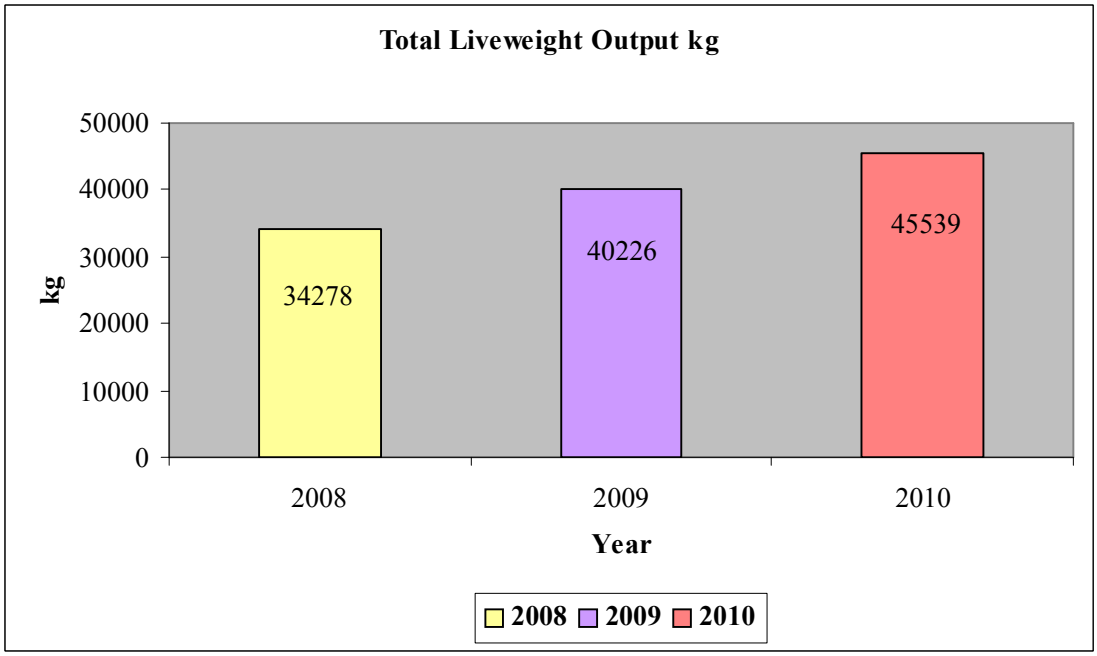


Figure 3. Total kilograms of liveweight produced per farm 2008-2010

Marketing of Stock

Having extra kilograms to sell is progress but the value achieved per kilogram for animals sold as weanlings, stores or finished will impact on gross output value.

Assuming that the old adage of *'you only sell once'* is true then the farmer needs to know the market and costs, if the value of stock is to be optimised.

In 2009 a number of the BETTER farms sold stock at high prices and this is evident from the extra output value achieved, despite beef and store price being poor, relative to 2008 figures. After completing budgets, a number of the farms chose to sell stores rather than finish cattle. Again in 2010, faced with increasing concentrate, the budgeting exercise pointed towards selling stock earlier.

Completing budgets at various stages of production gives clearer direction in terms of deciding the optimum time to market stock. This is continuously changing as beef/store prices and input prices fluctuate.

Gross Output Value Improves

Increasing stocking rate, improved animal performance and improved management have all contributed to delivering more kilograms of liveweight on the farms. Combine this with more targeted selling and higher gross output values on the farms is evident.

Figure 4 below shows how gross output on the farms has increased from €1016 / ha in 2008 to €1276 / ha in 2010. This is an increase of 25.6% in gross output value.

Variable Costs

The graph also plots the movement in variable costs associated with achieving this extra output from 2008 to 2010. Variable costs have increased by 13% from 2008 to 2010. As a proportion of gross output, variable costs in 2008 accounted for 62% of output. This dropped to 60.8% and 55.8% of output for 2009 and 2010, respectively.

While the trend towards lower variable costs as a % of output is positive, variable costs are still high. The target is variable costs at 45% of gross output.

The farms have incurred higher variable costs than would be the norm on foot of increased reseeding costs. Fertiliser costs have increased due to extra P&K being applied to address soil imbalances. These costs will have lead to better cost savings in the future as the farms make better use of grass.

With increased fuel (contractor), feed and fertiliser costs in 2011, it will be difficult to make any substantial reduction in variable costs.

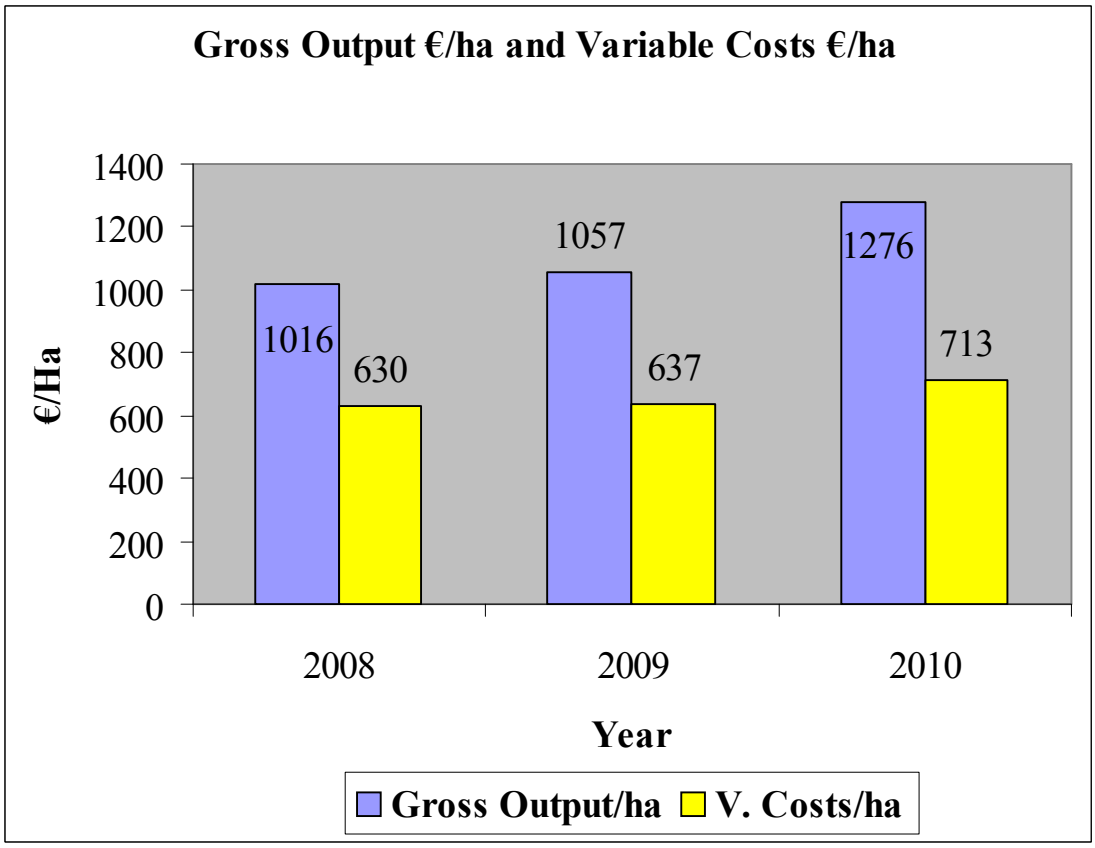


Figure 4. Gross Output € / hectare and Variable costs € / ha 2008-2010

Gross Margin

Although the target of a gross margin of €1000 / ha has not been achieved, the farms on the programme have made steady progress when compared with the average suckler farm completing the profit monitor.

In 2008 the BETTER farms had a gross margin of €386 / ha compared to €395 / ha for average farm in the profit monitor. In 2009 the BETTER farms increased gross margin to €419 / ha while the other group fell to €313 / ha. In 2010 the BETTER Farms showed a further increase to €563/Ha and the Profit monitor group moved to

€367/Ha. Over the 3 years, an improvement of 45.8% in gross margin has been achieved, while the average suckler farm in the profit monitor has seen gross margin decrease by 7%.

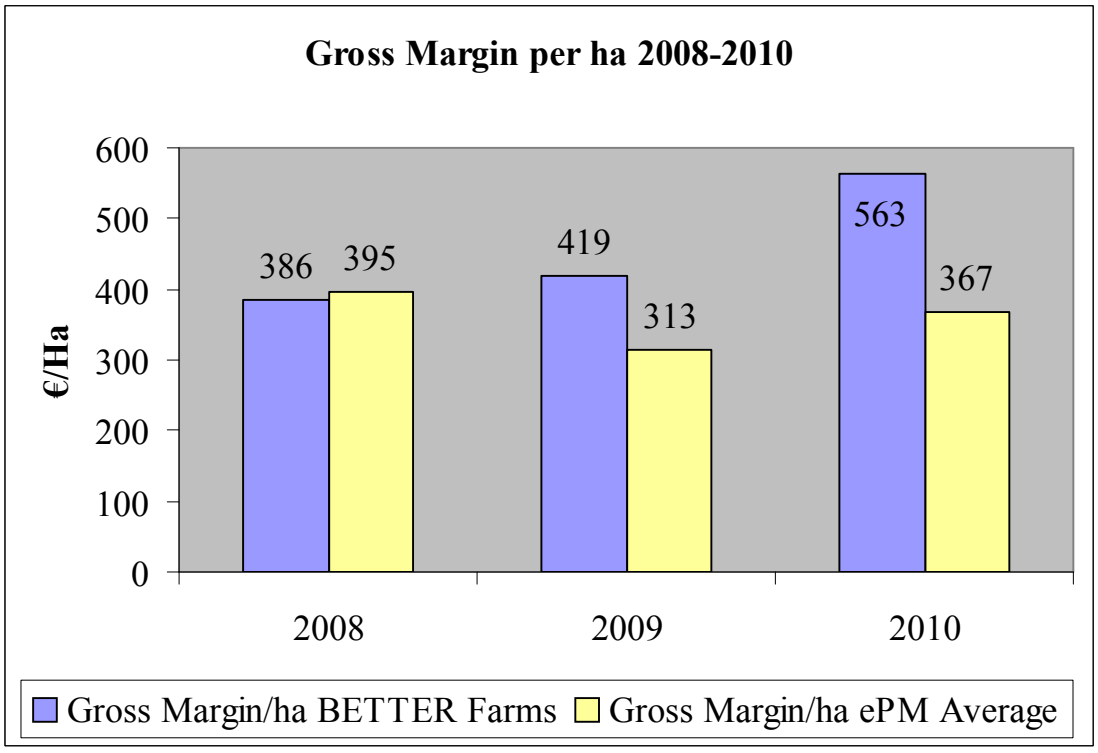


Figure 5. Gross Margin / ha on the BETTER Farms, compared with the average suckler farm completing the Profit Monitor 2008-2010.

Realistically, it would be expected that the average gross margin on the BETTER farms will be €700-800 / ha in 2011. Most of this will come from further improvements in output both in terms of kilograms produced and improved store and beef price. However, with fertiliser costs up more than €100 / t, increased fuel costs and high concentrate prices, it is unlikely that substantial savings can be made in this area.

Suckler beef production in Ireland: Challenges and Opportunities

Paul Crosson and Mark McGee
Teagasc Animal & Grassland Research and Innovation Centre, Grange

Summary

- Cattle and beef production is a key enterprise for the Irish agri-food sector with output in 2009 valued at €1.5 billion.
- Economic performance on farms must be maximised for the most limiting resource. In Ireland's case this is land and thus, profit per hectare is the most relevant measure of profitability.
- Currently, levels of profitability on Irish suckler beef farms are very low although the potential of Irish grasslands to grow high quantities of herbage provide significant opportunities for grass-based systems to generate much higher levels of return.
- The key principles of profitable grass-based suckler beef production systems are operating at high stocking rates, calving in spring with the mean calving date matched to the start of the grazing season, maximising the proportion of grass in the annual feed budget and achieving high levels of reproductive performance and carcass growth.
- Road maps have been developed which provide a framework for achieving desired targets.

Introduction

Suckler beef production is the most widespread farm activity in Ireland. In 2009, there were 1.16 million suckler cows on 75,000 farms (CSO, 2011). Suckler farms have a wide geographic distribution in contrast to many other farming enterprises, which are concentrated in specific locations e.g. tillage farming in Leinster and dairy farming in Munster (CSO, 2007). Thus, suckler farming makes an important contribution to economic activity in diverse regions throughout the country. The value of beef and cattle output in 2009 for the Republic of Ireland was €1.5 billion, representing 38% of total agricultural output, and was the largest single agricultural sector (Department of Agriculture and Food, 2010). Approximately 50% of total beef production, and a greater percentage of output value, derives from suckler beef production and therefore, this sector is a key income generator for the national economy.

Despite the importance of suckler beef farming to the national economy, profitability at farm level is extremely low, with average family farm income (FFI) in 2009 of €221/ha (Connolly et al, 2010). When direct payments, such as the Single Farm Payments and REPS payments, are excluded, the market-based FFI in 2009 was -€230/ha. It is apparent that suckler farming in Ireland is heavily dependent on direct payments to remain viable. Furthermore, suckler cow numbers are showing a downward trend (Figure 1; CSO, 2011), a worrying reduction in a key national asset. Although low financial margins from beef farming are evident world-wide (Agri benchmark, 2006), there are a number of factors which favour Irish livestock production and these factors, if exploited, provide considerable opportunities to increase profitability on Irish suckler beef farms. The capacity to grow high yields of highly digestible grass at low cost (Finneran et al., 2011) is a key competitive advantage of Irish livestock systems particularly given current high concentrate feed prices. Irish suckler beef farms also operate at very low stocking rates (Connolly et al., 2010), thus higher output is readily achievable on many farms at modest cost.

The objective of this paper is to outline the key factors that contribute to farm profitability on Irish suckler beef farms. Clearly, the most important issue influencing farm profitability is input costs and the final product price; however, these aspects are largely outside of the control of individual farmers. Therefore, the focus of this paper is on the factors inside the farm gate influencing farm profitability for suckler beef farms.

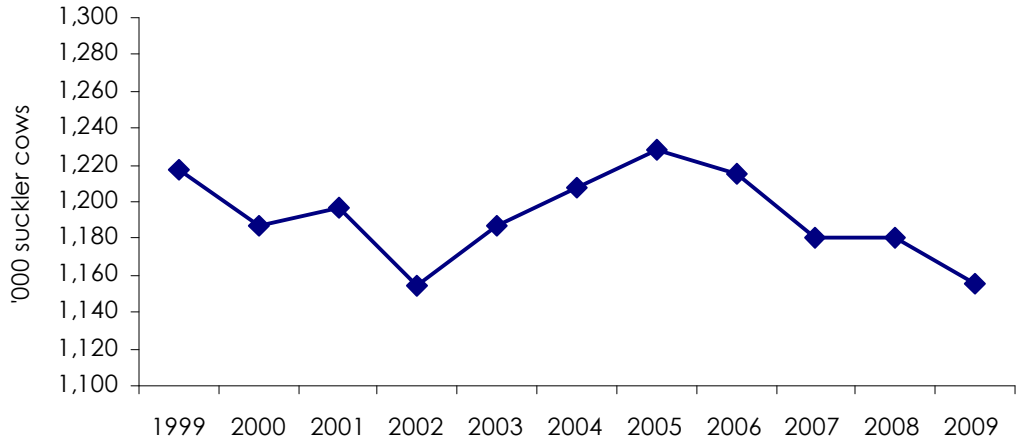


Figure 1. Suckler cow numbers in Ireland 1999-2009 (Source: CSO, 2011)

Profitable and sustainable suckler beef production

Beef farming systems must be both profitable and sustainable in order to provide positive margin to labour and (non-land) assets employed in the longer term. In general, profitability must be maximised for the most limiting resource available on the farm. For individual farms, the most limiting factor may be facilities, cow numbers, and labour or land area. Therefore, the respective profitability measures of most relevance in these individual circumstances are margin per livestock unit (LU), per cow calving, per unit labour employed or per hectare. Under Irish circumstances, land area is the most limiting factor since the remaining factors should not be long term limitations on profitability. Hence, the analysis conducted at Grange and reported in this paper is based on margin per hectare. Sustainability can refer to financial, labour and/or environment. Of increasing interest, particularly to international markets, is the "carbon footprint" of agricultural products. This refers to the greenhouse gas emissions associated with the production and provision of goods or services. In this regard a recent EU study has shown that Ireland is very competitive with a carbon footprint of 18.4 kg CO_2-eq/kg beef (carcass) as opposed to the EU average of 22.2 kg CO_2eq/kg beef carcass (Figure 2).

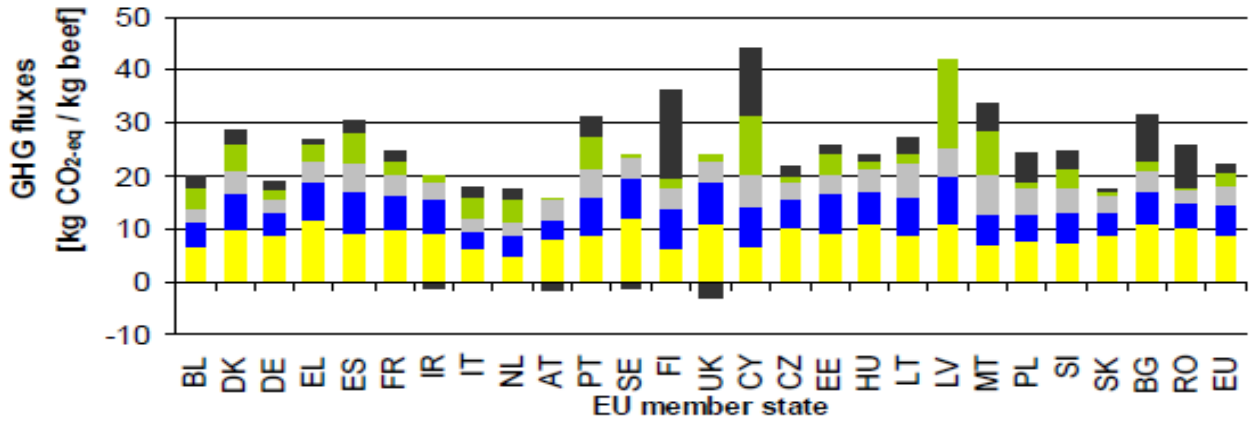


Figure 2. The carbon footprint of beef for 26 European countries (Source: EC JRC, 2010)

The main focus of this paper is profitability. Research at Teagasc Grange has identified five key areas underpinning farm profitability for Irish suckler beef farms as follows:

1. Production systems
2. Stocking rates

3. Calving date
4. Grassland management
5. Animal productivity

In the following sections, each of these areas will be discussed with respect to the impact on whole farm economic performance.

1. Production systems

There are a myriad of production systems operated on suckler beef farms throughout Ireland, based on markets, tradition and demographics. Recent analysis at Teagasc Grange looked at the profitability per hectare of a range of suckler beef production systems where progeny were sold as weanlings, yearlings, stores (18 months of age) or as finished cattle (McGee et al., 2011). The results of this analysis are presented in Figure 3 with net margin for weanling systems set to a base of 100. It is apparent from these results that weanling systems returned substantially lower margins than any of the alternative systems. The main reason for this is that the annual costs of keeping a suckler cow (approximately €400 in this analysis) are high and where this cost is allocated over a greater value of output, profitability is greater. Clearly, there are also opportunities for farmers targeting the live export market to attain substantially higher weanling prices and farm margins from weanling and yearling production systems. However, the proportion of suckler progeny exported live is small and thus, this is likely to remain a niche market. In general, where profit is the primary objective and production efficiency is maintained, this analysis indicates that production systems taking progeny to sale dates later than weaning, are more profitable.

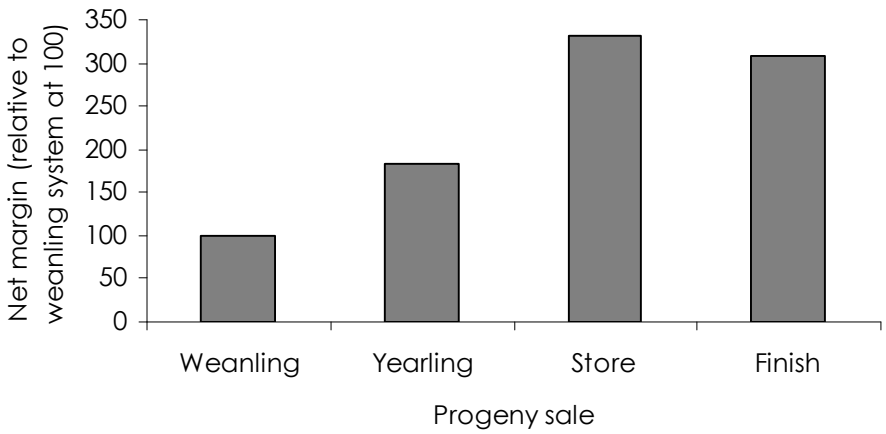


Figure 3. Comparison of net margin from alternative suckler beef production systems (Source: McGee et al., 2011)

2. Stocking rates

Stocking rates on suckler beef farms in Ireland are very low as indicated by the Teagasc National Farm Survey (NFS; Connolly et al., 2010), with a mean value of 1.05 LU/ha in 2009. Correspondingly, output value and gross farm margin were also very low at €414/ha and €108/ha, respectively. Furthermore, the level of output generated was insufficient to generate a positive net farm margin when direct payments were excluded. The average stocking rate for farms completing Teagasc eProfit Monitors in 2009 was 1.73 LU/ha. Corresponding output value and gross margin was €849/ha and €313/ha, respectively, indicating that higher stocking rates can support higher margins. Although net farm margin was also negative, these farms have much higher fixed costs than corresponding NFS farms. An investigation of the 2008 Teagasc eProfit Monitors clearly illustrates the positive relationship between stocking rate and profitability (Figure 4).

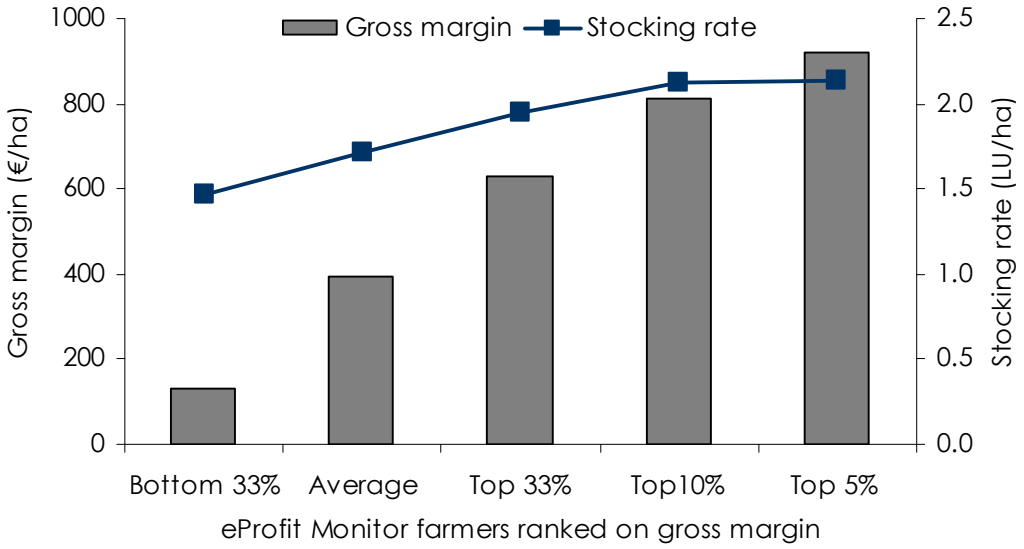


Figure 4. Gross margin and stocking rate for the 2008 eProfit Monitor (Source: Teagasc, 2009)

The sectoral road map for suckler beef developed by Teagasc has specified a target stocking rate increase of 18% for the beef sector by 2018 (Table 1). Accordingly, it is anticipated that liveweight output would increase by 27% when these stocking rate increases are allied to additional increases in production efficiency (see full suckler

beef sectoral road map for further details). In contrast, the research targets set for the Grange Derrypatrick Herd are much higher with stocking rates of 225 organic N per ha (sectoral target for 2018 is 130 kg N) and a net margin of greater than €600/ha. The target net farm margin is driven largely by high stocking rates allied to high levels of individual animal performance within grass-based production systems. Clearly, this stocking rate requires much greater levels of management and labour input than what might be available on many farms. However, this stocking rate is within the permissible limits under the Nitrates Directive and thus, this system is currently under evaluation at Grange to investigate the potential to maximise profitability within integrated suckler calf to beef production systems.

Table 1. Sectoral averages and Grange production stocking rate targets, liveweight output and net farm margin

	Sectoral average		**Grange**	
	Current	*2018*	*Standard*	*Derrypatrick*
Organic nitrogen (kg/ha)	110	130	210	225
Liveweight output (kg/ha)	457	580	1,065	1,183
Carcass output (kg/ha)	250	317	586	666
Net farm margin[1] (€/ha)	-110	5	340	610

[1]Return to land and labour employed

3. Calving date

Suckler beef production in Ireland is predominantly based on spring-calving cows with 70% of calvings between January and May. However, there continues to be an interest in autumn-calving systems. A key motivation for autumn-calving in many cases is to provide weanlings for the premium priced, live export market. This market requires E and U grade weanlings and in this respect, autumn-calving systems facilitate greater use of AI as cows are indoors during the breeding season, thus providing for increased sire selectivity and higher quality (muscularity and weight for age) progeny. Autumn-born weanlings are also available for sale earlier in the season and can therefore, avoid the peak weanling supply period in late autumn. Where sale is delayed until this peak supply period, sale live weight is greater and hence, weanling/yearling value is also greater. Where a split-calving pattern is operated, i.e. calving a proportion of the cow-herd in spring and the remainder in autumn, a further advantage is that labour requirements are not concentrated into a single period. However, autumn-calving systems are associated with higher costs

relative to spring-calving systems. Firstly, feed costs are typically greater because the cow is lactating during the winter indoor feeding period and requires higher quality (more expensive) silage and/or concentrate supplementation. Secondly, housing/facility costs are greater as additional creep areas for calves are required. Figure 5 illustrates the impact of calving season on net farm margin for suckler calf-to-weanling systems. Three results are apparent: 1) Spring-calving systems are more profitable at all weanling prices. 2) The profitability of autumn-calving systems increase at a greater rate as weanling price increases. In essence, the additional weanling price is captured to a greater degree by the additional liveweight output from autumn-calving systems. 3) A weanling price of €167/100 kg and €204/100 kg is required to breakeven in spring- and autumn-calving systems, respectively.

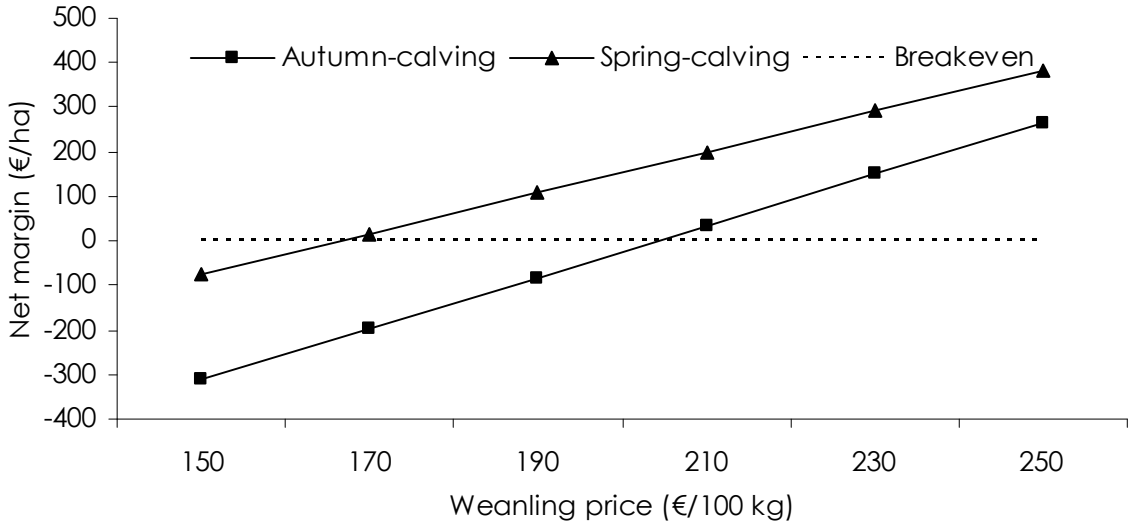


Figure 5. Impact of calving date on net farm margin for suckler calf-to-weanling production systems (Source: Crosson and McGee, 2011).

For spring-calving systems the date of calving is also of interest i.e. what is the optimum spring-calving date. If mean calving date is too early, i.e. prior to the start of the grazing season, lactating suckler cows will require supplementary feeding and/or higher digestibility (more expensive) grass silage. Conversely, if calving date is delayed until after the grazing season begins, the economic advantage of early spring grazing will not be captured i.e. dry, pregnant cows will remain indoors on more expensive grass silage despite the availability of cheaper grazed grass. Research at Grange has shown that delaying calving date by 3 weeks or 6 weeks

reduced profitability by 9% and 19%, respectively (Figure 6). This equates to a reduction in profitability of €1.41/cow for each day that calving date is delayed. In this analysis, no performance effect of turnout date is assumed and therefore, the effects are due to differences in feed costs and slurry handling costs.

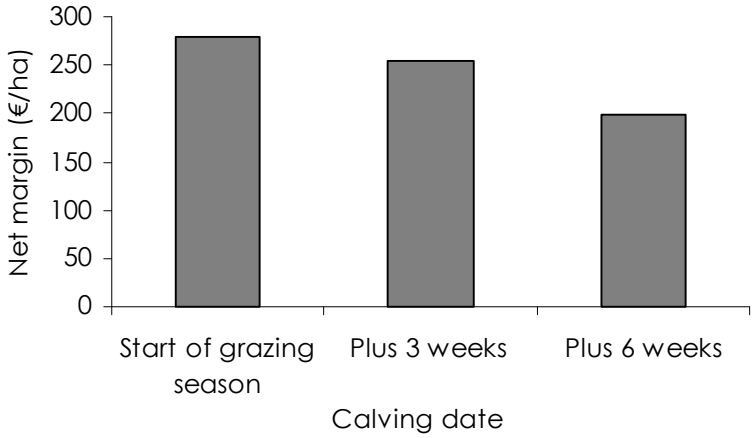


Figure 6. Impact of calving date on net farm margin for suckler calf-to-beef production systems (Source: Crosson et al., 2009b).

4. Grassland Management

Irish grassland has the potential to produce high yields of highly digestible herbage due to favourable climate and soil types. Thus, Irish livestock farmers have a competitive advantage when compared to pigs, poultry and cattle feedlot systems, which require high quantities of concentrate feeding. Irish suckler beef production systems must exploit this opportunity to grow and utilise grass efficiently. The technical aspects of growing and utilising grass efficiently are described in the paper by O'Donovan, Hennessey and O'Riordan (this proceedings). A key objective must be to maximise the proportion of grazed grass in the annual feed budget of suckler beef systems. Turnout date of suckler cows and progeny is a critical element influencing composition of the annual feed budget. Where grass is available and where grazing conditions are appropriate, earlier turnout increases the proportion of grazed grass in the total farm feed budget and hence, improves profitability (Table 2). Advancing turnout date by one day increases net margin by €1.54 per cow. Similar to the calving date analysis, effects are due to differences in feed and slurry handling costs. Earlier turnout has also been shown to result in improved animal performance (Kyne et al., 2001; Gould et al., 2010; O'Riordan et al., 2011), although in these studies this advantage is largely diminished by the end of the grazing season due to the effects of compensatory growth.

Table 2. Impact of turnout date of suckler cows on the total farm feed budget and financial performance

	Turnout date of suckler cows		
	Start of grazing season (Feb 23)	*Plus 3 weeks*	*Plus 6 weeks*
Annual feed budget (% of total DM fed)			
Grazed grass	65	62	58
Grass silage	27	30	33
Concentrates	8	8	9
Financial results (€/ha)			
Gross output	1,671	1,672	1,674
Variable costs	927	960	1,015
Gross margin	743	712	660
Fixed costs	432	433	435
Net margin	311	279	225

Source: Crosson et al., 2009b

The start of the grass growing season differs from location to location and therefore, turnout date will also vary. Whilst grazing conditions are largely dependent on soil, climatic and weather conditions and is therefore, largely outside the farmer's control, farmers can have an influence on pasture availability by appropriate autumn grassland management and judicious application of nitrogen (N) fertiliser. Spring response to N is dependent on soil temperature (Black, 2009) and therefore, varies greatly among years and locations. O'Donovan et al. (2004) found pasture response rates ranging from 5.6 to 15.6 kg pasture per kg N applied on free-draining soils in the south of Ireland. Using this range in N response rates, the impact of turnout date and pasture N response rate on net farm margin were investigated for suckler beef production systems and indicated that where N response is lower (i.e. in a later growing location) later turnout results in greater profitability (Figure 7). In other words, on farms where the grazing season begins later, turnout date (and calving date) should also be matched to this date to optimise profitability.

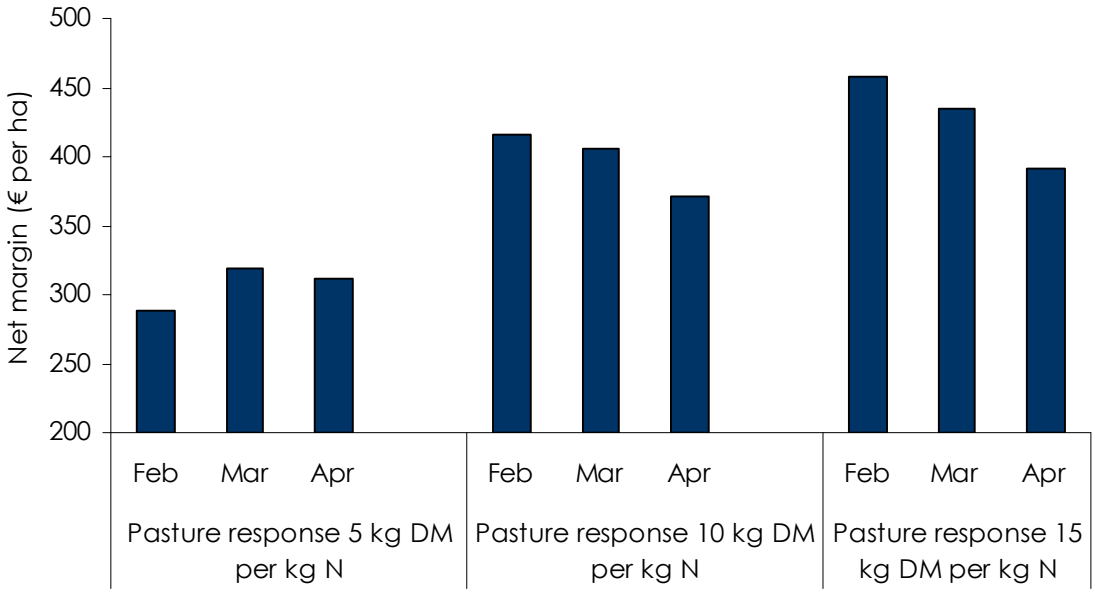


Figure 7. Impact of turnout date and pasture response to N fertiliser on net farm margin for suckler calf-to-beef production systems (Source: Crosson et al, 2009a)

Currently it is estimated that, on average, grazed grass constitutes 49% of the total feed budget on Irish suckler beef farms (Table 3). Total herbage utilised is less than 5 t DM/ha. It is anticipated that the proportion of grazed grass in the annual feed budget could increase modestly and herbage utilised increase substantially (when stocking rate increases are also taken into consideration) by 2018. The modest increase in grazed grass proportion in the annual feed budget is a reflection of a change in finishing systems from a grass-based extensive production system finishing steers at grass at 28 months to a more intensive system finishing steers indoors at 26 months of age. These targets are considerably lower than those set for the Derrypatrick Herd in Grange, where grazed grass and herbage utilised is estimated to account for 60% of the total feed budget and over 10 t DM/ha, respectively.

Table 3. Sectoral averages and Grange target production feed budgets

	Sectoral average		Grange	
	Current	*2018*	*Standard*	*Derrypatrick*
Grazed grass (% of total DM fed)	49	51	51	60
Silage (% of total DM fed)	38	38	31	29
Concentrates (% of total DM fed)	13	11	8	11
Herbage utilised (kg DM/ha)	4,760	5,997	10,048	10,250

6. Animal productivity

To ensure high levels of profitability from suckler beef production systems, animal productivity, or output per livestock unit, must be high. High output per LU is determined by weight for age and carcass quality of the progeny and reproductive performance of the suckler cow herd.

- *Weight for age and carcass quality*

Drennan and McGee (2009) identified three important factors influencing growth rate and carcass quality of suckler progeny: 1) use of late-maturing continental breeds, 2) availing of hybrid vigour and, 3) milk production of the dam. Drennan and McGee (2009) concluded that suckler dams should have at least 50% and preferably 75% of a late-maturing continental breed to produce progeny suitable for higher-priced markets as a result of improved conformation and leaner carcasses. Murphy et al. (2008a,b) found that progeny from crossbred cows with Friesian or Simmental ancestry had higher carcass weight for age than ¾ or purebred beef breed suckler cows (Table 4). These differences in carcass growth reflected differences in calf pre-weaning gain due to milk yield of the dam. However, progeny from cows with Friesian ancestry had poorer conformation and were fatter than those from purebred beef breed cows.

Table 4. Impact of suckler cow breeding on weight for age and carcass conformation and fat score of progeny
(Source: Murphy et al., 2008a,b)

	Beef-Friesian	3/4 beef	3/4 beef (Sim)[1]	Purebred beef
Pre-weaning gain (kg/d)	1.12	1.00	1.07	0.92
Post-weaning gain to slaughter (kg/d)	0.96	0.95	0.98	0.96
Kill out proportion (g/kg)	554	562	558	571
Carcass weight for age (kg/d)	0.61	0.58	0.61	0.59
Carcass conformation score[2]	3.23	3.23	3.36	3.55
Carcass fat score[3]	2.9	2.8	2.8	2.5

[1]3/4 beef breed suckler cows including 50% Simmental breeding.
[2]Scale 1 to 5 (best).
[3]Scale 1 to 5 (fattest)

The implications of weight for age were investigated in a whole farm systems context to elucidate the impact of this single variable on beef output for suckler beef system (Table 5). This analysis suggests that weight for age is a key determinant of carcass output and hence profitability. The implications of this for whole farm profitability were that, for each 25 g/d increase in live weight, net farm margin was increased by €30/ha. Thus, it is apparent that weight for age (and also taking into account carcass traits, as the final product must be commercially saleable and of high value), is an important factor determining profitability for suckler beef production systems.

Table 5. Impact of live weight for age on the carcass weight and beef output of suckler beef production systems

Weight for day of age (g)	925	951	974	1001	1025	1048
Heifer weaning weight (kg)	258	265	271	279	285	291
Bull weaning weight (kg)	282	289	296	304	311	318
Heifer carcass weight (kg)	271	278	283	290	295	301
Bull carcass weight (kg)	334	344	353	364	373	383
Carcass output (kg/ha)	519	537	543	558	569	582

- *Reproductive performance*

Data from the Irish Cattle Breeding Federation (ICBF) suggests that average calving rate (i.e. number of live calves produced per cow on the farm) for Irish suckler beef farms is 0.81. In other words, for every 100 cows, only 81 weanlings are produced. This low level of reproductive performance is an obvious contributor to low levels of profitability on Irish suckler beef farms as the cost of carrying each suckler cow is only offset by 0.81 weanlings.

The calving rate is largely a function of two variables; calving interval and pregnancy rate. Analysis of data from spring-calving suckler cows at Grange between 1987 and 1999 showed that a calving interval of 367 days and a pregnancy rate of 94% were achieved (Drennan and Berry, 2006). This analysis also showed that earlier calving cows had longer calving intervals than those calving later in the spring, however, there was no difference in calving rate. The results show that under appropriate levels of management, good reproductive performance can be attained in a spring-calving suckler herd.

Table 6 shows that sectoral averages and Grange target levels of animal productivity. As a result of higher calving rates and higher weight for age, output per LU is greater for the Grange systems. Target output per LU is 50% greater for the Derrypatrick Herd when compared to the current sectoral average. It is anticipated that improvements in reproductive performance and animal liveweight gain could increase output per LU by 11 kg by 2018. When these levels of individual animal performance are allied to much higher stocking rates, it is evident that live weight and carcass weight output is also much greater.

Table 6. Sectoral average and Grange target levels of animal productivity

	Sectoral average		**Grange**	
	Current	*2018*	*Standard*	*Derrypatrick*
Calves per cow per year	0.81	0.87	0.95	0.95
Carcass weight for age (g/d)	0.42	0.46	0.53	0.61
Carcass weight per LU (kg)	148	159	217	227
Inorganic nitrogen (kg/ha)	71	80	195	195
Liveweight output (kg/ha)	457	580	1,065	1183
Carcass output (kg/ha)	250	317	586	666

Concluding comments

Although profitability is currently low on suckler beef farms in Ireland, there is some reason for optimism. The EU is currently a beef deficit region and with production set to decline by 2% in 2011 (Bord Bia, 2010), this will provide increased opportunities for Irish exports. The capacity of Irish grasslands to grow high yields of herbage at low cost must also be exploited, particularly given the competitive advantage of grass-based beef systems when compared to concentrate-based meat production systems. The Teagasc beef road map for suckler systems provides a framework for current levels of efficiency to be increased, leading to improved levels of economic performance (Table 7). Systems of production should be based around a number of key principles. This involves operating production systems tailored to maximise animal performance within grass-based production systems, producing carcasses that are suitable for high-value markets. There is ample scope for much of the efficiency gains targeted in the road map to be achieved at modest cost. For example, the very low stocking rates prevailing on Irish suckler beef farms mitigate against high levels of grazed grass utilisation – increasing stocking rate could be achieved by increasing utilisation rates with little additional cost to the whole farm system. Furthermore, cost per unit product is reduced substantially when efficiency gains are also taken into consideration.

Table 7. Sectoral average and Grange target economic performance levels

	Sectoral average		**Grange**	
	Current	*2018*	*Standard*	*Derrypatrick*
Cost per kg live weight (€/kg)	1.77	1.52	1.29	1.27
Farm economic performance (€/ha)				
Gross output	699	887	1,514	1,903
Gross margin	262	377	761	1,038
Net margin	-110	5	340	610

References

Agri benchmark. 2006. Beef report 2006 – benchmarking farming systems worldwide. Federal Agricultural Research Centre, Institute of Farm Economics, Bundesallee 50, 38116 Braunschweig, Germany.

Black, A.D. 2009. Influence of date of nitrogen fertiliser application in spring and associated soil temperatures on pasture growth rates with a year-round grazing

system. Proceedings of the Agricultural Research Forum, Tullamore, Ireland, 12-13 March 2009, p.34

Bord Bia. 2010. Irish Food, Drink and Horticulture: Performance and Prospects. 2010-2011. Published by Bord Bia, Clanwilliam Court, Dublin 2.

Central Statistics Office (CSO). 2011. http://www.cso.ie/px/pxeirestat/database/eirestat/Agriculture%20and%20Fishing.asp (Accessed 20 March, 2011)

Central Statistics Office (CSO). 2007. Farm Structure Survey. Central Statistics Office, Information Section, Skehard Road, Cork.

Connolly, L., Kinsella, A., Quinlan, G. and Moran, B. 2010. National Farm Survey 2009. Athenry, Galway.

Crosson P., McGee M. and Black A.D. 2009a. Bioeconomic modelling of pasture responses to nitrogen fertiliser on the financial performance of suckler beef systems. Integrated Agricultural Systems: Methodologies, Modelling and Measuring. Aspects of Applied Biology, 93, 223-226. SAC, Edinburgh, 2-4 June, 2009, p.223-226

Crosson P., McGee M. and Drennan M.J. 2009b. The economic impact of calving date and turnout date to pasture in spring of suckler cows. Proceedings of the Agricultural Research Forum, Tullamore, Co. Offaly, Ireland, 12-13 March 2009, p.68.

Crosson, P. and McGee, M. 2011. An economic comparison of spring- and autumn-calving suckler calf-to-weanling beef production systems. Proceedings of the Agricultural Research Forum, Tullamore, Co. Offaly, Ireland, 14-15 March 2011, p. 77.

Department of Agriculture and Food. 2010. Fact Sheet on Irish Agriculture – August 2010. Department of Agriculture and Food, Agriculture House, Dublin 2.

Drennan, M.J. and Berry, D.P. 2006. Factors affecting body condition score, live weight and reproductive performance in spring-calving suckler cows. Journal of Agriculture and Food Research. 45: 25-38

Drennan, M.J. and McGee, M. 2009. Producing high quality carcasses from grass-based suckler beef systems. Occasional Publication, Teagasc, Grange Beef Research Centre, Dunsany, Co. Meath.

European Commission (EC) Joint Research Centre. 2011. Evaluation of the livestock sector's contribution to the EU greenhouse gas emissions (GGELS). http://ec.europa.eu/agriculture/analysis/external/livestock-gas/ (Accessed 20 March 2011).

Finneran, E., Crosson, P., O'Kiely, P., Shalloo, L., Forristal, D. and Wallace, M. 2011. Stochastic modelling of the yield and input price risk affecting home produced ruminant feed cost. Journal of Agricultural Science. Submitted.

Gould, N., McGee, M., Kenny, D.A., Minchin, W., Lawrence, P. and O'Riordan, E.G. 2010. Effect of restricted access time to pasture in spring on the performance of autumn- and spring-calving beef suckler cows and their progeny. Proceedings of the British Society of Animal Science and the Agricultural Research Forum, Belfast UK, 12-14 April 2010, p. 208

Kyne, S., Drennan M.J. and Caffrey, P.J. 2001. Influence of concentrate level during winter and date of turnout to pasture on the performance of cattle and the effect of grazing of silage ground on grass yield and quality. Irish Journal of Agriculture and Food Research. 40: 23-32

McGee, M., Drennan, M.J. and Crosson, P. 2011. Effect of supplementary feeding level to grass silage and initial spring grazing date on performance of weanling cattle in suckler beef production systems. Irish Journal of Agriculture and Food Research. Submitted.

Murphy, B. M., M. J. Drennan F. P. O'Mara and M. McGee. 2008a. Performance and feed intake of five beef suckler cow genotypes and pre-weaning growth of their progeny. Irish Journal of Agriculture and Food Research. 47, 13-25.

Murphy, B. M., M. J. Drennan F. P. O'Mara and M. McGee. 2008b. Post-weaning growth, ultrasound and skeletal measurements, muscularity scores and carcass traits and composition of progeny of five beef suckler cow genotypes. Irish Journal of Agriculture and Food Research. 47, 27-40.

O'Donovan, M, Delaby, L, Stakelum, G and Dillon, P. 2004. Effect of autumn/spring nitrogen application date and level on dry matter production and nitrogen efficiency in perennial ryegrass swards. Irish Journal of Agricultural and Food Research. 43: 31-41.

O'Riordan, E.G., Keane, M.G. and McGee, M. 2011. Effects of turnout date to pasture in spring and post-grazing sward height on performance of dairy crossbred steers during the grazing season. Proceedings of the Agricultural Research Forum, Tullamore, Co. Offaly, Ireland, 14-15 March 2011, p.86

Teagasc. 2009. Teagasc eProfit Monitor analysis drystock farms 2008.Published by Teagasc, Oakpark, Carlow, Ireland.

Achievements to Date and Future Targets from Grazed Grass

Paul Kehoe, Ballygarrett, Gorey, Co. Wexford.

Farm size

135 ha including 35 ha leased/rented.
Grassland = 129.4 ha
Cereals = 5.6 ha.

Enterprises

- 115 suckler cows.
  The heifers are finished at 20-22 months (350-370 kg carcass). Bulls are finished at 19-22 months (480-490 kg carcass).

- Calf-to-beef (Friesian)
  40-50 bull calves reared for slaughter at 20-21 months following second season at grass.

- Early lambing ewes
  There are 100 lambing in January.

- Lamb fattening
  750 lambs bought as stores from June onwards and finished off grass.

- Cereals
  Spring barley is grown on the out-farm. This provides grain and straw for the livestock enterprises.

Previously the cattle system had been based on selling store bullocks and finishing the heifers with some bullocks also finished.

Land Type – Macamore series (heavy soil) adjacent to coast – in Disadvantaged area.

Breeding policy

Cows are 50% ¾ Limousin, 20% Limousin x Friesian, 30% mixed Continental breeds. A Simmental bull was purchased recently to cross with the ¾ Limousin cows

to breed replacements. Terminal sires used include 1 x Belgian Blue bull and 2 x Limousin bulls.

ICBF Output

Calving interval has improved from 423 days in 2007 to 374 days in 2010. In that period the number of months in which calving has taken place has decreased from 11 to 9. There is still room for improvement in this area. The average suckler beef value for the herd is €64 (3 stars) with the figure for female stock under 12 months being €77 (4 stars).

Labour

The farm is managed and operated by Paul and his father Joseph with assistance of students during busy periods.

Development of farm in recent years

(1) Construction of slatted house with lie-back in 2006 (FWM grant) for cows. Prior to that it was possible to out-winter cattle on sand-banks adjoining the sea. Other slatted accommodation and straw-bedded sheds were built before this.
(2) Emphasis on performance from grass particularly from 2009 onwards.
(3) Infrastructural changes
    a. Installation of extra paddocks and fencing.
    b. Construction of internal farm roadway.

Stocking Rate & Output

The stocking rate on the farm in 2010 was 2.31 LU/ha with a physical output of 788 kg live weight of beef / ha. This compares favourably with the results from the top 1/3 of profit monitors.

Grassland Management

- Involvement in grass group (meets circa 4 times in February-June period),
- 9-10 paddock divisions per group of cattle,
- Use of platemeter (previously a calibrated stick) to measure grass in conjunction with Teagasc worksheets,

- Tight first grazing - start mid to late February,
- Slurry or 23 units of N after first grazing,
- Finish first rotation 10th April,
- Identify surplus grass – 500 bales of silage harvested in 2010.

Financial performance

Financial data available from Teagasc e-profit monitors for 2006-2010 (Figure 1)

Figure 1. Net profit (whole farm)

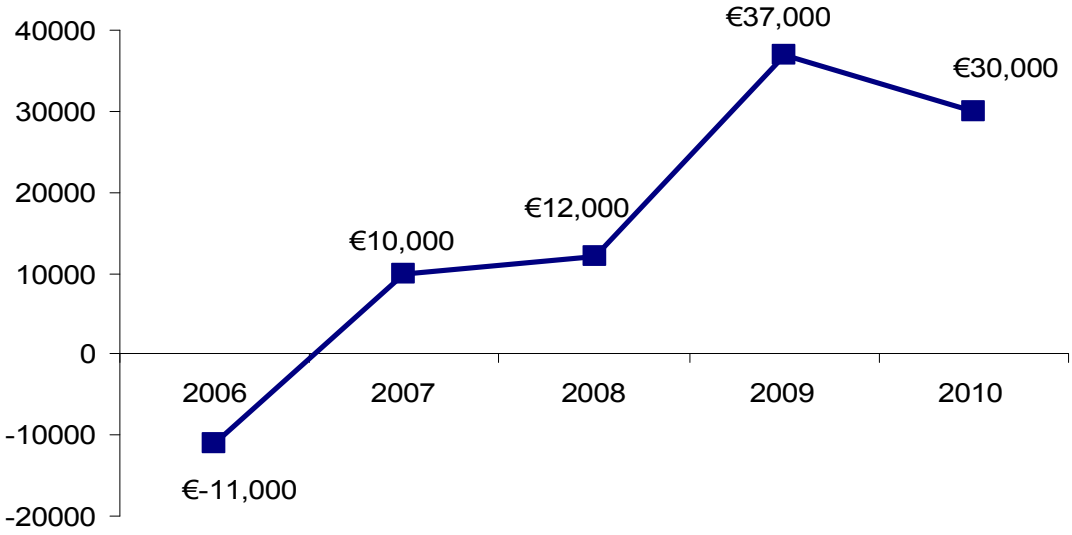
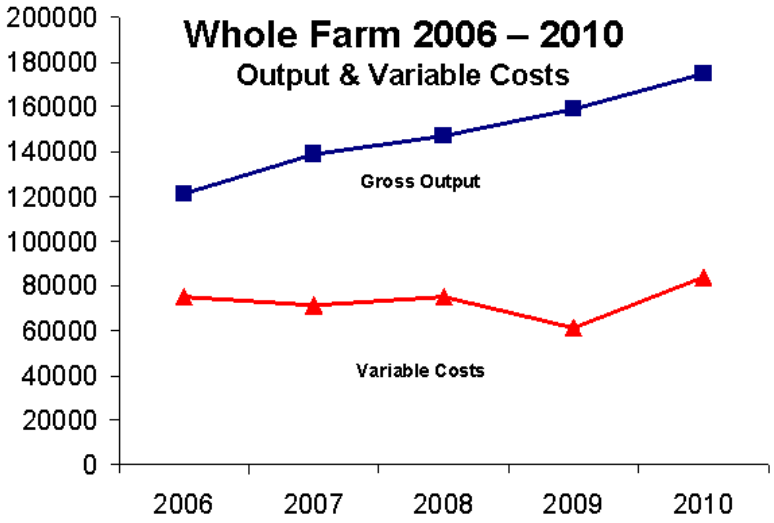


Figure 2. Output and Variable Costs



Fixed costs have remained more or less static at circa €60,000. The main costs include land rental (20%), machinery running (20%) and depreciation (20%). Variable costs have increased very little over the five year period. The primary reason for increase in 2010 was extra meals fed to finishing bulls.

Use of science on the farm:

There is a major emphasis on the use of technology in making decisions. The decision support tools used include:

(1) Discussion groups - I am an active member of the Model County Suckler beef discussion group and a grass group.
(2) Platemeter – This is used for grass measurement and allows me to make decisions about grass surpluses and deficits on the farm.
(3) Weighing scales – the performance of cattle is monitored regularly. Information can be directly downloaded on to computer for analysis.
(4) Testing for BVD – Enfer testing is used on all purchased stock. In 2010 this resulted in a PI calf being identified in a purchased calf. This animal was culled immediately.
(5) Dung sampling – dosing for parasites is based on dung sampling results. This policy of analysis arose out of problems with liver fluke and rumen fluke in recent years.
(6) Silage analysis – winter diets are devised for all classes of livestock on the basis of the forage analysis results.
(7) ICBF – participating in Herd Plus. Herd Plus breeding information service provides a range of farm management aids including Eurostar reports, breeding charts, fertility reports, calving reports, slaughter reports, suckler cow reports and personalised recording notebooks.

Plans for the Future

The main aim on the farm is to achieve the performance both physical and financial of the top 5%, as measured in Teagasc profit monitors. Targets:

(1) Increased output - €1500/ha for beef enterprise (achieved €1307 in 2010). There were a lot of cattle near sale in the closing inventory for 2010, so an increase can be expected in 2011,

(2) Greater focus on grassland management as a means of driving output,
(3) Improve infrastructure – fencing, roadways, re-seeding etc.,
(4) Improve breeding – achieve higher suckler beef values and reduce number of months in which calving takes place,
(5) Prepare for any reduction in the Single Farm Payment by focussing on improving net margin.

Harnessing the Potential of Grass on Beef Farms

Michael O'Donovan, Deirdre Hennessy & Eddie O' Riordan
Grassland Science Research Department, Teagasc Moorepark and Grange

Summary

- Profitable beef production in Ireland is based on the provision of sufficient quantities of high quality pasture to produce quality beef at lowest cost.
- Grazed grass is the cheapest feed on beef farms and offers the most potential to increase profitability.
- Increasing grass utilisation, farm stocking rate and grazing days at grass are the main drivers of increased efficiency.
- Target pre grazing covers of between 1200-1600 kg DM/ha (pre height 8-10 cm) are desirable.
- Mid-season grassland management must focus on offering high levels of green leaf which is the best avenue to increase total grass DM intake.
- Building grass from early August and the use of grass budgeting will increase autumn grass utilisation.
- Planning the closing strategy for the following spring ensures spring grass availability irrespective of over winter conditions.
- Perennial ryegrass/white clover swards have a major role to play on beef farms to increase animal performance, grass quality and reduce fertiliser costs.

Introduction

Future farming systems need to be economically and socially sustainable. Ireland possesses significant advantages that place the agriculture sector in a strong position to progress and take advantage of the rising long-term demand for food. The livestock industry produces meat and milk products for some of the highest value and highest specification markets in the world. Our temperate climate and resulting grass production advantage allows us to exploit the competitive advantages associated with grass-based production systems compared with high input systems.

Economic value of ruminant production to the Irish economy

Ireland exports over 90% of its beef and, in the period since 2000, the share of Irish exports to the lower value and more volatile non-EU markets has declined from over 50% to less than 3%. In addition, fresh beef which is supplied to retail, food services and manufacturing clients in Ireland, and across the EU, now comprises over 90% of all output. Specialist beef production is the dominant type of farming in Ireland, accounting for more than half of all farm enterprises and ranging from 26% to 31% of agricultural output at producer prices in recent years. In 2008 annual turnover was some €2 billion, with beef exports amounting to €1.7 billion representing 20% of total Irish food and drink exports. As with the decrease in the agricultural sector's total export values in 2009, beef exports also fell considerably, to an estimated €1.4 billion.

Exploiting the competitive advantage of Irish production systems

One of the major competitive advantages that Ireland has over many EU countries is the potential annual production of between 12 and 16 tonne (t) grass dry matter (DM)/hectare (ha) over a long growing season. There is a strong relationship between the total costs of production and the proportion of grass in the dairy cow's diet (Dillon *et al*., 2005). The relationship shows that the average cost of milk production is reduced by 1 cent/litre for a 2.5% increase in grazed grass in the cow's diet. A similar relationship can be envisaged for beef production.

In recent years grazing management strategies have been identified to increase the proportion of grazed grass and reduce the dependency on indoor feeding in Irish systems of milk and meat production. Lengthening the grazing season by 27 days has been shown to reduce the cost of milk production by 1 cent/litre. Continued technical innovation in grazing management will further reduce the cost of milk and meat production and therefore underpin the viability of these industries. The efficiency of grass utilization on average Irish dairy and beef farms is relatively low and can be improved significantly through increased stocking rate (SR), adopting new grass varieties and applying modern grazing management technologies.

Table 1 shows the relative cost of grazed grass, grass silage, maize silage, rolled barley and kale on a DM basis (with and without land costs) and on a UFL basis at

land rental charges of €250, €350 and €450/ha. Costs were calculated using a range of stocking rates and corresponding herbage production: 2.5 livestock units (LU)/ha and 13.5 t DM/ha grown; 2 LU/ha and 12.2 t DM/ha grown and 1.65 LU/ha and 10.3 t DM/ha grown. Different levels of utilisation were also factored into the scenarios. A scenario with perennial ryegrass (PRG) and white clover (WC) at 2 LU/ha was also considered. Using a land rental charge of €350/ha, first cut grass silage is 3.15 times more expensive than grazed grass, second cut silage 3.18 and rolled barley at €240/ton is 3.55 times more expensive. Maize silage had a slightly lower cost than first cut silage. In addition the results show that grazed grass is the lowest cost feed, and therefore should be the base feed for ruminants in Ireland. The relative competitive advantage of grazed grass is expected to increase over the next number of years due to higher concentrate price and grass silage costs. Conserved feed costs (both grass silage and maize) are expected to continue to increase relative to grazed grass due to increases in contractor charges associated with inflation in labour, energy and machinery costs.

Table 1. The relative cost of grass, silage, and kale and concentrate feed at a range of stocking rates, utilisation rates and land costs.

	PRG‡, 2.5LU/ha, 80% utilised	PRG, 2LU/ha, 75% utilised	PRG + WC†, 2LU/ha, 75% utilised	PRG 1.65LU/ ha 60% utilised	First cut silage 6.0 t DM/ha	Second cut silage 4t DM/ha	Maize silage No-plastic - 13t DM/ha	Purchased Rolled Barley €150/t	Purchased Rolled Barley €240/t
Total costs (€/t UDM*)	65	67	63	87	177	173	148	188	300
No land cost ((€/t UDM)	42	40	31	47	156	150	126	-	-
€/1000 UFL	64	65	62	90	219	221	189	162	259
Relative to grass total cost UFL	1.00	1.02	0.97	1.41	3.42	3.45	2.95	2.53	4.05
Total costs (€/t UDM)	75	78	75	104	185	182	157	188	300
No land cost ((€/t UDM)	42	40	31	47	156	150	126		-
€/1000 UFL	73	76	74	107	230	232	200	162	259
Relative to grass total cost UFL	1.00	1.04	1.01	1.47	3.15	3.18	2.74	2.22	3.55
Total costs (€/t UDM)	84	89	88	120	194	192	166	188	300
No land cost ((€/t UDM)	42	40	31	47	156	150	126		-
€/1000 UFL	82	87	86	124	240	244	212	162	259
Relative to grass total cost UFL	1.00	1.06	1.05	1.51	2.93	2.98	2.59	1.98	3.16

‡PRG – Perennial ryegrass *UDM – Utilisable Dry Matter †WC – White Clover Source: Finneran and Crossan (2010)

How can the potential of grass be harnessed in beef systems?

In the future the main technical efficiency that can increase on beef farms is the conversion of grass into meat. While we have been used to direct payments in the past two decades, by 2015 we will almost certainly see a reduction in these payments and a move towards higher stocking rate beef systems, something which has been restricted by environment schemes, etc. in recent years.
There are two main areas where the real potential of grass can be harnessed on beef farms:
1. Increasing grass utilisation across the main grazing season
2. Increasing the perennial ryegrass content of swards and including white clover in swards

Increasing grass utilisation

Beef farms currently have low stocking rates, the top third National Farm Survey (NFS) cattle farms are stocked at 1.7 livestock units (LU)/ha with the top third of eProfit Monitor cattle farms stocked at 1.95 LU/ha, however nationally cattle farms are stocked at 1.1 LU/ha. Within these stocking rates there is considerable scope to increase the proportion of grass in the grazing animal's diet. While there are a variety of beef systems practised commercially, overall grass utilisation is low nationally at approximately 4.8 t DM/ha. To begin examining where grass utilisation can be increased the grazing season must be broken into the three main grazing periods - spring, summer and autumn.

Spring Grass Utilisation

Early spring grazing has beneficial effects on animal and sward performance. Turning animals out to grass early can substantially reduce the overall concentrate and grass silage feed budget. During the early grazing season (February – April) a balance must be found between feeding animals adequately to sustain high animal performance and conditioning the sward for the late spring/summer grazing season. Generally on beef farms this can be easily done as priority stock can be preferenced for first turnout.
The clearest path to increasing grass utilisation is to utilise spring grass efficiently. There are a number of key benefits to grazing animals in early spring:

- Reduced feed costs
- Reduced labour input
- Reduced slurry accumulation
- Increased animal performance

The key aspect of spring grazing management is to maintain a flexible approach; animals which are priority should be turned out to grass first in spring. A number of recent experiments have taken place with differing livestock showing the benefits of spring grazing. At Grange in 2010, a study compared the effect of early turnout of spring calved suckler cows and their calves with a comparative group retained indoors. The study took place from 1 March to 29 March. Table 2 shows the results. A number of performance increases were observed from the early turnout group - milk yield per cow of the grazing cows increased by 18%, and average daily gain (ADG) of the calves was increased by 22% during the study, and increased by 6% overall to weaning. The key opportunity afforded by earlier spring grazing was a saving of approximately €1.54/cow/day in feed costs and higher milk yield. The reduced requirement for slurry storage is not factored into this cost saving. Such efficiency, driven by a simple management practice, could be a key driver to increased production potential across beef farms.

Table 2. Effect of indoor feeding compared to full time grazing in spring from 1 to 29 March 29 on dry matter intake and performance of cows, and the weight gain of their calves

	Indoors full time	**Grazing fulltime**	**Difference**
Dry matter intake (kg)			
Grass	0	9.9	
Silage	9.2	0	
Concentrate	1.6	0	
Cow Milk Yield (kg)	7.0	8.7	+18%
Calf			
ADG during experiment(kg)	0.83	1.07	+22%
ADG to weaning (kg)	1.06	1.13	+6%

Source: Gould et al. (2011); ADG = average daily gain

An early grazing study carried out in Northern Ireland by Steen (2002) compared the performance of steers until slaughter from two spring turnout date (early and late) treatments. The early turnout group were turned out on 14 March and the late turnout group on 2 May. Between the two turnout dates steers indoors were offered grass silage *ad-lib*. For the early and late turnout treatments, daily live weight gains were 1.5 and 0.7 kg, daily carcass gains were 0.69 and 0.53 kg and final carcass weights were 370 and 347 kg, respectively (Table 3). The main conclusions from this study are that where possible maximum use should be made of grass in the diet of beef cattle. The carcass weight increase of 6% is a large response to early grazing and has the effect of increasing selling price by close to €50/head, not withstanding the lower feeding costs of the grazing system.

Table 3. The of early and late turnout dates on performance of finishing steers.

	Early Turnout	**Late Turnout**	**Difference**
Initial live weight (kg)	524	525	
Live weight gain (kg)	0.97	0.77	+0.20
Carcass gain (kg)	0.69	0.53	+0.16
Carcass weight (kg)	370	347	+13

Source: Steen (2002)

Mid Season Grazing Management

During the main grazing season the objective is to achieve animal performance from an all grass diet and ensure that ADG is close to or in excess of 1 kg/day. From late April onwards grass turns from vegetative (leafy) to reproductive (stemmy). This is a major management issue for grassland farmers. For each 1-unit increase in organic matter digestibility (OMD), grass dry matter intake (GDMI) is increased by 0.20 kg. Increasing herbage allowance results in small increases in GDMI. The aim must be to increase the quality of the grass allocated rather than the quantity offered; this is achieved by ensuring there is a high quantity of leaf in the sward. Table 4 shows the chemical composition of grass in a well managed situation across the grazing season. It is clear from this data that the nutritive value of grass can be sustained at a high level with good grassland management. The key during the grazing season is to maintain grass quality while offering the target herbage allowance. The move to grazing lower grass covers of 1200-1600 kg DM/ha, while maintaining a rotation length of between 17-21 days has helped the pursuit of increased grass quality in the

May to July period. During the mid-season, when a plant starts to head it produces a reproductive stem. This changes the balance of the plant from producing green leaf to producing high stem proportions. Green leaf content is directly related to grass digestibility. A 5.5% change in leaf content is equal to a 1-unit change in digestibility. Poorly managed swards can result in large reductions in green leaf content to just 50% leaf during the reproductive period. Well grazed swards (4.5 – 5 cm post-grazing sward height) will contain a high proportion of leaf in the mid grazing horizon (4 - 10 cm). This is the grazing horizon which has greatest influence on the GDMI achieved by the beef animal. Beef farmers must adopt a policy of offering swards with high leaf content throughout the season.

Table 4. Chemical composition of grass (>4 cm) across the grazing season from March to November

	March	**April**	**May**	**June**	**July**	**Aug.**	**Sept.**	**Oct./Nov.**
g/kg								
Dry matter	179	182	184	182	177	191	165	137
Crude Protein	223	222	166	176	169	189	203	228
Neutral detergent fibre	360	400	403	423	425	464	427	460
Organic matter digestibility	838	830	832	816	799	763	794	793

All swards 90-100% perennial ryegrass pasture (late heading cultivars)
Mid season grazing rotations 17-21 days (April – July); August - September (24 - 30 days); October/November (30days+)

Main season grazing management can be difficult when stocking rates are low on farms and the easiest way of rectifying this is to increase the carrying capacity of the farm with extra stock. The tendency on all livestock farms is to graze high pre-grazing yields throughout the main grazing season and this is not the correct way forward to ensure high performance.

In the last two years the adoption of the wedge based technology (this will be discussed in Pearse Kelly's paper), whereby the target pre-grazing herbage mass is set at 1200-1600 kg DM/ha, has been adopted on dairy farms and should be used also in beef farm grazing management. A recent study at Teagasc Moorepark has shown that adopting a strategy of grazing very low grazing covers (<1000 kg DM/ha)

is not the best way forward for mid-season grazing management. The study examined the effect of herbage mass (HM) on milk production, GDMI and grazing behaviour of spring calved dairy cows across the grazing season (April to November). Cows were offered one of three levels of HM: High HM (2300 kg DM/ha); Medium HM (1500 kg DM/ha) or Low HM (900kg DM/ha). Each herd grazed their respective farmlets separately throughout the study. The experimental period was divided in two periods from (April to end of July and end of July to mid-October). Mean pre-grazing yields (kg DM/ha) during the study for the High, Medium and Low HM treatments were 2330, 1521 and 978, respectively. Pre-grazing sward heights were 11.8, 8.8 and 6.9 cm for High, Medium and Low HM treatments, respectively, and post-grazing sward heights were, 4.3, 4.2 and 4.0 cm for High, Medium and Low HM treatments, respectively. There were no differences in milk production between treatments in the April to July period of the study. During the latter half of the grazing season offering higher HM (2300 kg DM/ha) reduced dairy cow performance. Animals offered lower HM swards (<1000 kg DM/ha) had to graze for 90 minutes longer to achieve 95% of the GDMI of the other herds. Allocating grazing cows swards of approximately 1500 kg DM/ha strikes the correct balance between animal and grazing management efficiency. A previous study showed that when the policy of continually targeting lower pre-grazing herbage masses is adopted, then it is possible to run into grass deficits across the grazing season.

The mid-season grazing policy should be to target pre-grazing herbage mass of approximately 1200-1600 kg DM/ha, maintain a rotation of between 17-21 days, ensure the farms is walked weekly and that surpluses and deficits of grass supply are identified and corrective action is taking before problems occur.

Autumn Grazing Management

As in spring, the focus of autumn grazing management is to increase days at grass and increase animal performance, but also to set the farm up on the final rotation to grow grass over winter and provide grass the following spring. There are two key periods in autumn: (i) the period of autumn grass build up and (ii) managing the final rotation. Generally rotation length should be extended from 10 August. The focus of this period is to gradually build pre-grazing herbage mass, targeting covers of 2000-2300 kg DM/ha in mid-September. Pre-gazing covers >2500 kg DM/ha are difficult to utilise and should be harvested as surplus (round bales). Removing paddocks after the first week of September should be avoided if possible. Such paddocks have only

one rotation left for grazing at that stage, removing these paddocks in September is too late as paddocks do not have enough time to regrow to make any meaningful contribution in the last rotation. Surplus paddocks should be removed in August. Such decisions can be easily made if the farm cover targets are achieved at the right time, many farmers fall into the trap of building cover too late and are pushed into harvesting excess grass in September.

The feeding value of autumn grass is not as high as that of spring grass, though differences in terms of animal production are not always large (Marsh, 1975). At the same stage of growth and equal digestibility, the net energy value of autumn grass is often lower than that of spring grass (McDonald *et al.*, 1998). Spring grass containing 11 MJ ME / kg DM supplies 5.2 MJ net energy / kg DM for fattening cattle compared to 4.3 MJ net energy / kg DM for later grown grass at the same metabolisable energy (McDonald *et al.*, 1998). However, in some cases the introduction of concentrate to finishing cattle is required because pasture quality is poor due to previous grazing management. Good grazing management in mid-season will allow heavier covers to be accumulated for autumn, without having a detrimental effect on sward quality.

<u>Key points for autumn grazing management</u>

- Build rotation length from 10 August, increasing rotation length from 28 days to 35 days in mid-September.
- Highest farm cover should be achieved in mid to late September.
- The first paddock required for spring grazing should be closed on 10 October, in slower grass growing regions closing may begin earlier. 60% of the herbage available for grazing next spring will be the grown once these paddocks have been closed.
- Each 1 day delay in closing from 10 October to 11 December reduces spring herbage mass by 15 kg DM/ha/day
- Have at least 60% of the farm closed by the end of the first week of November.
- All paddocks should be grazed to a post-grazing height of 4 cm during the last rotation to encourage winter tillering.

2. Increasing the perennial ryegrass content of swards and including white clover in swards

As previously mentioned grass utilised/ha is one of the main factors influencing profit/ha on dairy and beef farms. Grass utilised/ha is a consequence of grass grown/ha, stocking rate and grassland management. Nationally dairy farmers operate at a stocking rate of 1.78 LU/ha (O'Donnell *et al*., 2008) on the grazing area. It is estimated that approximately 7.5 t DM/ha are utilised based on energy demand, concentrate fed, grazing season length and the feed value of grazed grass, grass silage and concentrate. Table 5 shows the total and range in herbage production for a group of 17 farms across a range of different soil types in 2009 in the Munster region (south of Ireland). The overall grazing stocking rate is high at 2.6 LU/ha. There is a large variation in grass DM production across the farms. Average herbage production was 11 t DM/ha and ranged from 9.2 to 14.4 t DM/ha, while individual paddock yields ranged from 6.3 to 17.0 t DM/ha within and across farms. A large proportion of farms were producing less than 11 t grass DM/ha annually.

Table 5. Mean and range of grass DM production on 17 dairy farms in Ireland in 2009

Farm location and soil type	Average DM production	Top 20% of paddocks	Bottom 20% of paddocks	Stocking rate (cows/ha)
Tipperary (Free draining)	14.4	17.0	9.5	3.0
Limerick (Heavy soil type)	13.4	14.5	11.4	3.1
Tipperary (Free draining)	12.8	14.3	10.1	2.5
North Cork (Free draining)	12.4	14.6	10.6	2.9
Tipperary (Heavy soil type)	11.9	15.0	8.0	2.2
North Cork (Free draining)	11.7	14.5	8.3	2.5
North Cork (Heavy soil type)	11.0	13.5	7.1	2.7
North Cork (Free draining)	11.0	13.2	8.5	2.1
North Cork (Free draining)	11.0	12.9	8.5	3.1
North Cork (Free draining)	10.9	13.2	8.4	2.6
Tipperary (Heavy soil type)	10.2	13.3	7.5	2.2
North Cork (Free draining)	9.9	13.3	6.3	2.7
Tipperary (Free draining)	9.6	11.7	7.5	2.5
North Cork (Free draining)	9.4	12.8	7.2	3.3
North Cork (Heavy soil type)	9.3	11.5	6.0	2.0
North Cork (Heavy soil type)	9.2	11.9	7.7	2.2
North Cork (50% Heavy, 50% Free draining)	9.2	11.0	6.3	2.7
Average Farm DM production	**11.0**	**13.4**	**8.2**	**2.60**

Source: Shalloo et al. (2010)

Perennial ryegrass is a high quality feed and is more responsive to available nutrients than other grass species. Recent research at Teagasc Moorepark has shown old permanent pasture to produce, on average, 3 t DM/ha less than reseeded perennial ryegrass swards. Figure 1 shows the DM contribution across the grazing season of a 15% perennial ryegrass sward compared to a 100% perennial ryegrass sward. The majority of the difference in DM yield between the two swards is accounted for during the February to mid-May period. Swards with low levels of perennial ryegrass are less nutrient efficient, approximately 25%, than swards with high levels of perennial ryegrass. We have a poor reseeding history in this country with only 1-2% of grassland reseeded. The comparison of both swards is very stark

in that the carrying capacity is about 1 LU/ha less on the 15% perennial ryegrass sward compared to the 100% perennial ryegrass sward.

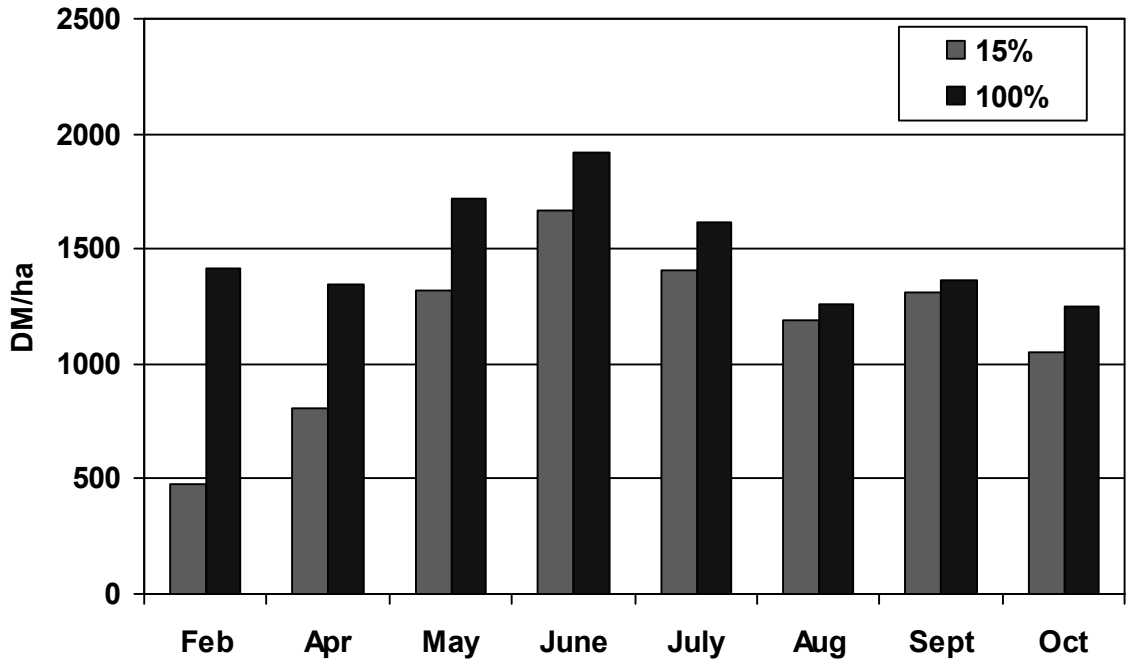


Figure 1. Dry matter production from February to October of a sward containing 15% perennial ryegrass and one containing 100% perennial ryegrass.

Clover inclusion can increase animal performance at pasture

Approximately 85,000 farmers have an organic nitrogen (N) stocking rate of <100 kg N/ha. White clover (*Trifolium repens*) is the most important legume in grazed pastures in temperate regions. It grows very well in association with grasses and is tolerant of grazing (Whitehead, 1995). It also grows over a fairly wide range of climatic conditions and its herbage has a high nutritional quality for livestock (Whitehead, 1995). White clover fixes atmospheric N through a symbiotic relationship with rhizobia in its stolons. Most estimates of N fixation by white clover suggest that 50-200 kg/N/ha/annum may be fixed. These fixation values are at least equivalent to the fertiliser N usage on grassland on many beef farms. Clover is generally considered to be nutritionally beneficial to ruminant diets. Seasonality of clover production, variation from year to year and lack of persistency have limited the attractiveness of white clover for inclusion in grassland farms. In recent years this has been overcome with the introduction of white clover varieties with high seasonality of production and middle leafed growth habit. In a recent survey of

grassland farmers, beef farmers were asked what level of clover inclusion did they have when swards were reseeded, 32% of respondents said none, 40% said <10% and 20% did not know. There is a major opportunity to reduce costs being missed on beef farms by not including white clover in the grazing swards.

In recent years Teagasc Grange have completed a number of studies evaluating the contribution of white clover to beef production. In one study four areas of old pasture were identified, half of each was ploughed and reseeded with a perennial ryegrass (*Lolium perenne*; cv. Green Isle) and white clover *(Trifolium repens*; cv. Susi) mixture, and the remainder was strip seeded with white clover. Three grazing treatments were imposed on each pasture type: Treatments A, B and C on old pasture represented an animal stocking rate in spring of 3000, 2500 and 2000 kg live weight/ha, respectively; Treatments D, E and F represented the corresponding stocking rates on reseeded swards. An application of 50 kg N/ha was applied to all swards in early spring each year. While treatments B, C, E and F received no further N fertilizer, Treatment A and D received approximately 35 kg N/ha after each grazing cycle (giving a total input of 220 kg N/ha). Fifteen Charolais crossbred steers (mean initial live weight of 570 kg and 564 kg in Year 1 and Year 2, respectively), were used per treatment. Cattle moved to a new paddock when the control treatment (A on old and D on reseeded pasture) was grazed to a residual stubble height of 5 cm.

Herbage production data for the Year 1 and 2 grazing season (early-April until mid-November) are shown in Table 6. Herbage production ranged from 7540 to 10,469 kg DM/ha and from 6360 to 11,606 kg DM/ha in Year 1 and 2, respectively. Reseeded pastures had the highest yields. The greatest difference was observed on the N fertilised treatments. Sward clover content was 20 to 25% in the low N treatments (B, C, E and F) in Year 1, but were only half of these values in Year 2.

Animal live weight gains from turn-out to pasture (early April) until late-August (date of first draft for sale) were 0.91 and 1.1 kg/head/day in Year 1 and Year 2, respectively. Heavier carcass weights were produced from the reseeded swards (B vs E; C vs F). The clover treatments E and F had higher carcass weights than the fertilised control (Treatment D). At slaughter, in Year 2, laxly grazed animals had higher live weight than those on the N treated swards. Heavier carcass weights were again produced on the reseeded swards, with an 18 kg carcass difference between old (A) and reseeded (D) pastures. Within pasture type, clover treatments (B and C, and E and F) resulted in similar carcass weights, thus showing that there was no

difference in live weights between the lower stocking rates. Within pasture type there were differences between clover pastures, and animals on the reseeded swards had higher kill-out proportions in Year 2.

Table 6. Effect of pasture type, stocking rate and nitrogen usage on dry matter (DM) production, sward clover content (%) and animal performance

		Old Pasture			Reseed Swards		
	Year	**A**	**B**	**C**	**D**	**E**	**F**
N input (kg N/ha)		220	50	50	220	50	50
Spring stocking rate (kg live weight/ha)		3000	2500	2000	3000	2500	2000
Dry matter yield (kg DM/ha)	1	8615	7540	7809	10469	9160	8235
	2	7674	7246	6360	11606	9007	9806
Mean sward clover content (%)	1	1	20	22	13	21	25
	2	2	10	10	6	16	17
Final Live weight (kg)	1	728	730	743	722	741	741
	2	703	718	727	698	709	718
Carcass weight (kg)	1	383	387	390	386	402	405
	2	364	382	381	382	386	387

Current reseeding rates in Ireland

There is currently a low rate of reseeding practised in Ireland (Creighton, unpublished). For many livestock farmers the initiation of a grassland reseeding program is one of the key changes required to improve the performance and profitability of the livestock production enterprise. The total amount of reseeding in Ireland is low with about 2% of the agricultural area (c. 140,000 ha) being reseeded annually. Given our low stocking rate and poor performance nationally per ruminant animal and per hectare it appears that the quality of grass swards on-farm is often substandard. In order to improve our ability to grow grass, further increases in the amount of pastures being reseeded is required. Devaney *et al.* (2000) found that total tiller density ranged from (10,000 to 14,500 tillers) but perennial ryegrass content was on average just 55% in the swards of eleven beef farms. Generally, when tiller density is so high in swards the perennial ryegrass content tends to diminish.

Summary

The permanent variability in market forces continuously impacts on the relatively short term management practises employed by farmers. All current indications are that any competitive advantage for Irish beef production in the coming decades will depend on increased and more efficient utilisation of grass for the sustainable production of high quality meat. In particular, the proportion of annual feed intake contributed by grazed herbage will have to increase to the highest amount practical. This will require the widespread adoption of best practise grassland and grazing management techniques. A stronger focus on increasing grass utilisation throughout the grazing season will need to take place on beef farms, the key periods to increase grass utilisation are in early spring and late autumn. The beef industry has huge potential to deliver a substantial increase in grass utilisation. Existing grass swards on beef farms, as on dairy farms, may not be able to supply herbage when it is required. Central to this on many farms will be introduction of improved varieties of grass and of optimal mixtures of perennial ryegrasses and white clovers, via reseeding of existing pastures.

References

Finneran, E. and Crosson, P. 2010. Cost of feedstuffs to ruminants, Teagasc Grange, Teagasc internal document.

Gould, N. Minchin, W. Kenny, D. Fahey, A and McGee, M. (2011). Effect of initial grazing date in spring, via restricted or full time grazing on intake and performance of primiparous beef suckler cows and their progeny. Agricultural research forum, 2011. pp154.

Devaney, S. O' Riordan, E and Caffrey, P (2000). Herbage supply and quality and animal performance on drystock farms. IGAPA forum, pp105.

Kelly, P. (2011) Teagasc Beef conference, Kilkenny, in these proceedings

Marsh, R. (1975) A comparison between spring and autumn pasture for beef cattle at equal grazing pressures. *Journal of the British Grassland Society*, 30: 165-170.

McDonald, P., Edwards, R.A., Greenhalgh, J.F.D. and Morgan, C.A. (1998) Chapter 18. Grass and forage crops. In: *Animal Nutrition.* Fifth Edition. Longman Group Ltd.

O'Donnell S., Shalloo L., Butler A.M. and Horan B. 2008. Opportunities, challenges and limitations on Irish Dairy farms. *International Journal of Farm Management*. 13: 419-434

Steen (2002). Effects on performance and carcass composition of turning beef cattle out to pasture early in spring. Grass and Forage Science, 57, 401-404.

Shalloo, L. Creighton, P and O'Donovan, M (2010). Reseeding! A cost or an opportunity. In proceeding of 'Grasses for the future conference, Cork. pp139-153.

Whitehead, D.C. 1995. Grassland Nitrogen. CAB International, Wallingford, UK. 397 pages.

Management Tools to Increase Grass Utilisation on Beef Farms

Pearse Kelly, Teagasc Cattle Specialist, Teagasc Kildalton

Summary

- Beef farms need a rotational grazing system if they are to use the best tools available to them for proper grass utilisation.
- Adequate soil fertility and reseeding of low perennial ryegrass swards are essential components in setting the farm up to grow the maximum amount of grass during the year.
- In the autumn, start closing paddocks in early October with 60% of the farm closed by the 10th November. With a consistent area closed each week a cover of grass can be saved up for grazing early the following spring.
- The Spring Rotation Planner should be used for the first grazing in the spring with a long first rotation planned to end with 100% of the farm grazed by early to mid-April.
- The target pre-grazing covers on beef farms during the main grazing season should be 1,200-1,600 kg DM per ha (9 cm).
- Swards must be grazed to 3.5 to 4 cm for the first grazing rotations and down to 4 to 5 cm during the main grazing period if the feeding value of grass is to be maintained throughout the year.
- The best economical use of cattle slurry is in spring, when weather conditions allow the best nitrogen utilisation possible. Significant savings can be made purchased N fertiliser for both early grazing and first cut silage, where this is done.
- Only apply bagged nitrogen for early grass on swards that have medium covers of grass and only when soil temperatures rise above 5-6^{o}C.
- By using the **Grass Wedge** management tool it is easier to identify when surpluses or deficits of grass are likely to occur. Action can be taken much sooner to avoid these surpluses and deficits.

Introduction

Increasing the amount of grass grown and utilised on beef farms is one of the key drivers towards increasing profit margins per hectare from beef production on Irish farms. Extending the numbers of days in the year that cattle are at grass, controlled grazing systems, optimum soil fertility and making best use of both slurry and nitrogen fertiliser all play a part in achieving this goal. There are now also a number of other management tools which are being successfully employed on beef farms that are resulting in significant gains in the quantity of grass grown and grass utilised. This is allowing for increased stocking rates and hence increased output at very little extra annual costs. This paper outlines what these tools are and how they are used.

Setting up the farm

If a grass farm is to be run to its full potential it needs to be given every possible advantage. There are a number of priority infrastructural areas that must first be addressed if the benefit of other grassland management tools can be fully utilised on a beef farm.

(i) A Rotational Grazing System

It has clearly been shown that a rotational grazing system offers increased control of grass as it allows more options when closing up in the autumn and turning out in the spring. It also gives the farmer the ability to react quicker to impending surpluses or deficits, compared to set stocking during the main growing period. Each grazing group needs a minimum of six to eight grazing divisions to rotate around. This can be achieved on most beef farms by a combination of dividing up larger fields with permanent fencing, reducing the numbers of groups grazing on the farm and using temporary flexible electric fencing, especially in the spring and autumn to allow further control of grass.

(ii) Proper Water Supply

Many beef farms have an inadequate number of water points throughout their farm. Increasing the number of water points available increases the number of grazing options available. By putting in extra permanent water troughs at strategic points throughout the farm it is possible to service a number of grazing divisions at the same time. Placing troughs across fences to service two paddocks or in the centre of large fields that are going to be temporarily divided later in the year allows at least four different divisions to be serviced. Small movable water troughs can also be very

useful when they are attached to a long length of piping which is attached to the inlet piping on existing permanent troughs. These movable troughs can supply water to paddocks that are being strip grazed with a front and back electric fence.

(iii) Maintain Adequate Soil Fertility

Perennial ryegrass and clover grow best in soils that are not deficient in either P or K and have an adequate soil pH. To get the most from grass swards soil needs to be tested regularly and the results acted on. Test every three years on heavily stocked farms and every five years with lower stocking rates. Research over the years has shown the response to nitrogen fertiliser to be up to 30% lower when soil pH is too low. Therefore, lime is just as important. Target the slurry on those fields that need P and K most. This is often the silage fields.

(iv) Planned Reseeding Programme

Many pastures have medium to low proportions of perennial ryegrass. Because of this, winter and spring growth is often very poor and the quality of grass during the main growing season can also be reduced, especially, if there are a lot of weed grasses present. Maximum growth throughout the year will only be achieved where there is a high percentage of perennial ryegrass in the sward. A planned reseeding programme where a proportion of the farm is reseeded every year can dramatically increase the quantity of grass produced and the quality of grass on a beef farm. This is often an essential first step if stocking rates are to be increased.

Where stocking rates are currently low on a farm, there is an opportunity to reseed a significant amount of the farm over a short space of time. With paddocks introduced and stocking rates increased on part of the farm, the resulting surplus land can be reseeded each year. As this reseeded land comes back into the grazing area, the stocking rate can be further increased allowing more land to be reseeded.

Closing in the Autumn

For all grassland farmers, the management calendar starts in the autumn each year. How the farm is grazed out in the months of October and November has a direct effect on how the farm will be grazed the following February and March. The plan must be to close up a consistent amount of the grazing area each week until the whole grazing area is closed so that by the following spring some of the farm will have considerably more grass than other parts, to allow early grazing. The first

fields/paddocks closed in the autumn should the ones that will be grazed first in the spring.

The ***60:40 Autumn Planner*** is the tool now being used by progressive beef farmers to plan out the last grazing rotation in the autumn. With this planner these farmers aim to start closing up paddocks from early October and to have 60% of the whole farm closed by the 10th November. The remaining 40% is closed up between then and housing. A consistent amount is closed each week until the 60% is achieved. Therefore over a five week period, 12% of the farm would be closed every seven days. By the time all of the stock are housed for the winter, the farm should have an adequate cover of grass going into the winter. A target average cover at closing for the whole farm is 500 – 600 kg DM per ha (approximately 6 cm in height). The paddocks closed first might be expected to have 800 – 900 kg with the last closed paddocks having covers of 200 – 300 kg.

By having a set area of the farm to graze each week it helps to make decisions on whether the last rotation is being grazed too fast or too slow, especially in October and early November. If too little is being grazed it needs to be speeded up. This can mean leaving out some stock longer than was intended or grazing some lighter covers before heavier covers. If it is being grazed too fast the extra stock need to be housed.

Spring Rotation Planner

How the first round of grazing is completed in the spring can have a direct effect on the next two to three grazing rotations so it is critical that it is managed properly. Where turnout is too late all of the silage ground may not be grazed before closing, grass growth can be poor until the end of April as old brown dead grass hinders new leaf growth and surpluses of grass can very quickly build up especially on the last paddocks to be grazed in the spring. This leads to poor quality grass in the diet of the beef animal at the time of year when quality should be at its best. Where surplus grass is taken out in April, it can often lead to a very short second grazing rotation which may lead to a deficit of grass, if growth rates are poor.

When turnout is too early or the first round of grazing is completed too quickly there can be a huge shortage of grass available for the second rotation and this may lead to cattle having to be re-housed or silage ground grazed again leading to a very late first cut of silage.

To avoid both these scenarios the ***Spring Rotation Planner*** is the grassland management tool that should be used by more beef farmers. Like the 60:40 Autumn Planner it is based on grazing a set area of the farm each week until all of it is grazed. On dry early farms, the plan is for the first round of grazing to last 50 to 60 days, starting in early to mid-February and ending in early to mid-April. On wetter, later farms a 50 day first rotation starting and ending slightly later should be aimed for.

By having such a long first rotation (50-60 days) the paddocks grazed first in Spring (those that were closed first in the autumn) will have adequate rest time to have enough re-growth when the second rotation begins in April. Some grazing paddocks should be grazed before the silage ground is grazed as these will be the first to be grazed in the next rotation, otherwise there would not be enough of a rest period between grazings for these.

As a general rule of thumb, beef farms with a reasonable amount of dry land should aim to have 30% of the farm grazed by the 1st March, 60% grazed by the 20th March and the remaining 40% grazed by the 10th April. The number and type of stock turned out at different stages will drive the daily and weekly demand for grass. Even if grass covers are lower than preferred, this plan should still be followed as it is setting up the farm to have a wedge of grass by the time the second rotation begins. Where the target area to be grazed by a certain date is not being achieved more stock need to be turned out. If the target is being exceeded, grazing needs to be slowed down. This may involve feeding some silage at grass, if conditions allow, re-house some stock or delay your planned turnout date for other stock.

Pre- and Post-Grazing Heights

To achieve maximum weight gain in beef cattle and milk production in suckler cows the objective must be to supply them at all times with a constant supply of leafy grass that is highly digestible and energy and low in stem and fibre. The higher the covers that cattle graze each rotation the more grass that is left behind as the year progresses and the more stem that builds up in the sward which leads to lower weight gains. Grazing very low covers to an extremely tight post grazing height has a negative effect though on annual yield of grass and should also be avoided.

Recent research work at Teagasc Grange has shown it to also have a negative affect on animal performance at grass.

In the first rotation, it is still important to graze swards to 3.5 to 4 cm to remove all old dead material that has built up over the winter and to allow light down to the base of the grass plant as this encourages tillering and a thickening of the sward, especially in the spring. Perennial ryegrass competes better with many of the less desirable grass varieties in a sward under tight grazing conditions and this is another good reason to clean out paddocks well.

The covers of grass that cattle are to graze should be 1,200-1,600 kg DM per ha (9 cm in height), if swards are to be grazed out correctly. Paddocks with higher covers than this should be considered for cutting immediately as baled silage, particularly if there is enough grass on the rest of the farm. On lowly stocked farms the pre-grazing cover should be less at 1,200 to 1300 kg DM per ha. As the grazing season progresses towards the autumn, slightly higher covers will have to be built up (1,800 kg DM per ha or greater) if a bank of grass is to be accumulated before growth rates decline in September. This bank of grass is important so that stock can graze for longer in the autumn.

During the main growing season, by grazing lower grass covers than most beef farmers are used to grazing, the post grazing sward heights can be kept tight at 4–5 cm. If large numbers of surplus bales are constantly being taken off the grazing area this is a clear indication that stocking rates on the farm are too low. Little or no topping should be needed with this type of grazing regime.

Slurry and Nitrogen

Cattle slurry contains nitrogen, phosphorous and potassium with the latter two by far the most valuable part of it (typically 85–90%). The time of the year that it is spread has no effect on the availability of the P and K. The same is not true of the N. The N in cattle slurry is in two forms: 50% is in organic form which is not available to the grass to use immediately and the other 50% is ammonium. This latter half of the slurry can replace purchased bagged N, especially early in the spring. Similar to urea fertiliser, there are times of the year that you can expect to get the maximum value of N from slurry and this is very much weather dependent. The ideal conditions for getting the best nitrogen utilisation from cattle slurry are:-

- Overcast with very little sunshine
- Slight drizzle of rain
- Little or no wind

Where the weather conditions are only average there is a 50% loss in utilisation rate and where the conditions are poor i.e. a sunny, dry day with a strong breeze/wind there is a further 50% loss in utilisation rate.

Cattle slurry spread at 2,500 – 3,000 gallons per acre in the right conditions in early spring is equivalent to spreading ½ a bag of urea per acre. Paddocks or fields with low covers of grass (< 6cm) should get slurry as should the paddocks that have the heaviest covers, as soon as they are grazed out. Medium covers of grass (6–8 cm) should get bagged nitrogen (approximately 25 units per acre) when soil temperatures rise above 5–6^{o}C, as applying it before this can often lead to a very poor response.

Where a trailing shoe slurry spreader is used heavier covers of grass can get slurry compared to the splash plate spreaders. Recent research at Teagasc Johnstown Castle has also shown better N utilisation when the trailing shoe is used. This equates to an extra 4 units of N per 1,000 gallons spread. The extra cost of the trailing shoe over conventional spreading methods though may outweigh the value of this extra N.

Silage fields should also get slurry where it is available at closing up in the spring. Applying 2,500 gallons per acre can reduce the requirement of bagged N to less than 70 units per acre on older permanent pasture destined for first cut silage. On fields than have been reseeded in the last four years it may be worth applying a further 20 units of bagged N per acre as these swards have the potential to produce higher quantities of grass with adequate N.

The Grass Wedge

During the main grazing season the two objectives must be to:-

1. Provide a constant supply of grass to grazing animals
2. Keep the quality of the grass on offer at its highest

Both these objectives are interlinked. Where there is too much grass available the quality deteriorates rapidly or alternatively if you try to constantly graze very low covers to maintain quality you can quickly run out of grass. The ***Grass Wedge*** is the latest tool that is available for use by beef farms to avoid both these situations and more importantly to recognise in advance when one or the other is likely to happen in the coming weeks.

The grass wedge requires that the farm is walked weekly and recording an estimate on the cover of grass that is available for grazing in each paddock. This can be done using a plate-meter, using the cutting and weighing method or by eyeballing swards and making an informed decision. Whichever method used is irrelevant, the most important point is that each paddock is walked and a figure recorded.

There are number of simple and easy to use grass computer programs that can be used to generate the grass wedge or it can be done manually on a sheet of paper just as quickly. The end result is the same. See below (**Figure 1**) a bar-chart with kg DM of grass per ha on the Y axis and the paddock numbers along the X axis. The paddock with the highest cover is first on the chart followed by the next highest and so on until the last bar is the paddock with the lowest cover. The demand line is the drawn in, which for most farms starts at 1,400 kg DM per ha on the left. This is the maximum cover of grass that should be grazed. This line drops to the ideal cover after grazing a paddock e.g. 200 kg DM per ha.

The wedge is now complete and ready for use. In an ideal situation the demand line matches exactly the covers of grass in the paddocks i.e. grazing the right covers and having enough grass but not too much coming along to be grazed over the next two to three weeks.

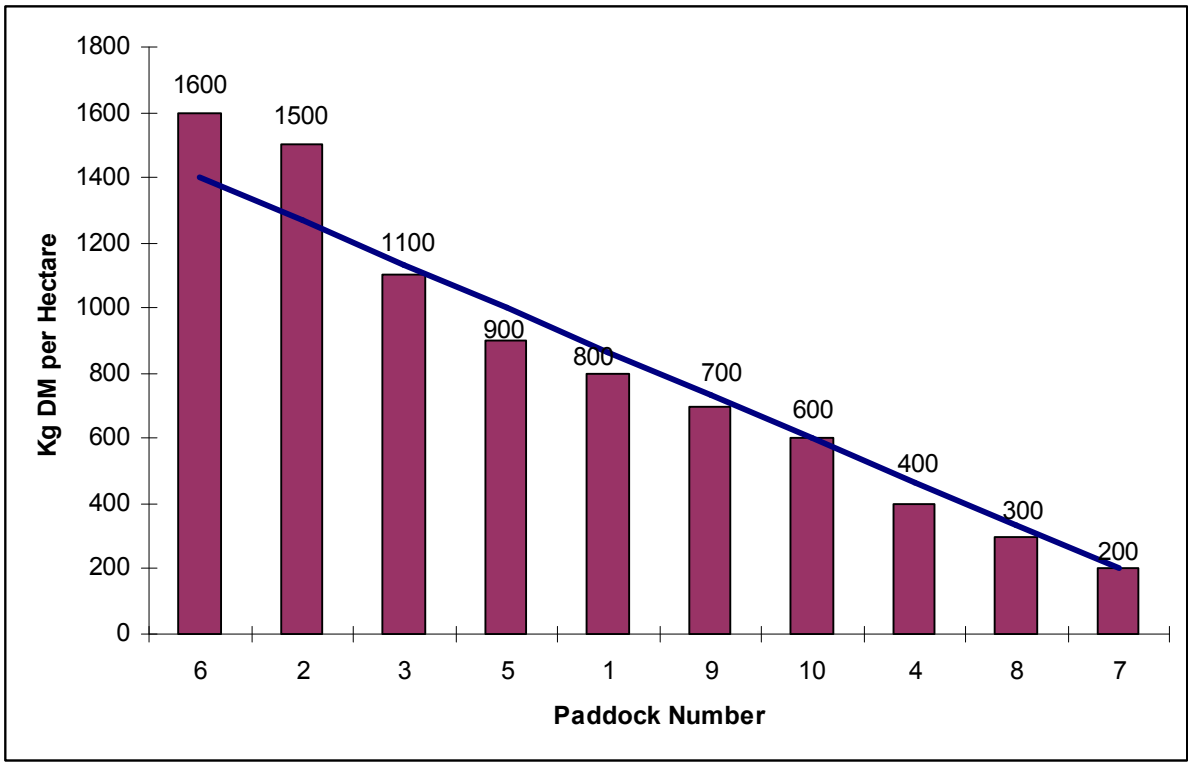


Figure 1. Example Grass Wedge

If there are a lot of bars above the demand line the farm will be in surplus and the farmer needs to consider taking some of the heavier cover paddocks out as surplus grass (see example in **Figure 2**). It is good practice to take these out as soon as possible to allow them to start growing grass again for the next rotation. While the quantities of bales made per hectare by doing this can be low the quality in these bales is exceptional due to the very high leaf content. It is also obvious from the wedge in Figure 2 that the target post-grazing heights are not being achieved and too much grass is being left behind. If this is not addressed quickly sward quality will deteriorate.

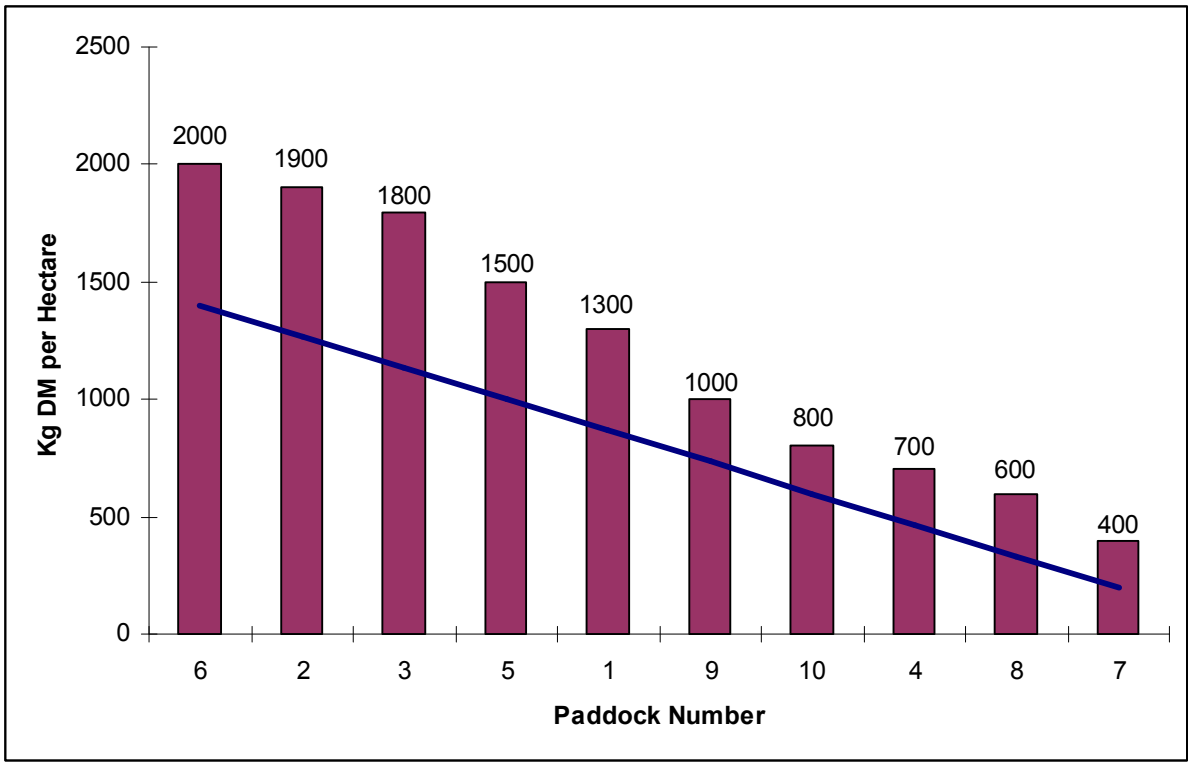


Figure 2. Example Grass Wedge in Surplus

If there are a lot of bars below the line there either is not or will not be in a short period of time enough grass to meet the target pre-grazing covers and there will be a deficit of grass on the farm to meet herd demand. **Figure 3** is a good example of this. While the paddocks the cattle are going in to graze next are on target there is a serious shortage of grass fast approaching that needs to be dealt with now i.e. the sooner action takes place to avoid it the less chance it will actually happen. The grass wedge allows you to see well in advance of when there is going to be either a surplus (and hence a quality problem) or a deficit of grass.

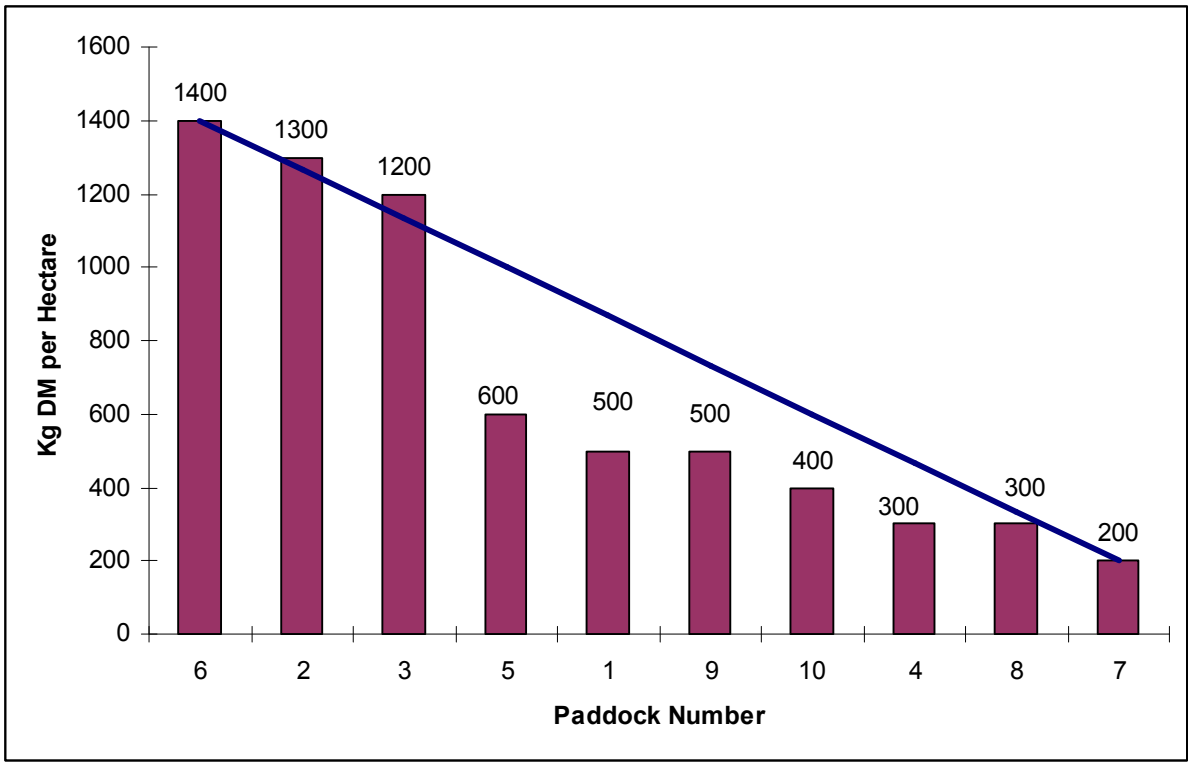


Figure 3. Example Grass wedge with a deficit approaching

Implications & Cost of BVD to the National Beef Herd

Dr. David Graham, Programme Manager, Animal Health Ireland

Bovine viral diarrhoea virus (BVDV) is the cause of a range of clinical disease signs that are commonly referred to as bovine viral diarrhoea or BVD. Cattle that have come in contact with the virus after birth will typically be infected with the virus for only a short period of time, because the animal's immune system responds to the infection and eliminates it. These animals are said to be briefly or transiently infected, and are sometimes referred to as TI animals. One part of this immune response is the production of virus-specific proteins (antibodies) 2-3 weeks after initial exposure which remain in the blood for life. These antibodies can be detected by diagnostic tests (ELISA), with a positive result indicating previous infection with BVDV.

One consequence of these transient infections is a temporary weakening of the animal's immune system, and during this time they are more susceptible to infections with other disease-causing agents. This can be a particular problem in calves and can present as increased levels of pneumonia and scour.
However, the single biggest impact of transient infection with BVDV is on reproduction. The precise outcome will depend on the exact stage in the reproductive cycle that exposure occurs.
For example, infection immediate prior to service, or during the first month following service, can result in a failure to conceive in the first instance or death of the embryo if conception occurs.

Persistently Infected (PI) Calves

However, the most important period of pregnancy in relation to exposure of BVDV is from around day 31 to day 120. One potential outcome if a dam gets exposed to BVDV for the first time during this period is abortion. If the unborn calf survives the infection and is successfully delivered at birth, it will be persistently infected (PI). Infection during the middle period of pregnancy (approximately 121-180 days) can again result in abortion or the birth of calves with a range of defects which particularly affect the nervous system and eyes. These can include blindness, cataracts, enlarged skull and lack of balance. In the last third of pregnancy (7^{th} to 9^{th} month) the immune system is usually sufficiently developed to fight off infection, resulting in the birth of a healthy calf. It should be noted that in all of these cases the dam will

undergo only a transient infection, changing from antibody negative to positive in the process.

The PI calves that are born as a result of exposure during day 31-120 of pregnancy contain high levels of virus. Essentially all outputs from these cattle such as saliva, mucus, faeces, urine, milk and semen contain virus and for this reason they are efficient transmitters of infection to other cattle they are in contact with. It should be emphasised again that these in-contact cattle undergo only transient infection- if an animal is not PI at birth it cannot become one subsequently.

The majority of PIs will die before they reach two years of age- some from a condition called mucosal disease that is characterised by sudden onset of scour, lameness and ulceration in the mouth and interdigital space.
However, the 10-20% that survive to breeding age will in turn produce PI calves, given that their calves cannot avoid exposure to the virus during the critical period of pregnancy between 31-120 days.

BVDV Prevalence and Cost

Available laboratory data indicates that there are very high levels of exposure to BVDV in the national herd (i.e. cattle that have been transiently infected). At the individual animal level, it is estimated that around 70% of cattle have been exposed and almost all herds in the country contain at least some of these cattle. It is interesting to note that the level of exposure now is similar to figures from the late 1980s, suggesting that while we may now be much more aware of BVD, it is by no means a new disease in Ireland. Estimates of the prevalence of PI animals are in the range of 0.6-1.2%, although these are not specific to the beef herd. It is hoped that outputs from the BETTER Farm Beef programme will shed more light on this, although the small number of herds involved will mean that the information will have to be interpreted with caution.

It is difficult to give absolute figures for the cost of BVDV in the national beef herd, but the level of exposure suggests that it is considerable. AHI is currently in the process of modelling costs for different sizes of suckler and dairy herds. In the meantime, perhaps the best data available is from work done in Scottish suckler herds. A study from 2004 found that the costs following introduction averaged 42 Euro per cow per year over a ten year period. The majority of these were due to reproductive losses and death of PI cattle. It should be emphasised that not all herds

will experience the same levels of loss. More recent studies have estimated that the loss of gross margin/cow relative to BVDV-free herds will vary from 12-23%, while infection was estimated to reduce the enterprise gross output by 3-35%. Vaccination may be considered another cost due to BVDV. Although the uptake is higher in the dairy sector, total sales of around 840,000 doses in 2009 highlight the aggregated year on year costs of this element of BVD control at farm level.

In addition to the costs at individual farm level, there are also actual or potential financial losses beyond the farm gate. In particular, the growing number of countries that have previously, or are currently, engaged in BVDV control at national level poses a risk to export markets for live cattle.

Eradication Initiatives

It is evident that control of PIs is a requirement for the successful control of BVD infection, either at the individual herd level or nationally. Across Europe, a number of countries have run successful national or regional programmes on this basis. These include Norway (free at national level since 2005); Sweden, Finland, Denmark and Austria, where successful programmes based on individual sampling (blood and milk) have run without vaccination. More recently, programmes in Switzerland (beginning in 2008) and Germany (regional approach from January 2010 [nationally from January 2011]) based on use of ear tissue samples have been shown to be effective, resulting in a reduction in the *percentage* of PI calves born from 1.5 to 0.1 and 0.75 to 0.35% respectively.

The success of the differing approaches taken elsewhere are an encouragement from the Irish national perspective, allowing the various approaches used to be considered for use here, while seeking to avoid the problems and pitfalls.

The industry and national animal disease experts have highlighted BVD as a priority to be addressed by Animal Health Ireland. While initial efforts focussed on raising awareness and providing information to address the problem at individual farm level, more recently it has run a consultation process to gather the views of the industry on the degree of support for a co-ordinated, industry-led programme to eradicate BVDV from the national herd. It is planned to establish an implementation group shortly to consider the responses to this consultation and to plan the next steps in this process.

While successful delivery of such a programme will present a number of challenges and will require all sectors of the industry to work together, it offers the possibility of

rapid progress toward a PI-free future that delivers increased cattle health and profitability.

Summary

In summary, BVD is an economically important disease, with persistently infected cattle being key to the maintenance and spread of infection. Other countries in Europe have shown that it can be successfully addressed at nation level, and the experience gained in these programmes offers Ireland the opportunity to consider options to eradicate BVDV within an agreed timescale. AHI has recently completed a consultation on an industry-led national programme, and this will form the basis for future plans.

Drawing up a Herd Health Plan for BVD and IBR

Ríona Sayers, CEO, IML Ltd., Enfield, Co. Meath.

Summary

- Non-regulated infectious diseases such as BVD and IBR are resulting in significant economic losses on Irish farms.
- The impact of such diseases can be reduced by implementing an on-farm health plan incorporating biosecurity, diagnostic testing and strategic vaccination.
- Greater awareness of infectious disease control amongst beef farmers and implementation of the combined approach of biosecurity, diagnostic testing and vaccination will lead to reduced national prevalence of these economically relevant infectious diseases.

Introduction

BVD (Bovine Viral Diarrhoea) and IBR (Infectious Bovine Rhinotracheitis) are viral diseases of cattle. They are relatively new diseases in Ireland, with initial reports of their existence dating back to the 1980's, early 1990's. Both diseases are highly infectious and cause significant economic loss on Irish farms. The prevalence of BVD and IBR in Ireland is unknown, although it is estimated that over 90% of Irish beef herds have been exposed to BVD virus. The prevalence of IBR is likely to be lower, but has been found to exist in an unacceptably high proportion of Irish dairy herds (Sayers et al., 2011). The impact of these diseases in terms of farm profit and animal welfare should not be underestimated. Control programmes for both diseases must be initiated in order to improve the health status of the national herd in Ireland, and to limit future on-farm losses. Introduction and implementation of on-farm health plans on Irish beef farms is now necessary in order to reduce the impact of infectious diseases such as BVD and IBR.

BVD

BVD is caused by bovine viral diarrhoea virus (BVDv). It is a highly contagious disease and direct animal contact is the most efficient method of BVD virus transmission. Two types of BVD infection exist:

- Transient viral infection (TI). This type of infection occurs when a previously unexposed healthy animal (naïve animal) becomes infected with BVD virus. This infection only lasts for a two week period (approximately) during which time the infected animal will shed virus and thus is a source of disease (see below). The majority of these transient infections do not result in clinical signs. On occasion, however, a severe transient infection (severe acute BVD) can prove fatal. Following a transient infection, an animal develops long-lasting immunity.

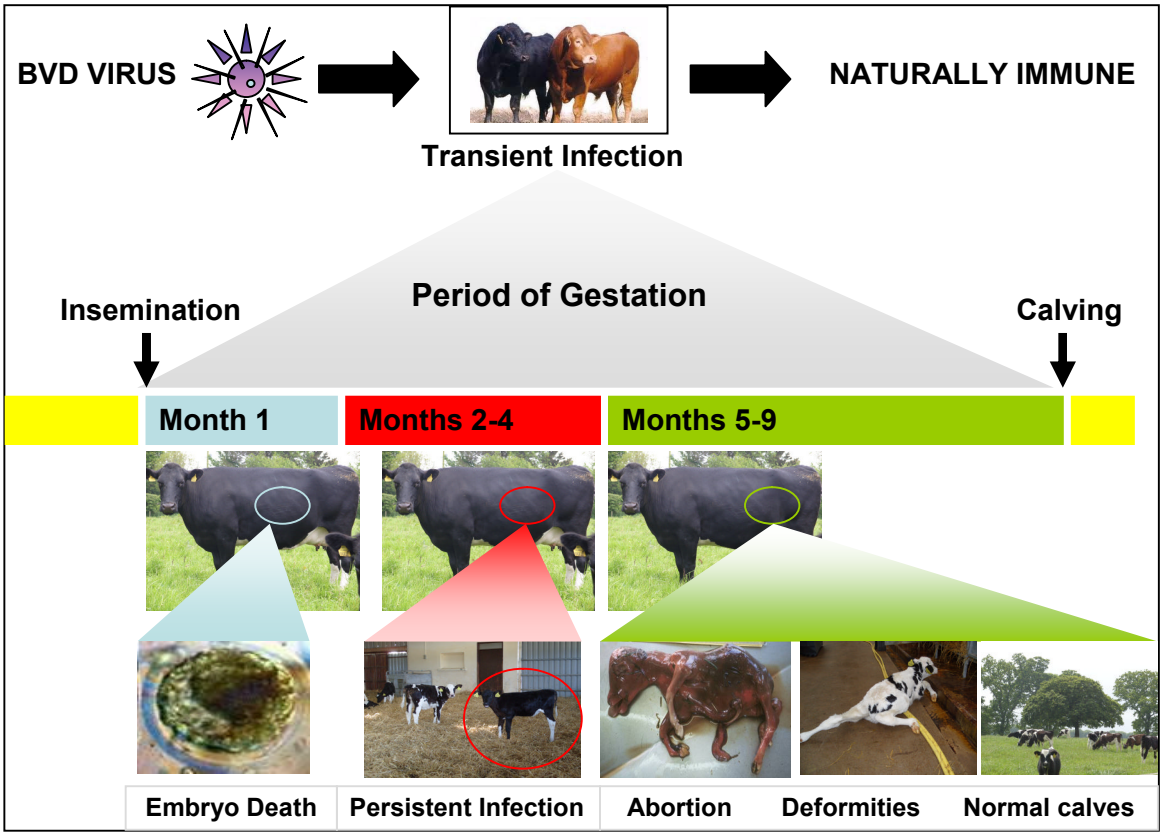
- Persistent viral infection (PI). This type of infection can only be generated by infection of an unborn calf between months 2 and 4 of gestation (Figure 1) i.e. calves are born persistently infected and will carry and shed BVD virus for their entire lives. PIs, therefore, can only be generated in-utero and cannot develop from previously healthy animals. It should be noted that PIs cannot be cured and will allow the BVD virus to persist in a herd. PI animals can look perfectly healthy or may look noticeably below target weight.

Both transient and persistently infected animals shed virus particles in all bodily secretions such as nasal and oral discharges, tears, milk and semen. Persistently infected animals shed significantly higher levels of virus than transiently infected animals and as such pose a greater threat to the health status of a herd. The key to control of BVD, therefore, is culling of PIs as these act as the constant source of virus in a herd. **PI removal is an essential step in the control of BVD.**

Indications that BVD exists in a herd include:

- Poor fertility (conception rates, % empty), having ruled out other causes,
- Poor calf health i.e. unprecedented or undeserved level of calf scour and/or pneumonia,
- Increased number of abortions, stillbirths, weak calves, and/or deformities,
- Occurrence of severe acute BVD,
- Occurrence of fatal mucosal disease. This is only possible in persistently infected animals and is characterised by very severe diarrhoea and rapid deterioration of the affected animal. This can be accompanied by respiratory illness, lameness due to inter-digital ulceration and reduced appetite due to ulceration in the mouth.

Figure 1. Possible outcomes of BVD viral infection.



From Figure 1, it can be seen that if the dam becomes infected with BVD for the first time during gestation, there are a number of possible calf outcomes, depending on the time of gestation that the exposure occurs. If exposure and transient infection of the dam occurs during month one of gestation, embryo death will result with the dam returning to heat. If infection occurs during months two to four of gestation, a persistently infected (PI) calf will result. If infection occurs during months five to nine of gestation, a number of possible outcomes are possible. These include abortion, calf deformities such as extra or missing limbs, lack of anal development and calves lacking in balance. Infection of the dam, at this time, can also result in the birth of perfectly healthy off-spring.

Direct animal contact is the most efficient method of viral transmission from one animal to another. Although, it should be remembered that indirect transmission by dirty footwear, contaminated housing, veterinary equipment and farm visitors can also occur, although the risk is lower. Following diagnostic testing, if a PI is found in the herd, **IT SHOULD NOT BE SOLD**. A persistently infected animal cannot be cured and should be immediately culled. Under no circumstances should a known PI

be kept in contact with the breeding herd or the cycle of BVD infection will continue. The presence of a PI in a herd will also seriously undermine the effectiveness of BVD vaccination programmes. Vaccination should not be viewed as the sole method of BVD control. Vaccination must be combined with PI removal and farm biosecurity to optimise BVD control. It is possible to accurately test for PIs using blood and tissue samples and a testing programme should be initiated should the possibility of PIs in a herd be indicted by either clinical signs or an initial test screen. A step by step guide to BVD control is outlined in a later section.

IBR

IBR is caused by Bovine Herpes Virus 1 and is a highly contagious viral disease of cattle. Direct animal contact is the most efficient method of IBR virus transmission with nasal discharges from infected animals containing large amounts of virus. Animals that have become exposed to the virus in their lifetime can become carriers of the disease and as such pose a threat to the beef herd. Stress re-activates latent infections in carrier animals that then infect additional animals in the herd and maintain the cycle of infection (Figure 2). As with BVD indirect transmission can also occur although of lower risk.

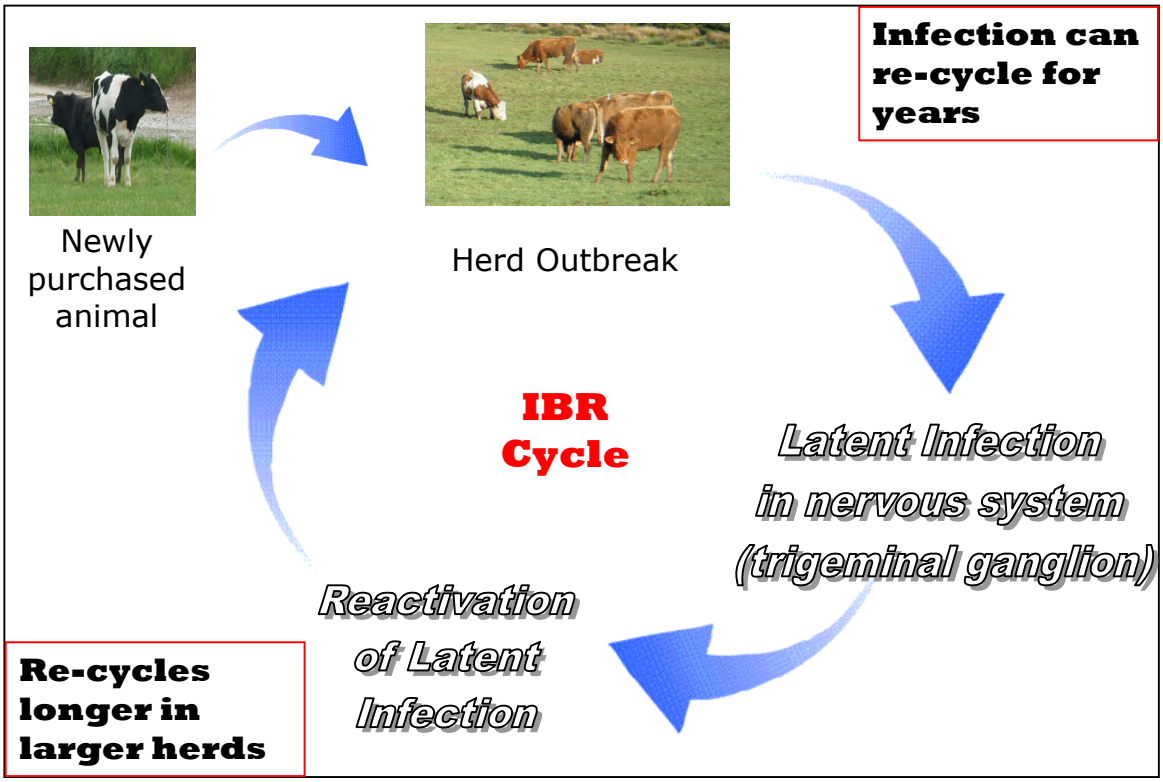
IBR manifests itself in two ways in an infected herd.

1. <u>The initial outbreak</u> – this is characterised by:
    - High fever
    - Nasal discharge – sore, inflamed, crusty nose
    - Sore and cloudy eyes (conjunctivitis)
    - Severe pneumonia due to secondary bacterial infections
    - Abortions in the second half of pregnancy
    - Increases in calf pneumonia

Outbreaks can be particularly severe in beef rearing and fattening units (Radostits et al., 2006).

2. <u>Secondary outbreaks</u> – these are not as severe as the initial outbreak and are characterised by:
    - Increased level of calf pneumonia
    - Increased level of adult pneumonia
    - Occasional abortions in the second half of pregnancy

Figure 2. The infection / re-infection cycle of IBR



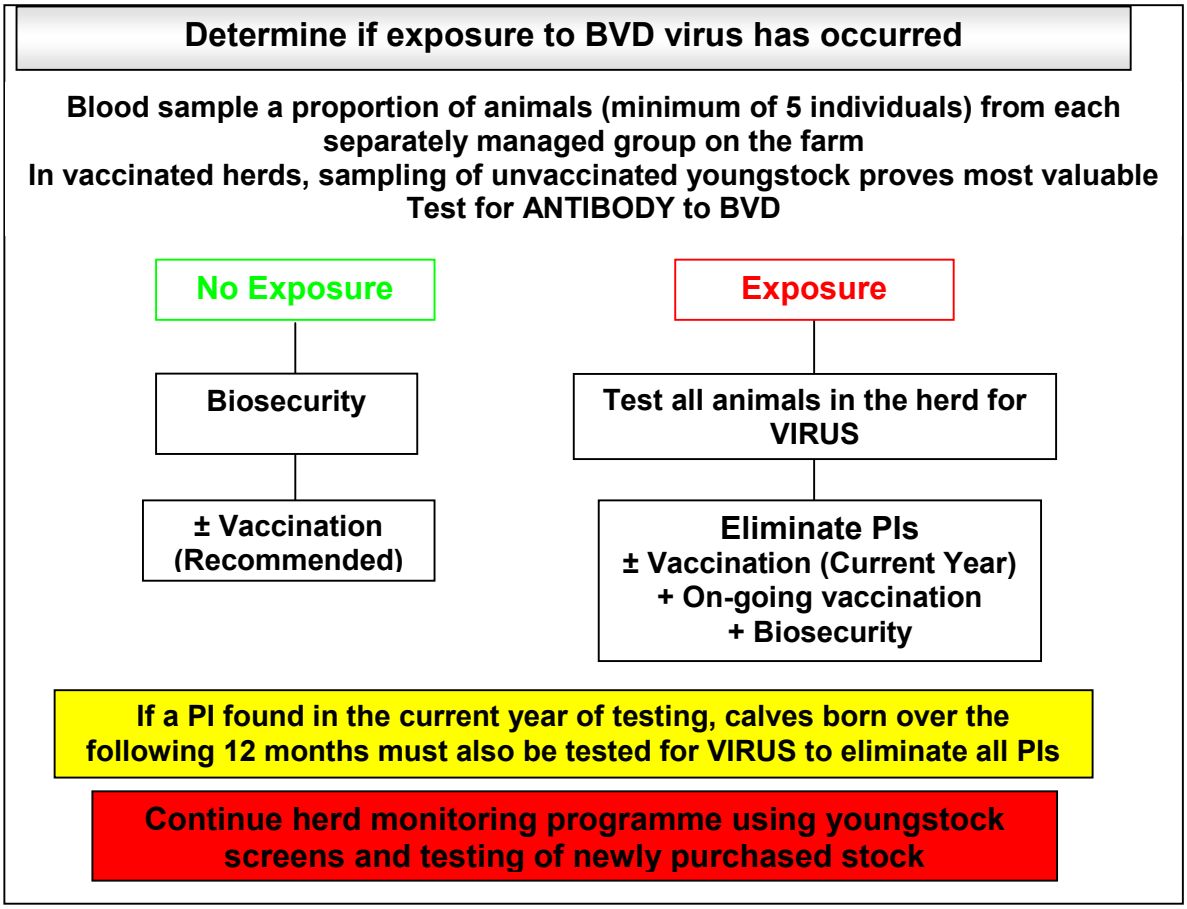
Following diagnostic testing, if latently infected carriers are detected, they should NOT be sold into IBR-free herds. IBR carriers will shed the virus intermittently over their lifetime and will place a herd at risk of continuing IBR outbreaks. As the number of potential carriers in a herd may be high, immediate culling of carrier animals is often not an option. In this case, the priority is to protect new animals entering the herd (replacements, purchases) using bi-annual vaccination. Such a vaccination protocol, combined with annual diagnostic testing will lead to eventual elimination of IBR from the herd through natural culling of carrier animals. It should be noted that an initial outbreak of IBR can be controlled, and its impact reduced, by use of a modified-live vaccine. These vaccines are designed to function in the face of an outbreak and to protect against the generation of new carrier animals. If an IBR outbreak is suspected, the importance of rapid vaccine intervention cannot be stressed highly enough.

Pedigree breeders should be aware of the fact that candidate bulls for AI will be rejected if they test positive for antibodies to IBR. There is no distinction made between antibodies to vaccine and antibodies to the actual IBR virus for the purposes of screening bulls for performance testing. Such animals should NOT be vaccinated. Therefore, if intended for performance testing and these animals should be isolated

immediately from high risk animals on the farm, if an outbreak has occurred. It should also be remembered that it is possible for modified-live vaccines to be transmitted from one animal to the next, resulting in antibody generation in bulls that may not have been vaccinated directly, again resulting in exclusion from AI programmes. If producing bulls suitable for performance testing, discuss IBR control plans (with particular regard to vaccination) in detail with a vet knowledgeable in this area.

Figures 3 & 4 provide an overview of generic BVD and IBR control plans. These involve determination of herd exposure to BVD or IBR and the necessary follow up steps to be taken, should viral exposure be indicated. Briefly, it is first necessary to determine viral exposure by blood testing a proportion of each management group on the farm (i.e. adult and follower groups) ensuring that a minimum of 5 animals from each separately managed group is sampled. In BVD vaccinated herds, sampling of 9-month-old (approximately) unvaccinated weanlings for ANTIBODIES to the virus of interest proves most valuable. A gE test for IBR can be carried out on IBR vaccinated animals. If exposure is indicated by detection of antibody positive animals within a management group, control measures have to be put in place. These control measures include whole herd testing to identify persistently infected (PI) animals, as in the case of BVD, or latently infected animal as in the case of IBR. As the number of PIs identified in a herd is usually low (1-3 in a 100 cow herd), immediate culling of these animals should be undertaken. The number of latently infected IBR carrier animals in a herd can be high and so a combination of vaccination and diagnostic testing is the most economical option to control and eventually eliminate IBR from a herd (Figure 4). All vaccination and testing programmes MUST BE supported by a minimum level of biosecurity to ensure continued BVD and IBR control and prevent re-introduction to the herd. For those interested in maintaining high health status within their herds, accreditation programmes are now available in Ireland which outline strict guidelines which must be followed in order to achieve accreditation status (Anon, 2011).

Figure 3. Monitoring and control of **BVD** in a beef herd



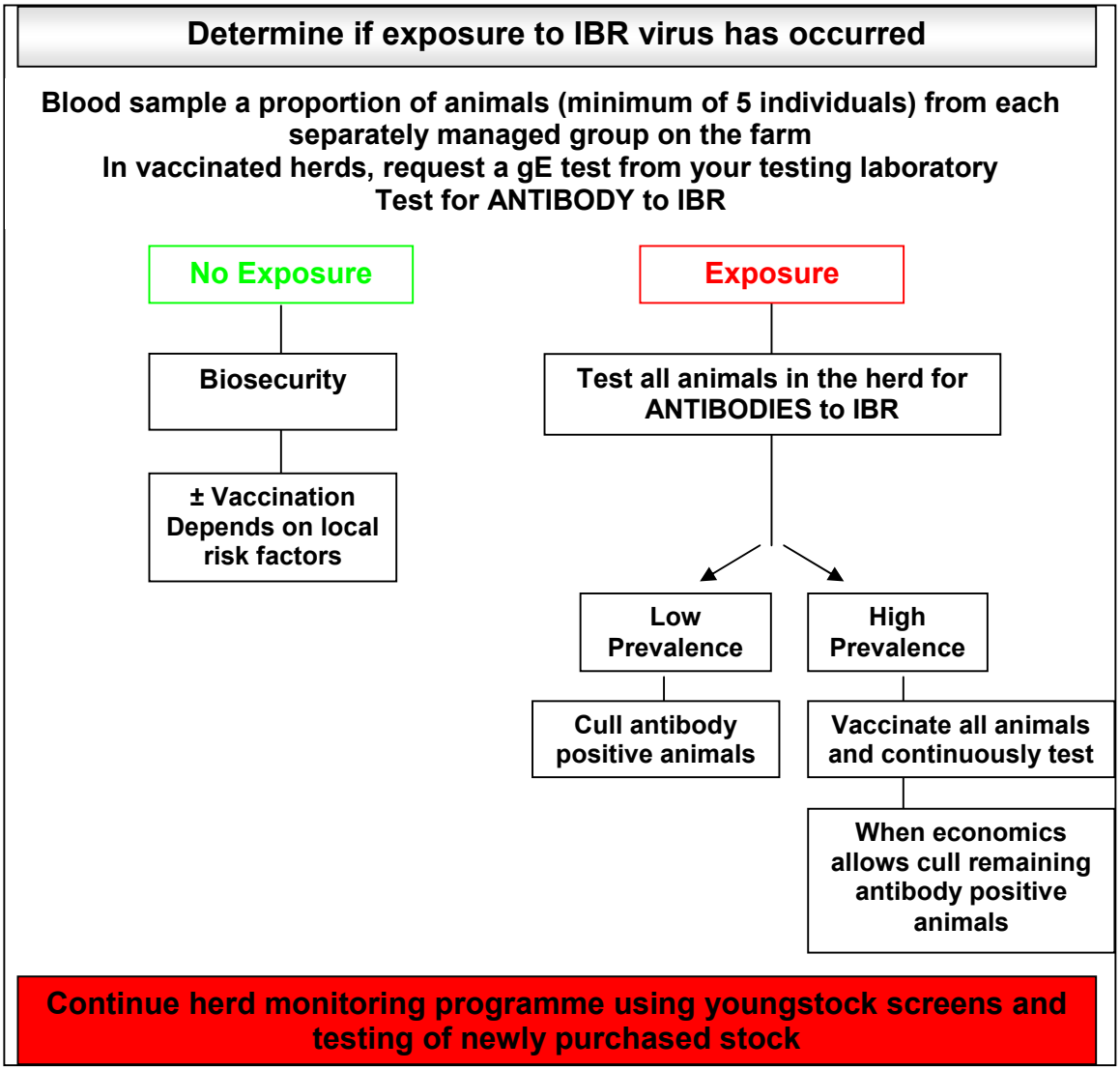
Drawing up a herd health plan

In drawing up a health plan for BVD and IBR it is essential to;

- Include your vet in the process. Your vet is the best source of clinical information for your farm and will assist in deciding the best course of action for your farm,
- Define the eventual goals of the health plan, i.e. disease eradication versus disease control,
- Include sections on biosecurity, diagnostic testing and vaccination as an effective health plan must include a combination of actions in order to prove most effective (Figure 5),
- List the necessary actions to be undertaken in each section,
- Assign a responsibility for those actions i.e. inspection of farm boundaries, blood sampling of young stock, ear-notching of calves.

The herd health plan should be in the form of a written document and should specify completion dates for all actions to be undertaken. The plan should always include the most recent herd profile as this is essential to ensuring all necessary animals within the herd are sampled and a result generated for a particular disease.

Figure 4. Monitoring and control of **IBR** in a dairy herd

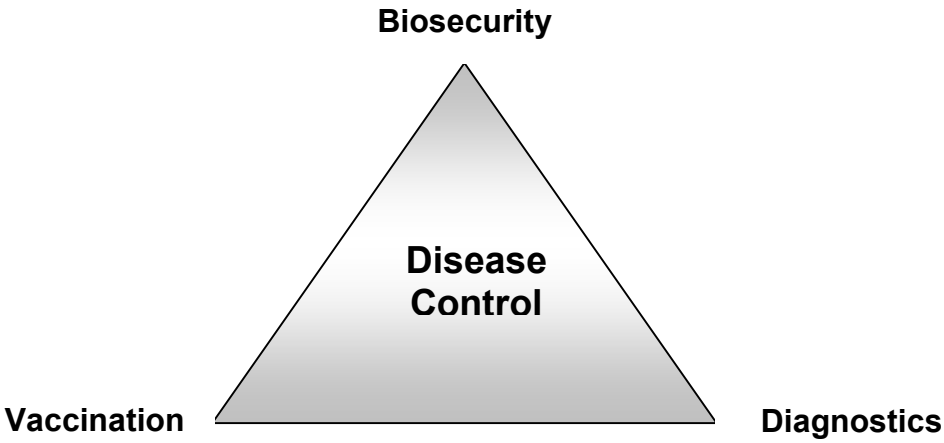


Biosecurity

Biosecurity is the single most important contributor to the prevention of infectious diseases and subsequent losses on a farm. Biosecurity in its simplest form means the implementation of measures to prevent the introduction and spread of infectious diseases. It can be applied at a national level where measures are employed to prevent the introduction of a disease into a country. Prominent examples of this would be the measures employed to keep diseases such as foot and mouth and

rabies out of Ireland. Biosecurity can also be applied at farm level, in order to prevent the introduction and spread of an infectious disease onto an individual farm. The higher the level of a particular disease in a country (prevalence of a disease), the stricter the biosecurity measures required to reduce the risk of disease introduction. With the already high prevalence of BVD in Ireland, and the increasing prevalence of IBR, biosecurity must now become an essential component of good farm management on Irish beef farms.

Figure 5: Components of an on-farm health planning and disease control programme



Implementation of a strict closed herd policy is a critical component of biosecure disease control. A closed herd policy (i.e. no cattle movement onto the farm, including bulls) combined with on-farm biosecurity measures such as stock and disease-proof boundaries (3 meter gap between neighbouring farms to prevent nose to nose contact), footbaths, restriction of visitors, disinfected veterinary equipment and single-use disposable needles, will optimise protection against the introduction of infectious diseases onto a farm. If feasible, a closed herd policy should be the primary biosecurity measure implemented. However maintenance of a closed herd policy may be an unrealistic goal on many beef farms. In order to minimise viral disease risk when purchasing, therefore, the following biosecurity measures can be employed:

- Animals should be purchased from a single source if possible,
- Data on the health history of the source herd, the individual animals to be purchased and their vaccination status should be requested.

- All newly purchased animals including bulls should be quarantined correctly i.e. isolated for at least 30 days in an area that is at least three metres from other cattle groups. With no sharing of feed or water troughs and no mixing of dung and urine. Using an isolated paddock is an ideal solution to avoid problems with indoor quarantine. Animals from different source herds should be quarantined separately.
- On day 21 of the quarantine period, newly purchased animals should be tested for BVD virus and antibodies against IBR.

These procedures will reduce viral disease introduction and transmission in open herds.

As disease transmission can also occur by indirect contact with disease vectors e.g. farm visitors, vehicles etc., the following procedures should be implemented on all farms, regardless of cattle movement, in order to minimise the disease risk.

- Footbaths – the use of well-maintained will reduce the disease risk on farms. These should be cleaned and re-filled regularly,
- Signage should be used to maintain awareness of biosecurity on farm,
- Basic veterinary equipment e.g. nose tongs, should be available on every farm. Transfer of nose tongs from one farm to another without sufficient disinfection between farms can result in disease introduction,
- Separate disposable needles should be used for each animal when administering medications or taking samples,
- Separate rectal sleeves should be used for each animal when scanning, examining or treating cows,
- Importation of slurry should be avoided,
- Importation of colostrum should be avoided,
- Vehicles visiting the farm should be kept at a safe distance from animal areas e.g. housing, holding yards, roadways. This is particularly important in the case of knackery carcass collection vehicles, which should not be permitted to enter farms and should collect carcasses from the farm entrance only.

It is important to recognise that biosecurity measures, once implemented, will act as an insurance policy against viral infectious diseases. It is not a guarantee that a herd will remain disease free but it will significantly reduce the risk of disease introduction into a herd.

Vaccination

Vaccines play a hugely important role in the control of many infectious diseases including BVD, and in particular, IBR. Their use, however, without the implementation of a biosecurity plan and the supporting knowledge provided by diagnostic testing, could potentially undermine their effectiveness in a disease control programme. Over-reliance on vaccination without the backup of proper management, biosecurity and diagnostics should be avoided, with vaccine breakdown a potential consequence. The most important components of a vaccination programme are proper administration of the particular product according to manufacturer's instructions including correct dosage, correct site of administration and correct dosing schedule.

Conclusion

Diseased animals perform sub-optimally and decrease farm profitability through feed wastage, labour and veterinary costs. By using the combined approach of biosecurity, diagnostic testing and vaccination on individual farms, control of BVD and IBR, both on-farm and nationally, will become feasible, and will reduce the economic impact of these costly diseases. The following summary table outlines the basic steps of BVD and IBR control.

Eliminate BVD from your herd by	*Eliminate IBR from your herd by*
1. Testing for and removing persistently infected animals 2. Designing and implementing a biosecurity plan including diagnostic testing 3. Vaccinating	1. Vaccinating with a live vaccine in the face of an outbreak 2. Continuing to vaccinate at six-monthly intervals 3. Testing to establish the level of carriers in the herd 4. Culling carriers out of the herd when economically feasible 5. Designing and implementing a biosecurity plan including diagnostic testing

References

Anon. (2011). www.**checs**.co.uk/.

Radostits, O., Gay, C., Hinchcliff, K. & Constable, P. (2006). Veterinary Medicine: A textbook of the diseases of cattle, sheep, goats, pigs and horses. 10th Edition. Saunders.Sayers, R., O'Doherty, E., Bloemhoff, Y. & Byrne, N. Prevalence of Bovine Viral Diarrhoea (BVD) and Infectious Bovine Rhinotracheitis (IBR) in a subset of Irish Dairy Herds. Proceedings of AVTRW, Spring Meeting, 2011.

Making Greatest Use of Beef Breeding Indexes
– Sire & Dam Information

Dr. Andrew Cromie, Geneticist, Irish Cattle Breeding Federation

Summary

1. There has been huge progress in Irish beef breeding over the past 5 years. Indeed our data recording and genetic evaluation systems are amongst the most comprehensive of any of the major beef producing countries.
2. Recent analysis of data from commercial herds has clearly demonstrated the value of beef breeding indexes as a means to improve the future profitability of our beef industry.
3. This coupled with ongoing developments such as genomics and new maternal indexes, will result in further improvements in the future and to an even more sustainable and profitable beef industry in the future.

Introduction

Recent trends from the ICBF database have indicated a 4.1% drop in the number of suckler beef cows with a calving on an annual basis (Table 1). More worryingly is the drop in beef heifer calvings (down 9.3%/year) and increase in beef cows being culled (up 13%/year) over the same 3 year period. Addressing this rate of decline and ensuring a profitable suckler beef industry is one of the key objectives of ICBF.

Table 1. Trends in Suckler Beef Numbers over the past 12 months*

	2007/2008	2008/2009	2009/2010	Change/yr
Beef cows with a calving during 12 mths	1,009,212	968,660	885,647	-4.1%
Beef heifers with a calving during 12 mths	188,026	166,939	135,665	-9.3%
Beef cows culled during 12 mths	133,303	161,797	186,865	13.4%

** 12 month period is from 1st July to 30th June in given year.*

In this paper we will attempt to identify how beef breeding indexes can help to improve the profitability of our sucker beef herd and in doing so, identify some areas that require particular focus, if we are to build a sustainable and profitable suckler beef industry in the future.

Understanding Beef Breeding Indexes

The Suckler Beef Value (SBV) was first introduced in 2007 and indicates the expected profit (€) per progeny from a breeding animal (male or female). It is made up of various sub-indexes including weanling, carcass, daughter milk and daughter fertility. A quick summary of each index is given in Table 2.

Table 2. Overview of Key Indexes

Index	Description
Suckler Beef Value (SBV)	This is a measure of the overall beef value of an animal.
Weanling Export	The ability to produce profitable weanlings.
Beef Carcass	The ability to produce profitable carcasses.
Daughter Fertility	The ability to produce daughters with good fertility.
Daughter Milk	The ability to produce daughters with good milk production.

In the process of genetic evaluation, data is collected from Irish beef farms, marts and factories on each individual animal. Current evaluations are based on analysis of over 4 million records from these sources. Non-genetic effects such as age, sex, breed and herd management are then corrected for to give an indication of the animals genetic merit for key traits such as carcass weight, weaning weight, calving difficulty, cow milk, cow fertility. Forty traits in total are evaluated on each animal). These traits are then summarized into the various profit indexes outlined above. Thus, an animal with an SBV of €150 is expected to leave an additional profit of €150 per progeny compared to a bull with an SBV of €0. Animals will have strengths and weaknesses in different areas and this is then reflected in their various sub-indexes.

Reliability figures are also published with each index, indicating the amount of confidence that an individual can have in the index. Stock bulls and females generally have reliability figures of approximately 30-50%, indicating that the animals proof could change by +/- €80, as more information becomes available. In contrast AI bulls generally have reliability figures of around 70%, indicating that the animals proof could change by +/- €40, as more information becomes available.

In addition to the €-value figure for SBV and each sub-index, all animals are also ranked on the basis of stars (or €uro-Stars) into 5 categories, based on % rank within the breed, with 5 stars indicating top 20% for the trait, and 1 star indicating bottom 20% for the trait. The benefits of the star rating is that they quickly allow a farmer establish where an animal is strong or weak. For example, a breeding bull could be 5 stars for overall SBV (top 20%), but only 2 stars for a trait such as maternal milk. This shouldn't surprise as the animal that has everything is often very hard to find!

Do €uro-Stars Work?

One of the first questions asked by farmers and breeders is whether the new €uro-Star indexes work? For example, if he buys a bull based on €uro-Star indexes, how confident can he be that the bull will deliver progeny that leave more profit at the time of sale, than a bull with no information or only average values?

Recent work by ICBF has clearly demonstrated the value of €uro-Stars (Table 3). For example, of the 6,191 steers slaughtered during the week ending 1st February 2011 (with carcass index values), 1,067 were 5 star steers and 1,282 were 1 star steers (the progeny of high and low index bulls).

A comparison of slaughter performance for these animals indicates that on average 5 star animals were:

- 74 kg heavier in terms of carcass weight (at the same approximate age),
- had better conformation (by 3 conformation points) and
- had an increased carcass value of over €300 compared to 1 star animals.

Table 3. Beef Cattle Prices for Week Ending 1st February, based on Carcass Index Value

	1 Star	2 Star	3 Star	4 Star	5 Star	Diff (1 vs 5)
Number animals	1282	1394	1276	1172	1067	
Age (months)	29.0	29.8	30.7	29.6	28.8	-0.2
Carcass weight (kg)	343.6	375.7	396.1	403.7	417.5	73.9
EU Grade & Fat Score	O+3+	R=3+	R=3=	R+3=	R+3=	3 pts
Price (€/kg)	3.31	3.39	3.44	3.47	3.45	0.14
Lifetime Gain (kg/day)	0.34	0.37	0.38	0.4	0.43	0.09
Value (€)	€1,137	€1,275	€1,362	€1,400	€1,439	€301
Carcass Sub Index (€)	-€16	€16	€37	€53	€77	€93

Similar trends are apparent for other categories of animals (e.g., heifers, young bulls and cull cows) and for animals traded through marts. The bottom line is 5 star animals deliver more profit at the time of sale than animals of average or low genetic index. The evidence is compelling. When buying a bull or selecting AI straws this spring, farmers should focus on the €uro-Star values, as these values will result in increased profit for their farm business.

Using Indexes to Select Females?

Whilst the indexes are generally acknowledged as an accurate tool on which to select breeding bulls for weanling and carcass traits, do the same principles hold for maternal traits, e.g., maternal milk and daughter fertility performance? This is especially relevant given the much lower reliability figures for these data (typically only 5-10% for stock bulls). Furthermore, this issue prompts the related question, as to whether suckler beef farmers can use the €uro-Star indexes to try and identify maternal beef replacements.

To help answer this question, ICBF have recently undertaken an analysis of fertility performance from over 12,000 ½ and ¾ bred beef heifers, that were born on commercial farms in Spring 2006. In evaluating the usefulness of genetic indexes, we asked 5 relevant questions.

- What % of the original animals had calved at 2 years of age?
- What % of the original animals had a 2nd calving within 390 days of the first?

- What % of the original animals had 3 calves and were still alive on these farms by February 2011?
- What were the differences in fertility performance between ½ and ¾ bred beef females?
- What influence did €uro-Star rating for fertility index have on animal performance?

Results from these analysis are presented in Tables 4 & 5.

Table 4. Fertility Performance of ½ Bred Beef Heifers, Born Spring 2006, based on Fertility Index

Fertility Index	1 star	2 star	3 star	4 star	5 star	All
Number animals	1,524	1,525	1,525	1,525	1,524	7,623
% calved at ~24 months	22.9%	28.2%	32.8%	37.4%	46.6%	33.6%
Average age at 1st calving	31.3	30.5	29.8	29.2	28.4	29.8
% with CI<390 days (1-2)	27.5%	36.7%	41.2%	46.0%	57.0%	41.7%
Average CI Days	435.3	425.2	418.9	410.2	391.6	415.1
% alive & with 3 calves	13.3%	20.5%	25.1%	30.8%	44.8%	26.9%
Average number calvings	1.81	1.95	2.03	2.13	2.34	2.05

CI = calving interval

Table 5. Fertility Performance of ¾ Bred Beef Heifers, Born Spring 2006, based on Fertility Index

Fertility Index	1 star	2 star	3 star	4 star	5 star	All
Number animals	880	880	880	880	880	4400
% calved at ~24 mths	23.0%	29.0%	34.0%	39.0%	48.0%	35.0%
Average age at 1st calving	31.9	31.3	30.3	29.7	28.8	30.4
% with CI<390 days (1-2)	26.0%	32.0%	39.0%	43.0%	51.0%	38.0%
Average CI Days	435.1	422.0	414.5	404.3	397.7	413.6
% alive & with 3 calves	11.0%	19.0%	25.0%	28.0%	42.0%	25.0%
Average number calvings	1.77	1.92	2.06	2.09	2.27	2.02

Results presented in the above tables clearly demonstrate the value of €uro-Star indexes as a means of improving fertility performance on Irish beef farms. For

example, in Table 4, 57% of the 5 star rated heifers had a calving interval of less than 390 days, compared to only 27.5% of the 1 star rated heifers.

On average, some 43% of 5 star females were still on farms and had 3 calvings by February 2011, compared to only 12% for 1 star females. Similar trends are apparent for both calving at 24 months and re-calving within 390 days. Furthermore, the results are consistent for both ½ and ¾ bred females, with little difference in fertility performance between both of these groups of animals. These results clearly demonstrate the value of using the €uro-Star indexes as a means of improving maternal efficiency on Irish beef farms.

Current Areas of Focus

Data from the above tables has clearly demonstrated the value of breeding indexes as a means of improving the profitability of our beef industry. However, these points are often not readily acknowledged within the beef industry. To try and address these issues, ICBF and Teagasc are working closely together on a number of initiatives to help increase confidence in beef indexes and also further improve the accuracy of our beef breeding systems. These include:

1. **Research and Demonstration Farms**

   The Teagasc Grange Derrypatrick herd is currently being expanded to consider additional traits (e.g., maternal milk and fertility) and breeds (including ½ bred females from the traditional breeds) as part of its widened research agenda. This is a welcome development and reflects a strong desire to identify the most profitable beef cow for suckler farmers in the future. Doing this will require accurate recording of these females (at Grange), as well as females from "linked" demonstration farms, e.g. the Teagasc/Farmers Journal BETTER Farm Beef Programme.

2. **New Maternal Indexes for Commercial Beef Farmers**

   ICBF are currently working on a new maternal index, which will help suckler beef farmers identify the most suitable animals for retaining as maternal replacements and those that should be sold for slaughter. The index will have increased weighting on maternal milk and daughter fertility traits (compared to the Suckler Beef Value) and will be available in Autumn 2011.

3. Improvements to Maternal Evaluations

In addition to new indexes, ICBF and Teagasc are also working on improvements to maternal evaluations. This includes the use of insemination and additional calving data in the evaluation of daughter fertility and the use of cow milk scores (as collected recently by farmers through the SCWS) in the evaluation of maternal milk. Both of these pieces of work are nearing completion and are expected to show strong positive effects on the accuracy of evaluation for these important traits.

4. New Weight Recording Services

At this stage, only a small number of commercial (and pedigree) beef farmers weigh their cattle on a regular basis. This is in contrast to dairy farmers, where milk recording is seen as an integral part of their farming business. ICBF are currently undertaking a review of its weight recording service, with the objective of increasing the level of weight recording, through a wider range of service options. It is anticipated that these service options will range from DIY recording (where the farmer owns &/or shares a set of scales with other farmers), to a fully integrated service where the farmer can get the equipment and access to an on-farm technician. Part of this new service will also include a new set of performance recording reports, which will support decision making on the farm. Again it is anticipated that elements of this new service will be available in Autumn 2011.

5. Genomics

Genomics has revolutionised dairy cattle breeding, with an almost doubling of rates of EBI gain, since the introduction of this technology in 2009. Similar opportunities now exist in beef breeding. Indeed Ireland is very well positioned to capitalise on the potential benefits of genomics through having; (i) accurate data on which to base the predictions (as evidenced earlier), (ii) access to DNA for AI and stock bulls, (iii) the necessary skill set to undertake the required research and (iv) an industry structure that can facilitate swift uptake in the technology. One of the constraints to the current research work is having the required funding to undertake the genotyping of historic animals. Over the next few months, ICBF will be working with relevant industry partners to secure these funds and hence commence this work on behalf of Irish beef farmers and the wider beef industry.

Achieving 365 Day Calving Interval & 12 Week Calving Spread in Suckler Herds- BETTER Beef Farm Experience

Adam Woods, Teagasc, Animal & Grassland Research & Innovation Centre, Grange, Co. Meath

Summary

- Breeding and fertility is one of the most important aspects of running an efficient suckler system.
- Cow condition score, bull fertility, the incidence of difficult calving and herd health are the main factors affect fertility. Poor herd fertility has a major impact on farm output and income.
- An outbreak of disease causing poor conception rates or an infertile bull can have a devastating impact on the bottom line for many years after the problem starts. It has been observed from the BETTER Farm Beef programme that having a written plan in place is essential in improving breeding efficiencies at farm level.
- Defining the calving period and setting down clear objectives for calving interval and mortality and working towards achievable targets over a 3 year period in a simple action plan has worked. It is important not to try and achieve these targets in one year as having too many empty cows in one year could put pressure on cash flow for the following year.
- With a disciplined approach to breeding, real progress can be made at farm level which in turn will have a positive effect on profitability.

Introduction

The profitability of a suckler herd is directly related to the number of calves reared per cow or heifer served annually. Inefficiencies are not welcome in any business and suckler beef farming is no exception. Recent figures from ICBF show that the average calving interval for all suckler herds in the country is 406 days which is somewhat off the target of 365 days. A cow that does not calve every 365 days is a drain on the system and not earning her keep. The calf per cow per year figure is at 0.78. This is figure is got by dividing the number of live calves at 28 days by the number of eligible females in the herd over 22 months of age. This means that in a 100 cow suckler herd the average farmer is weaning 79 calves from 100 cows which

is grossly inefficient. The target is 95 live calves per 100 cows (0.95/calves/cow/year). If this farmer was producing weanlings and could raise this figure by 0.1, it would mean an extra 10 calves to sell or approximately €6000 - €7000 extra in sales for the year, which would be a big rise in output on any farm. It has been shown in the past that it costs between €500-€800 to keep a suckler cow for the year depending on a number of variables including land type and whether the cow calves in the spring or autumn. It is therefore essential that she produces a viable calf every 365 days to deliver an output which will cover this expenditure and produce a profit.

There are two main ways to improve suckler cow fertility:

1. Increase conception rates:

If 100 cows were put to the bull and achieved 60% conception in each oestrous period, then the following pregnancy rate would be achieved.

- 3 weeks – 60 in calf
- 6 weeks – 84 in calf
- 9 weeks – 93 in calf
- 12 weeks – 97 in calf

This means that a conception rate of 60% leaves just 3 cows empty after a 12 week breeding season (natural service or AI). If this conception rate was to drop to 40%, then after 12 weeks breeding there would be 14 'empty' cows. Good heat detection, AI technique and timing, avoiding difficult calving and stock bull fertility are all important aspects in ensuring high conception rates.

A high first 3 week calving percentage will mean:

- Heavier calves at weaning
- Heavier and more fertile homebred heifers at mating
- Reduced labour requirements due to calving taking place in one batch rather than being spread out over a long period
- Less disease spread from older to younger calves

If using AI, heat detection is very important and will have a negative effect on conception rate if not carried out properly. Table 1 shows the severely adverse effect of both poor heat detection and low conception rate on the 90 day pregnancy rate.

Table 1. Effect of heat detection rate and conception rate on pregnancy rate

		Conception rate			
		60	50	40	30
Heat Detection Rate %	90	96	91	83	71
	70	91	82	73	61
	50	76	68	59	48
	40	67	59	50	40

Source: Diskin, M.G.,Teagasc, Athenry.

2. Reduce the interval between calving and conception

Cows undergo a period of recovery after calving before normal fertility is regained. The uterus needs time to recover from the calving process and return to normal size. This takes up to 40 days or longer if there was calving difficulty or uterine infection. The length of time that ovaries take to regain normal cyclist after calving can range between 25-180 days in beef cows an is related to body condition score and plane of nutrition. First calvers can often have a delayed return to oestrous due to poor condition score at calving and incorrect nutrition post calving. The target is to have most cows bulling by 50 days post calving. (Figure 1).

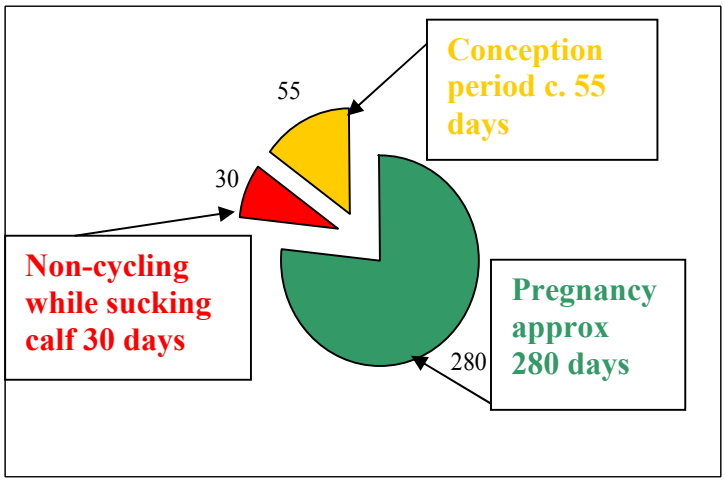


Figure 1. Annual cycle/breeding calendar for beef cow

Cows that give birth early in the calving season will tend to conceive more easily than cows calving later because of a higher fertility status and also they have longer to recover before the next service period (Figure 2).Calves born early in the season usually have heavier weaning weights which will increase their value when being sold

and is another good reason for getting cows in calf as quickly as possible after calving.

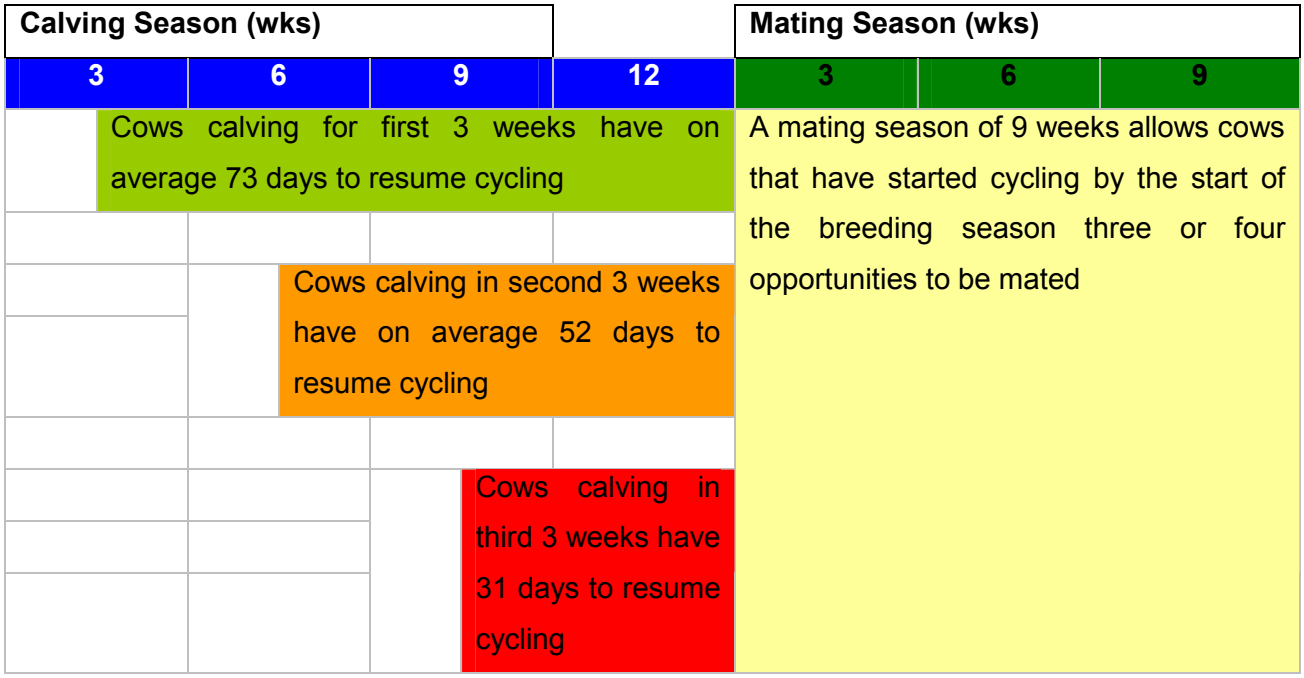


Figure 2. Effect of calving cows early in the calving season on resumption of cycling

The main factors that affect the post partum anoestrous interval are:

- Maternal offspring bonding
- Nutrition
- Parity
- Genotype
- Male effect

Bull Fertility

Bull fertility is key to maintaining a compact calving period, maximising the genetic potential and value of the calf crop and overall herd profitability. Ensuring the herd sire is ready for work requires forward planning as semen production takes 60 days. The bull must be in good health and ready to work at least 10 weeks before the breeding season begins.

Key Points:

- Bulls must be able to maintain body condition score (ideally BCS 3), repeatedly mount and serve cows and place fertile semen in the cow for 12 weeks and have a long working life in the herd.
- Good libido is important, especially in larger herds or in difficult terrain so that the bull is active in seeking out and successfully serving all cows in heat.
- Quarantine new bulls for 4 weeks after purchase for health screening and acclimatisation.
- Avoid sudden changes and do not overfeed as this can reduce fertility and lead to feet problems.
- Check feet and legs well in advance of the breeding season, as good locomotion is essential for getting cows pregnant. Take remedial action if required.
- Provide exercise where possible (e.g. site feed and water at opposite ends of the shed or field)
- Approximately 25% of all working bulls are sub-fertile or infertile.
- Watch the bull working to check he is serving cows correctly.
- Rotate bulls or scan cows early so that an infertile bull or sub fertile bull can be identified early. Even bulls that have passed a breeding soundness examination can go lame or suffer reduced fertility during the breeding season.
- Record when you see a cow being mated and watch for signs of cows coming on heat repeatedly.
- Don’t overwork a young bull (20 cows maximum for first season)

Managing Body Condition Score (BCS) to improve cow fertility

The hormones which control fertility and nutrition are closely linked. Under normal conditions dietary energy is the main factor limiting the reproductive performance of suckler cows. The most critical time for cow nutrition is for 6 weeks before calving through to 6 weeks after service. The best practical way of judging whether cows are being fed appropriately is by scoring them for body condition score (see table 2 compiled by Professor Michael Diskin, Teagasc, Athenry). Suckler cows can lay down fat when feed is plentiful and mobilise it again when feed is expensive or in limited supply. Spring calvers should be in good condition in late autumn allowing for

planned weight loss over the winter. However, excessive weight loss should be avoided as this can delay return to breeding after calving.

Table 2. Body Condition Score targets at critical stages in annual production cycle

Calving Season	Mating	Mid Pregnancy	Calving
Jan-Feb	2.5	3	3
March-May	2.5	3	2.75
Autumn	2.75	2.25	3.25

At weaning, check the condition of all cows and heifers and group them according to BCS. Heifers, first calvers and thin cows should be separated and fed to achieve target BCS, to ensure that they continue to grow and reach their target live weight for the subsequent breeding season.

Avoid Difficult Calving

Difficult calving greatly increases the incidence of reproductive problems in the following breeding season and also reduces calf survival. There are four main causes of calving difficulties:

1. Calves are too big (due to poor sire choice).
2. Dams are poorly grown (caused by poor management of maiden heifers).
3. Dams are over- fat (due to loss of control over body condition).
4. Dams have excessive hind quarter muscling or inadequate pelvic size.

Good management of body condition score (BCS) throughout the year can reduce calving problems considerably. Choose sires with a low calving difficulty figure. When calving the cow only intervene when calving is not proceeding as normal. Uterine infections can significantly delay the onset of cycling so it is important to practice good hygiene at calving time. Always use gloves and lubricant to examine cows. Have adequate calving pens with ample dry bedding.

Breeding to Improve Suckler Cow Fertility

The genetic traits that influence reproduction tend to have low heritability so genetic progress through selective breeding takes a long time. Breeding strategies to produce female replacements must take into account a range of traits including growth rate, milking ability, temperament and ease of calving. Farmers breeding their

own replacements have the advantage that they know the cows from which to keep heifers to make future cows. Reproductive traits are greatly enhanced by crossbreeding due to hybrid vigour. These advantages can be summarised as follows:

- 10% increase in conception rate
- 10% improvement in calving ease
- 7.5% increase in number of calves raised to weaning
- 5-10% increase in milk yield

The right crossbreeding strategy can increase the weight of calf weaned per cow by up to 23%. To maximise hybrid vigour the crossbred cow should be crossed with a sire of a third breed (neither of the breeds in the cow)

Health Issues Affecting Fertility

Most health problems will affect fertility; some more than others. All abortions and stillbirths should be investigated by a vet. Possible causes include infectious bovine rhinotracheitis (IBR), bovine virus diarrhoea (BVD), leptospirosis, neospora, salmonella and campylobacter. While Johne's disease does not cause abortions, infected cows suffer weight loss and are slow to go back in calf. Good general herd health is vital to optimise fertility.

Discuss with your vet and advisor:

- A herd health plan
- Vaccination policies
- Dosing regime
- Quarantine procedure for purchased stock

The BETTER Farm Experience

At the beginning of the Teagasc/Irish Farmers Journal BETTER Farm Beef programme the management team set out some core objectives for each of the farms in relation to addressing low levels of output, improving grassland management, breeding efficiency and fertility and animal health on the farm. Breeding efficiency was one of the first items to be addressed. The first step was that the farmer had to join HerdPlus, operated by ICBF. This was an invaluable tool in

assessing the current state of play on the farm in relation to calving interval, calving spread, suckler cow breeding performance, past progeny performance, etc.

A Case Study: Cathal Crean, Woodpark, Gorey, Co. Wexford

Cathal Crean farms just south of Gorey in Co. Wexford. There are currently 85 suckler cows on the farm with the aim of going to 100 suckler cows over the next 2 years. His beef system consists of finishing continental heifers off grass at 18-20 months and finishing bulls at 18 months indoors on ad-lib meal after grazing for the 2nd spring and summer. Breeding performance had fallen in recent years and in 2008 his calving interval was 411 days and he was calving cows for 9 months of the year in a nominally spring calving herd (Table 3). On entry to the BETTER Farm Beef programme, one of the first decisions made was to fix a defined calving period. This was decided to be Jan/Feb/Mar, based on turnout date and finishing dates for stock. Cathal then went through all his cows visually and identified any poor performers. The ICBF suckler cow report was used in this process to identify repeat poor performers in terms of calving interval and calf performance. Most of the cows that had slipped to the summer months had poor fertility and were identified for culling. Because of the vigorous culling (23 cows) it was decided that instead of buying in maiden heifers and taking a hit on output for two years, some cows and calves would be purchased to avoid a reduction in output. Cows that calved in April and May were kept as a group and fed 2 kg meal at grass to make sure they resumed cycling quickly. The 15th June was identified as the date the bull was to be removed as this would mean calving would be finished by end of March. Replacement heifers were bred in March to calve in December, one month before the main herd, to give them extra time, as first calvers, to go back in calf. Dry cow minerals are fed pre- calving and early calving cows get 2 kg ration post- calving to keep the BCS on target. A Limousin bull with good maternal traits was purchased with a view to breeding replacements from within the herd.

Table 3. Calving data from Cathal Crean's herd over past 3 years

Cathal Crean	07/08	08/09	09/10	Target	Nat Av.
Live calves at birth	58	80	65	100	
Calving Interval (CI, Days)	422	375	394	365	406
Calves per cow per year	0.75	0.94	0.86	0.95	0.78
% females not calved	12	2	5	0	14.2
% dead at birth	1.7	0	1.2	2.5	4.8
% dead at 28 days	3.4	2.5	1.5	2.5	6
Months calving (calving spread)	5	9	4	4	

Nat Av. = Nation Average

Acknowledgements

This conference would not be possible without the cooperation and assistance of many people. Firstly the speakers that presented and prepared papers for the conference booklet. Also the chairmen of each session and panellists in the first session and Ger Ryan & John Lynch, Dovea and Rose Goulding, NCBC for assembling AI exhibit. Special thanks to all farmers who supplied stock for the live exhibit. Teagasc staff in Kilkenny especially John Moloney, Frances Carroll, Terry Carroll, Austin Flavin, Loretto O'Driscoll and Administrative Staff . Teagasc staff at Ballyhaise Loreto Ferguson, Sinead Hetherton & Michael McHugh. Michael Fitzgerald Teagasc adviser Wexford. Siobhan Kavanagh & Liam Fitzgerald, Teagasc for editing papers and managing presentations. Pat Dillon, Moorepark. Eric Donald & Alison Maloney Oak Park. Padraig Gormley, Michael Fagan, Padraig O'Connor, Tony Curry, Martin Ryan and Frank Smith for assistance at Kilkenny. Advisers James Doran, Hugh Mahon, Paddy O'Brien, Mark Trimble, Dick O'Shea, Deirdre Glynn, Mark Slattery, James Keane, Michael Daly and Shane McHugh for assistance in Kilkenny. Also to Teagasc Regional Managers and Advisers for promoting the event locally with clients, ICBF & IFA for sending out text messages. Also the farming press for their coverage and promotion prior to the event. Michael Lynch and staff at Cillin Hill Mart complex for an outstanding venue & wishing them continued success with future ventures. Finally to all of you that attended we hope you have benefited from the day and that you can put into practice what you have learned and thereby improve your ability to achieve a more profitable return for your efforts at all stages in the beef production chain.