

Suckler Beef

Achieving a gross margin of €1,000/hectare



Tuesday, 15th June 2010

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

Bio-security, Health and Safety

To minimise disease risks and accidents, visitors entering and leaving Grange are asked to:

- use footbaths
- not handle cattle
- not enter pens or paddocks containing cattle

Thank you

Acknowledgements

**Teagasc acknowledges FBD Insurance for their sponsorship of the
Teagasc Grange Suckler Day**



Special Need Assistant can be provided on the day

**Suckler Beef Day at Grange:
June 15th 2010**

Contents

		<u>Page</u>
Outdoor Stands		
Introduction.....	<i>E. O’Riordan & B. Smyth</i>	3
Background & Overview to the Derrypatrick Herd.....	<i>M. McGee, W. Minchin & P. Crosson</i>	6
The Derrypatrick Herd, Grange – Performance to Date.....	<i>W. Minchin, M. McGee & P. Crosson</i>	10
Producing high quality pastures for beef.....	<i>E. O’Riordan, P. Kelly & A. Van Bysterveldt</i>	14
Steps towards the efficient use of AI in suckler beef herds.....	<i>M. G. Diskin & Tom Coll</i>	17
Aspects of animal health in suckler beef systems.....	<i>B. Earley, M. McGee & J. Mee</i>	20
Financial targets for the Derrypatrick Herd.....	<i>P. Crosson, M. McGee & W. Minchin</i>	22
Indoor Stands		
Dairy beef systems for steers and bulls.....	<i>M. G. Keane E. O’Riordan & R. Prendiville</i>	25
Replacing fertilizers with slurry.....	<i>S. Lalor</i>	27
Irish Cattle Breeding Federation.....	<i>P. Donnellan</i>	29
Prospects for Irish beef and live cattle trade....	<i>J. Burke</i>	31
Animal Health Ireland.....	<i>J. O’Flaherty</i>	34
Animal Bioscience	<i>R. Dewhurst, D. Kenny, D. Morris, S. Waters & O. Keane</i>	36
Farm Safety.....	<i>J. McNamara</i>	-
Discussion forum.....	<i>Chairman : Prof G. Boyle</i>	-

Introducing the Grange Suckler Beef Research Demonstration Farm (*Derrypatrick Herd*)

Edward O’Riordan¹ and Bernard Smyth²

¹ Enterprise Leader, Animal & Grassland Research and Innovation Centre, Teagasc, Grange, Dunsany, Co. Meath

² Teagasc Drystock Programme Leader

On behalf of all Teagasc staff and especially those at Grange, it gives us great pleasure to welcome you to this Teagasc Suckler Beef Day.

The focus of this day is to help suckler farmers to identify the most appropriate technical information that contributes to farm profitability. Most of the issues addressed today are, in our view, those that are directly under your control. It is our hope that you will find the information at each stand of interest to you and applicable to your farm.

See Grange website for background and weekly updates:

<http://www.agresearch.teagasc.ie/grange/researchfarms>

The Derrypatrick Herd

The Derrypatrick Herd, Grange was established in 2009 for the purposes of research demonstration to Irish suckler beef producers. The objective is to establish a high profit, grass-based, sustainable suckler beef systems research herd evaluating and demonstrating optimal animal breeding, grass-based feed nutrient supply and technical efficiency. The animals or carcasses produced will be suitable for the high priced European continental markets i.e. lean carcasses of good conformation.

The research demonstration farm will entail ~120 spring-calving suckler cows comprising four breed types (with 30 cows per breed), these being: Limousin × Holstein-Friesian (LF), Limousin × Simmental (LS), Charolais × Limousin (CL), and Charolais × Simmental (CS), all of known genetic merit, mated to high genetic merit, late-maturing sire breeds, producing progeny to slaughter on predominantly grass-based, calf-to-beef systems operated at a relatively high stocking rate (>220 kg organic Nitrogen/ha). The cow breed types selected broadly represent about two-thirds of the suckler “cow types” in the country. The suckler cow replacement breeding strategies planned for the herd is also representative of what is available to Irish farmers, that is either sourcing replacement heifers from the dairy herd or from the suckler herd. The breeds correspond to over 80% of sires bred to suckler cows, nationally.

At purchase, the mean suckler beef value (SBV) of the LF was 81, whereas, that of the three late-maturing “continental” crossbreds was ~130, which places these animals in the top 5 to 10 % for commercial beef animals. Mean reliability of the SBV was 30%. The breeding policy will exploit breed differences and hybrid vigour which for crossbreeding are due to a combination of enhanced reproductive performance, lower calf mortality and higher calf growth. For the crossbred cows this advantage can be in the order of +13% and up to +21% when a sire of a third (different) breed is used.

For 2010, where replacements are produced within the herd, a Simmental sire is used on the LS and CS cows, and a Limousin sire on the CL cows. This two-breed, criss-cross, rotation is a relatively simple breeding programme and maintains about two-thirds of the level of hybrid vigour identified above.

The herd will operate as a high stocking rate, spring-calving, grass-based calf-to-beef production system. Mean calving date will coincide with the start of the grass growing season. Target live weights at weaning, yearling and slaughter (~20 mths) for heifer progeny of a “mature” cow herd are, ~295 kg, ~375 kg and ~565 kg, respectively. Corresponding values for bull progeny are ~320 kg, ~400 kg and ~665 (~18 mths) kg. Target carcass weights are ~310 kg for heifers and ~390 kg for bulls.

Due to the considerably lower comparative cost of grazed grass as a feedstuff, maximising the proportion of high digestibility, grazed grass in the annual feed budget, while simultaneously achieving high animal performance and providing sufficient grass silage of appropriate digestibility for the indoor winter period, is central to the production system. The annual feed budget of the calf-to-beef system will comprise approximately 60% grazed grass, 30% grass silage and 10% concentrates. The calf-to-weanling component will comprise approximately 73% grazed grass, 26% grass silage and 1% concentrates.

Performance to date

The 2009 breeding season commenced on April 29th and finished on July 15th. All heifers were bred to Blonde d'Aquitaine sires using either AI or natural service (two stock bulls) thus, allowing hybrid vigour to be maximised and further allowing the valid comparison of the four cow breed types. Scanned pregnancy rate was 94%, mean expected calving date was March 12th, with a calving spread of 11 weeks.

During the grazing season, heifers were grazed as four groups with each breed type represented within each herd, while two herds grazed swards to a stubble height of 4.0 cm another two grazed to a stubble height of 6.0 cm. Live weight gain over the grazing season was similar for the breed types. There was no significant difference in animal performance between the two grazing systems. Extra grass was harvested from the units grazed to a lower post grazing height.

In mid-November animals were housed in slatted pens and for the first part of the winter, they received grass silage (68% DMD) *ad libitum*. One month pre-calving, 30% straw was included in the diet. Dry cow minerals were offered daily. Two to five days prior to expected calving, heifers were removed from the slats to individual straw bedded calving pens. After calving, they were offered 2 kg/day of concentrate in addition to grass silage *ad libitum* until turnout to pasture. They remained in the calving pens for a number of days to encourage calf bonding. The cow and calf then moved back to the slatted pens where the calves were held in a separate creep area at the back of the pen. Calves had twice daily access for suckling. Calving commenced on February 12th and finished on May 4th, with a mean calving date of March 12th.

In terms of performance (to date), in general, LF heifers are lightest and CS heaviest with LS and CL intermediate. Although BCS did not differ between the heifer breed types at the start of the winter, it is now (mid-May) lower in LF than the other three breed types. Silage dry matter intake (kg/day), calving difficulty score or calf birth weight did not differ significantly between the heifer breed types. Calf average daily live weight gain from birth to ~mid-May is highest for LF and lowest for CL, with LS and CS intermediate.

During the 2010 breeding season (from April 26th to July 10th (11 week calving window)), vasectomised bulls with chin balls, in conjunction with tail paint, are being used as heat detection aids and for the current breeding season, ~50% of LS, CL and CS cows will be bred to (AI) maternal sires to produce replacement heifers, with the remaining ~50%, and all of the LF cows, bred to a terminal sire breed. The maternal sires were primarily selected on the basis of good maternal traits but also on calving ease and beef carcass index (BCI). The terminal sire was primarily selected on the basis of calving ease and BCI.

In terms of herd health, on arrival, all heifers were tested for bovine viral diarrhoea (BVD), Johnes and Neospora, and vaccinated against BVD, respiratory syncytial virus (RSV), parainfluenza-3 (PI-3) virus, infectious bovine rhinotracheitis (IBR) Salmonella and treated for internal and external parasites. At least 4 weeks pre-breeding cows were vaccinated against Leptospirosis and BVD. They received an IBR vaccine twice annually and were also vaccinated between 12 and 3 weeks

pre-calving for *E coli*, rotavirus and coronavirus (calf scours). Calves received an IBR and RSV intranasal vaccine 2 weeks after birth plus a booster 12 weeks later. Pre-weaning, calves will receive a vaccine against respiratory disease. Treatment for internal and external parasites (stomach worm, lung worm, fluke, lice) are planned.

Financial targets

The targets set for the Derrypatrick Herd are substantially greater than those currently prevailing on Irish suckler beef farms. The overriding principle driving profitability is high levels of output within cost-efficient, grass-based systems of production. Thus, gross output is 233% and 160% that on the top third of Teagasc, National Farm Survey (NFS) and Teagasc, eProfit Monitor (ePM) farms, respectively. Furthermore, although variable costs are greater for the Derrypatrick Herd, as a proportion of gross output they are considerably lower. Finally, target gross and net margin are much greater for the Derrypatrick Herd relative to NFS and ePM farms.

Output value is driven by stocking rate, calving rate, live weight per day of age and carcass value. Analysis at Grange has shown that, for the Derrypatrick Herd at current prices, each 0.1 livestock unit increase in stocking rate corresponds to an increase in gross and net margin of €33/ha and €26/ha, respectively, where stocking rate ranges from 1.9 to 2.9 LU/ha. Based on this analysis, the stocking rate for the Derrypatrick Herd will be at the upper end of this scale.

A high level of reproductive performance is a critical element of profitable suckler beef production. For example, each additional percentage unit increase in calving rate corresponds to an increase in gross and net margin of €/ha at current prices for the Derrypatrick Herd.

The implications of variations in live weight per day of age shows that gross and net margin are increased by €30/ha for each 25 g/d increase in animal performance.

The implications of varying mean carcass grade from R=4+ to U=3 shows that, under the current pricing structure, gross and net margin would increase by 16% and 31%, respectively.



Background & overview to the *Derrypatrick Herd*

Mark McGee, William Minchin and Paul Crosson

Livestock Systems Research Department, Animal & Grassland Research and Innovation Centre, Teagasc, Grange, Dunsany, Co. Meath

Introduction

The Derrypatrick Herd, Grange was established in 2009 for the purposes of research demonstration to Irish suckler beef producers. The objective is to establish a high profit, grass-based, sustainable suckler beef systems research herd evaluating and demonstrating optimal animal breeding, grass-based feed nutrient supply and technical efficiency. The animals or carcasses produced will be suitable for the higher priced continental EU markets i.e. lean carcasses of good conformation.

It is recognised that due to having many beef breeds (and their crossbreeds), numerous production systems and an incalculable number of potential combinations of these in the country, it is not possible to cater for all commercial situations. However, the principles that are being demonstrated are applicable to most production systems. The research demonstration farm will entail ~120 spring-calving suckler cows comprising four breed types (with 30 cows per breed), these being: firstly, Limousin × Holstein-Friesian, secondly, Limousin × Simmental, thirdly, Charolais × Limousin, and, fourthly, Charolais × Simmental, all of known genetic merit, mated to high genetic merit, late-maturing sire breeds, producing progeny to slaughter on predominantly grass-based, calf-to-beef systems operated at a relatively high stocking rate (>220 kg organic Nitrogen/ha).

Breeds and Breeding Policy

At the end of 2008 and in early 2009 breeding heifers (~12 to 24 months of age) were identified with the assistance of the Irish Cattle Breeding Federation (ICBF) and then purchased on-farm. They arrived at Grange Beef Research Centre between early February and late March 2009 and following bio-security procedures were integrated into the herd.

The cow breed types selected broadly represent about two-thirds of the suckler “cow types” in the country and also the main replacement breeding strategies available to farmers i.e. sourcing replacement heifers from the dairy herd (i.e. Limousin × Holstein-Friesian) or from the suckler herd (i.e. Limousin × Simmental, Charolais × Limousin and Charolais × Simmental) (Table 1). The breeds correspond to over 80% of sires bred to suckler cows, nationally.

The Limousin × Holstein-Friesian was chosen as a benchmark breed, because this is the optimum “cow type” in all breed comparisons carried out at Grange to date. By this we mean, a “cow type” with moderate feed intake and producing progeny with (i) a higher passive immunity (ability to fight-off disease) due to higher colostrum production of the dam, (ii) a higher weaning weight due to higher milk production of the dam, (iii) higher carcass weight per day of age, mainly due to higher pre-weaning growth and (iv) good carcass (conformation and fat score) characteristics.

At purchase, the mean suckler beef value (SBV) of the Limousin × Holstein-Friesian was 81, whereas, that of the three late-maturing “continental” crossbreeds was ~130 (Table 1). The latter value represented the top 5 to 10 % for commercial beef animals. Mean reliability of the SBV was 30%.

Table 1: Cow breed type, suckler beef value (SBV) at purchase and replacement breeding policy.

Cow breed types	Grange tag colour	SBV at purchase	Source of replacements
Limousin × Holstein-Friesian (LF)	Blue	81	Dairy Herd Suckler Herd
Limousin × Simmental (LS)	Orange	131	
Charolais × Limousin (CL)	White	130	
Charolais × Simmental (CS)	Green	134	

The breeding policy will exploit breed differences and hybrid vigour or heterosis (advantage to crossbreds over the average of the parent breeds). The advantages of hybrid vigour from crossbreeding are due to a combination of; enhanced reproductive performance, lower calf mortality and higher calf growth. This is the reason that the four cow breed types are all cross-bred. Research shows that the advantage expected from using a cross-bred suckler cow as opposed to a purebred in terms of kg of calf weaned per cow put to the bull is about 13%. In addition, using a sire from a third breed increases the weight of calf weaned per cow put to the bull by approximately a further 8 %. This is the reason that “non-related” terminal sire breeds (Blonde d’Aquitaine in year 1 (2009) and Belgian Blue in year 2 (2010)) were used (Table 2). The use of a non-related terminal sire breed will also facilitate a valid comparison of the four cow breed types.

Table 2: Cow breed type and breeding programme

Cow breed types	Sire breed (2009)	Sire breed (2010)	
	Terminal 100%	Maternal ~50%	Terminal ~50% (100%)
Limousin × Holstein-Friesian	Blonde d’Aquitaine	-	(Belgian Blue)
Limousin × Simmental	Blonde d’Aquitaine	Simmental	Belgian Blue
Charolais × Limousin	Blonde d’Aquitaine	Limousin	Belgian Blue
Charolais × Simmental	Blonde d’Aquitaine	Simmental	Belgian Blue

Where replacements are retained within the herd the sire breed (bulls primarily selected on the basis of good maternal traits) used this year (2010) on the Limousin × Simmental and Charolais × Simmental cows are Simmental and on the Charolais × Limousin cows, Limousin (Table 2). To produce the next generation of replacements from these female progeny, the other sire breed within each cow genotype will be used. This two-breed rotation (criss-cross) is a relatively simple breeding programme and maintains about two-thirds of the level of hybrid vigour identified earlier. Consequently, this herd will evaluate and demonstrate to suckler beef producers the merits of alternative replacement breeding strategies and additionally, over time, the new economic breeding index or SBV for suckler cows will be evaluated.

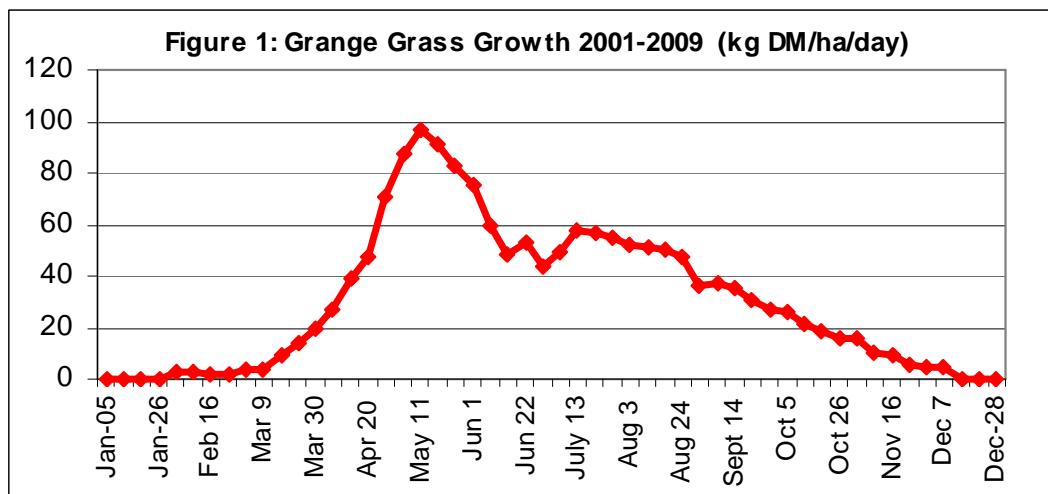
It is important to bear in mind that all these cows are presently first-calvers and consequently, all else been equal, performance will be lower than in a “mature” cow herd e.g. higher calving problems and higher calf mortality; lower immune status and lower pre-weaning growth in calves due to lower colostrum and milk yield, respectively, of the dam.

Production System

The herd will operate as a high stocking rate, spring-calving, grass-based calf-to-beef production system. Economic analysis of calf-to-beef production system comparisons at Grange (e.g. 210 vs. 170 kg organic Nitrogen/ha) has shown that where individual animal performance remains high, stocking rate is the main driver of farm profitability. Consequently this system will be operated at a stocking rate of ~225 kg organic Nitrogen /ha or ~2.9 LU/ha.

Mean calving date will coincide with the start of the grass growing season. Research at Grange has shown that in general, earlier calving and turnout to pasture improves farm net margins by reducing the proportion of more expensive grass silage (and concentrates) in the annual feed

budget and replacing it with cheaper grazed grass. Furthermore, slurry handling costs are reduced. However, earlier calving and turnout will only increase farm net margin where an adequate supply of grass is available and grazing conditions are suitable to facilitate this – in other words, the optimal calving date is directly related to the start of prevailing grass growing season. Whilst grazing conditions are largely dependent on the prevailing soil, climatic and weather conditions and is, therefore, largely outside the farmer's control, farmers can have an influence on pasture availability in spring by appropriate autumn grassland management and judicious application of N fertiliser. Furthermore, higher ryegrass proportion will promote earlier spring growth. In Grange, grass growth generally commences about mid-March, although this varies from year to year (Figure1).



The male progeny will be produced as bulls at ~18 months of age and heifers at ~20 months of age. The diet of the spring-calving cow is confined to grazed grass or moderate digestibility (67% DMD) grass silage (plus minerals/vitamins) with the exception of first-calving animals who additionally receive 2.0 kg of concentrate from calving until turnout to pasture. The only concentrates offered to calves pre-weaning will be that required under the Suckler Welfare Scheme. At the end of the first grazing season the weanling progeny will be housed indoors and offered high digestibility (75% DMD) first harvest grass silage *ad libitum* plus 1-2 kg of concentrate per head per day. The objective is to grow the animals at ~ 0.6 kg per day and avail of compensatory growth during the subsequent grazing season. At the end of the first winter they will be turned out to pasture (early-mid March) and rotationally grazed. Bulls will be housed after about 3 months (~mid-June) and finished on a high concentrate diet over 90 days. Heifers will be housed around mid-September and finished indoors over 60 days on grass silage *ad libitum* plus 3 kg of concentrate per head per day. Target live weights at weaning, yearling and slaughter (~20 mths) for heifer progeny of a “mature” cow herd are, ~295 kg, ~375 kg and ~565 kg, respectively. Corresponding values for bull progeny are ~320 kg, ~400 kg and ~665 (~18 mths) kg. Target carcass weights are ~310 kg for heifers and ~390 kg for bulls.

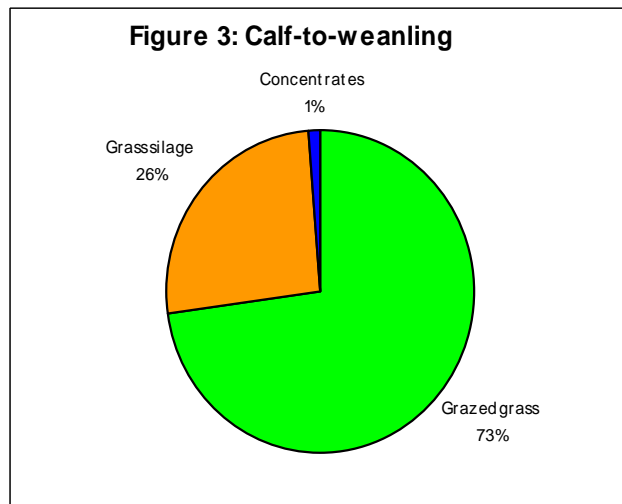
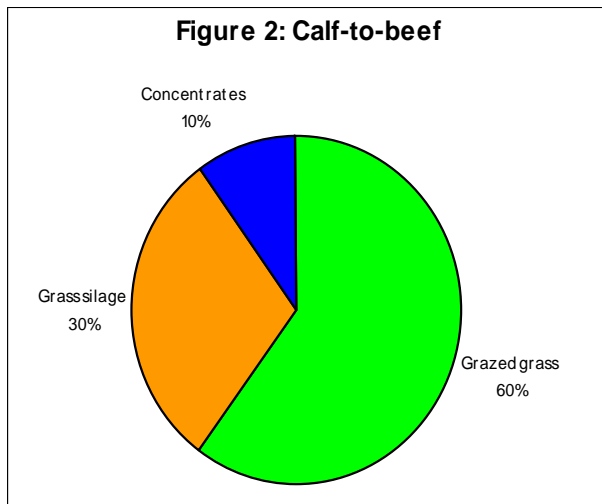
Grassland Management

Due to the considerably lower comparative cost of grazed grass as a feedstuff, maximising the proportion of high digestibility, grazed grass in the annual feed budget, while simultaneously achieving high animal performance and providing sufficient grass silage of appropriate digestibility for the indoor winter period, is central to the production system. Mean fertiliser nitrogen (Urea or CAN) application will be ~ 200 kg N/ha per annum.

Grassland management revolves around a flexible rotational grazing system, with the objective of providing high nutritive value grass – leafy swards of high digestibility. This entails, grass budgeting

with target farm covers as well as target pre- and post-grazing herbage yields and closing dates, and a reseedling programme targeting at lower yielding paddocks. In terms of grass conservation, a 2-cut silage harvest system will be operated with the objective to produce high nutritive value first-harvest grass silage for the progeny (75 % DMD) and moderate nutritive value silage for the cows (67 % DMD).

The annual feed budget of the calf-to-beef system will comprise approximately 60% grazed grass, 30% grass silage and 10% concentrates (Figure 2). The calf-to-weanling component will comprise approximately 73% grazed grass, 26% grass silage and 1% concentrates (Figure 3). Obviously, these proportions are largely constrained by the prevailing environment, as dictated by geographical location, climate/weather, soil type etc. and thus, will differ accordingly.



The research demonstration programme on the farm is evaluating strategies to further increase the proportion and nutritive value of grazed grass consumed annually. These involve 1) early turnout to pasture, including “on-off” grazing and 2) a comparison of two (4.0 and 6.0cm) post-grazing sward height systems.



The *Derrypatrick Herd*, Grange – performance to date

William Minchin, Mark McGee and Paul Crosson

Livestock Systems Research Department, Animal & Grassland Research and Innovation Centre, Teagasc Grange

Production System – 2009

Breeding

The breeding heifers, comprising of four breed types (Limousin × Holstein-Friesian (LF), Limousin × Simmental (LS), Charolais × Limousin (CL), and Charolais × Simmental (CS)), ranged in age from 12 to 24 months when they arrived at Grange (March). The 2009 breeding season commenced on April 29th and finished on July 15th (11 weeks). The breeding period was designed to allow mean calving date coincide with the start of the grass growing season. The heavier heifers (>380 kg live weight) were synchronized (two administrations of prostaglandin (PG) at an 11-day interval) and inseminated on the basis of a detected heat. Those not synchronized were inseminated on detection of natural heat. Blonde d'Aquitaine sires were used. Using the “non-related” third sire breed (not present in the breed composition of the four heifer types) allows hybrid vigour to be maximised and further allows the valid comparison of the four cow breed types. Two artificial insemination (AI) bulls (Wiveton Indiana (WTI) and Ganaway Jasper (GWJ)) were selected primarily on the basis of low calving difficulty (PD <4.0 %) and high (5 star) beef carcass index (BCI). The two sires were randomised across the four genotypes. Following three cycles of AI, two stock bulls (both sired by Landais (LSX)) were used. Scanned pregnancy rate was 94%, mean expected calving date was March 12th, with a calving spread of 11 weeks.

Grassland management

In 2009 the heifers were rotationally grazed in four groups of 34 on 40 ha, equivalent to a relatively high stocking rate of 195 kg organic nitrogen per hectare. Two post-grazing sward height systems - 4.0 and 6.0cm were evaluated. The mean pre-grazing herbage mass was 1920 kg DM/ha and pre-grazing sward height was 10.4cm. Animal performance for the four heifer breed types and the two grazing systems is summarised in Table 1. The LF heifers were lightest and CS heifers heaviest with LS and CL intermediate. Live weight gain over the grazing season was not significantly different between the breed types. There was no significant difference in animal performance between the two grazing systems. However, in terms of grassland, an additional 20 tonnes DM of surplus grazed grass (26 v. 6 t DM) was removed (as baled silage) from the 4 cm system compared to the 6 cm system. This result indicates that potential exists to increase herbage production by grazing to a lower post-grazing residual height without sacrificing animal performance. These target post-grazing stubble heights are still under evaluation.

Table 1: Performance of four heifer breed types on two grazing management systems

	Heifer breed type				Grazing system	
	LF	LS	CL	CS	4 cm	6 cm
Initial live weight (kg)	419	453	451	470	449	447
Final live weight (kg)	569	595	585	612	588	594
Daily live weight gain (kg)	0.68	0.65	0.61	0.65	0.63	0.67
Initial body condition score (BCS) (0-5)	3.04	3.18	3.16	3.23	3.15	3.16
Final BCS (0-5)	3.26	3.20	3.26	3.22	3.22	3.25
BCS change (0-5)	0.22	0.02	0.11	-0.01	0.07	0.10

LF = Limousin × Holstein-Friesian; LS = Limousin × Simmental; CL = Charolais × Limousin; CS = Charolais × Simmental.

Reseeding pasture

Eighteen percent (~7 ha) of pasture was reseeded on September 14th 2009. Four varieties were sown as monocultures in combination with 10% clover (Crusader). Two tetraploid (Aston Energy and Bealey) and two diploid (Abermagic and Tyrella) varieties were sown. These varieties are currently under evaluation. It is envisaged that between 10 and 15 % of the farm will be reseeded annually with lowest yielding paddocks targeted.

Winter 2009 – Spring 2010

Winter feeding and calving

In mid-November all heifers were housed indoors on slatted pens. For the first part of the winter, they received grass silage (68% DMD) *ad libitum* and intake was recorded during this period. One month pre-calving 30% straw was included in the diet. Dry cow minerals were offered daily. Two to five days prior to expected calving, heifers were removed from the slats to individual straw bedded calving pens. After calving, they were offered 2 kg/day of concentrate (as they were first calvers) in addition to grass silage *ad libitum* until turnout to pasture. They remained in the calving pens for a number of days to encourage bonding with the calf. The cow and calf then moved back to the slatted pens where the calves were held in a separate creep area at the back of the pen. Calves had twice daily access for suckling. Calving commenced on February 12th 2010 and finished on May 4th, with a mean calving date of March 12th. Calving performance is summarised in Table 2.

Table 2: Calving performance in Year 1 (first-calvers)

	Number
Cows calved	121
Live calves	112
Set of twins	2
Stillborn	5
Death following caesarean section (1-24 hrs)	2
Accidental death (standing/lying on calf)	3
Scour (2 months old)	1
Mortality to date (%)	9

Live weight, body condition score (BCS), silage dry matter intake and calving difficulty of the four heifer breed types, and birth weight and growth of their calves is shown in Table 3. In general, LF heifers are lightest and CS heaviest with LS and CL intermediate. Although BCS did not differ between the heifer breed types at the start of the winter, it is now (June) lower in LF than the other three breed types. Silage dry matter intake (kg/day), calving difficulty score or calf birth weight did not differ significantly between the heifer breed types. Calf average daily live weight gain from birth to ~June is highest for LF and lowest for CL, with LS and CS intermediate.



Table 3: Intake and performance of the four cow breed types and growth of their calves

	Cow breed type			
	LF	LS	CL	CS
Live weight (kg)				
Housing (mid-Nov)	577	588	598	621
Post-calving	563	584	586	599
June (kg)	518	570	572	581
Body Condition Score (0-5)				
Housing (mid-Nov)	3.3	3.3	3.2	3.2
Post-calving	2.9	3.1	3.0	3.0
June	2.8	3.0	3.0	3.0
Silage dry matter intake (pregnancy) (kg/day)	6.7	7.1	7.2	7.2
Calving difficulty score (1-5)	1.88	1.92	2.21	1.88
Calf birth weight (kg)	44.6	42.5	42.8	44.3
Calf average daily gain: Birth to June (g)	968	911	789	876

LF, Limousin x Holstein-Friesian; LS, Limousin x Simmental; CL, Charolais x Limousin; CS, Charolais x Simmental.

Breeding

The breeding season for 2010 started on April 26th and will continue until July 10th (11 week calving window). Vasectomised bulls with chin balls, in conjunction with tail paint, are being used as heat detection aids. For the current breeding season, ~50% of LS, CL and CS cows will be bred to (AI) maternal sires to produce replacement heifers, with the remaining ~50%, and all of LF, bred to a terminal sire breed (Table 4). The maternal sire breeds (AI code) being used are Limousin (NIU and ORO), Simmental (KFY and HCJ) and the terminal sire breed is Belgian Blue ((AVD) plus stock bulls). Within breed, the maternal sires were primarily selected on the basis of good maternal traits ("Replacement value" – daughter milk & fertility) but also on calving ease and beef carcass index (BCI). The terminal sire was primarily selected on the basis of calving ease and BCI. Again using a breed (Belgian Blue) not present in the maternal genotype pool will allow us to maximise heterosis and to continue a valid comparison between the cow breed types (i.e. avoiding confounded results caused by heterosis). Using Belgian Blue also means that the progeny produced should meet the requirements for the higher priced European continental markets i.e. lean carcass of good conformation.

Table 4. Breeding policy in 2010 for the four cow breed types

Cow breed type	Maternal Sire	%	Terminal Sire	%
Limousin x Holstein-Friesian	-	0	Belgian Blue	100
Limousin x Simmental	Simmental	50	Belgian Blue	50
Charolais x Limousin	Limousin	50	Belgian Blue	50
Charolais x Simmental	Simmental	50	Belgian Blue	50

Early turnout to pasture

Due to the considerably lower cost of grazed grass compared to grass silage and concentrates, maximising the proportion of high digestibility, grazed grass in the annual feed budget, is central to the production system. Underpinning this is an extended grazing season via earlier turnout to pasture in spring, by incorporating "on-off" grazing techniques. Previous research at Grange showed that allowing yearling cattle and mature lactating suckler cows restricted daily access to grazed pasture is a practical strategy to permit early-spring grazing.

This spring a study was carried out between March 1st and April 1st to evaluate and demonstrate this practice further. It compared, 1) cows indoors fulltime offered grass silage + 2 kg of concentrate daily, 2) cows “on-off” grazing (offered 20% of total dry matter intake as grass silage + 2 kg concentrates plus 6 hours access to pasture daily in one bout), and, 3) cows (+ calves) outdoors fulltime. To prevent grass tetany, cows on the “on-off” grazing treatment received Cal Mag daily on their silage and those outdoors fulltime were offered high magnesium buckets. For the “on-off” grazing treatment, calves remained indoors and, as per those indoors fulltime, had twice-daily access to their dams for suckling. Consistent with previous findings, preliminary results to date show highest growth rates in calves from cows turned out fulltime and lowest growth rate in calves from cows inside fulltime, with calves from cows “on-off” grazing being intermediate during this period. However, previous research has shown that these differences may diminish due to subsequent compensatory growth in the slower growing calves.

Ground conditions were good for grazing, but due to very cold weather, grass supply was severely limited. The ensuing extremely wet weather and snow at the end of March meant that all animals were re-housed for one week before turnout again. Grass growth on the farm only commenced in the first week of April, approximately 2 weeks later than normal. The second grazing rotation began on April 22nd. Fifty-five percent of the land area was closed for silage harvesting (1st cut) with a planned 38% for 2nd cut. The two post-grazing sward height systems (4 cm and 6 cm) are being compared again this year with first-calving cows and their calves.

Animal health

On arrival in 2009, all heifers were tested for bovine viral diarrhoea (BVD), Johnes and Neospora, and vaccinated against BVD, respiratory syncytial virus (RSV), parainfluenza-3 (PI-3) virus, infectious bovine rhinotracheitis (IBR), Salmonella and treated for internal and external parasites.

4 weeks pre-breeding cows were vaccinated against Leptospirosis and BVD. They received an IBR vaccine twice annually and were also vaccinated between 12 and 3 weeks pre-calving for E coli, rotavirus and coronavirus (calf scours). Calves received an IBR and RSV intranasal vaccine 2 weeks after birth plus a booster 12 weeks later. Some isolated incidences of scour and pneumonia in calves have been encountered but nothing noteworthy. Pre-weaning, calves will receive a vaccine against respiratory disease. Treatment for internal and external parasites (stomach worm, lung worm, fluke, lice) will be implemented.

See Grange website for background and weekly updates:

<http://www.agresearch.teagasc.ie/grange/researchfarms>



Producing high quality pastures for beef

Edward O’Riordan, Pearse Kelly² and Adrian Van Bysterveldt³

Animal & Grassland Research and Innovation Centre, Teagasc, Grange

² *Beef Specialist, Teagasc, Kildalton*

³ *Animal & Grassland Research and Innovation Centre, Teagasc, Moorepark*

Introduction

In terms of grass growth and pasture utilisation, the year to date, has been remarkable by many standards. Beginning with the remarkably cold weather in February and March which led to many pastures being denuded of grass, where covers were reduced by up to 300 kg DM/ha from their early winter closing covers. This was followed by a period of poor grass growth which was, generally, accompanied by very favourable grazing conditions. On many farms, while grass supply has remained tight for most of April and into mid-May, sward utilisation has been excellent and all the early indications are that animal live weight gains have been satisfactory. As we approach mid-June grassland and grazing management decisions made now can have a major impact on grass growth and quality for the remainder of the year. Many farmers who turned out cattle early, by firstly grazing some grazing fields and the silage ground, are aiming to achieve live weight gains of 1.2 to 1.5 kg/day from grazed grass up to late June. In order to achieve high live weight gains for the remainder of the grazing season, the focus of pasture management must be to maintain grazed swards with a high nutritive value and this is largely achieved through maintaining a high proportion of green leaf in the sward. Pre-grazing herbage mass (pasture cover) is a major factor affecting pasture leaf content.

Target Grass Covers

Pre-grazing herbage levels control pasture quality and post-grazing herbage residuals regulate animal intake. Therefore, the simplest and most effective way of achieving high quality pastures is to maintain optimum levels of pre-grazing and post-grazing pasture yields. Average pre-grazing pasture cover targets to control average pasture cover and quality throughout the year are suggested in the table below.

Table 1: Target pasture covers (above 4 cm) levels for beef cattle.

	Pre-grazing yield (kg DM/ha)	Post-grazing yield (kg DM/ha)	Average pasture cover (kg DM/ha)
Early spring (Feb – Apr)	1000-1500	100-200	400-600
Late spring to summer (May – Jun)	1300-1800	200-400	500-800
Mid-Summer to autumn (Aug- Oct)	1600-2500	350-450	700-900
Early winter (Oct – housing)	1200-1800	0-100	700-800

In late spring/early summer the aim is to keep pre-grazing covers between 1200 to 1800 kg DM/ha within a 20-25 day grazing rotation. When pre-grazing yields start to exceed 1800 kg DM/ha, paddocks are removed from the grazing rotation (as silage). The average cover of the grazed pasture changes very little from late spring to autumn when the pre-grazing and post-grazing pasture cover targets are maintained. However, in May to June, when grass growth rates are usually at their peak (see Figure 1) and when pastures are capable of supporting high stocking rates, many farms make the mistake of allowing pre-grazing yields (and covers) to increase to a point where pasture utilisation is poor and as a result the content of leaf decreases and stem and dead materials increase in the sward. Sward digestibility is decreased and animal performance is depressed. The waste of a valuable feed resource occurs and this waste has an impact on subsequent grass growth, pasture quality and animal performance. Swards which have the potential to achieve live weight gains of over 1 kg in the mid-summer to autumn period are often

only supporting gains of not much more than 0.5 kg/head/day. This loss in performance is nearly all due to poor grassland management.

Managing Leaf to Stem Ratio

Grass species and cultivars often differ in nutritive value, which is usually associated with changes in their leaf to stem or green to dead matter ratios. Flowering stem (i.e. forming seed heads) has a high lignin content, which limits the nutritive value of grasses, because of its low dry matter digestibility (DMD) and its resistance to breakdown in the rumen. Dead matter is of low DMD, so the amount of dead matter is an important determinant of pasture quality. There are relatively minor differences in the DMD of green leaf between temperate grass varieties. Therefore, pastures are grazed to a low residual cover in April – May to reduce flowering stem and dead matter.

Measure pasture yield and quality

Maintaining target pasture quality requires an ability to assess pasture growth rates and pasture covers either by cutting, visual estimates or by using techniques such as a rising plate meter. The accuracy of the visual and plate meter methods relies on accurate and frequent calibration. The routine collection of measured pasture growth rates combined with pasture composition and plate meter measurements at Grange provides the opportunity to improve calibration equations for use on beef pastures.

A rapid and cheap assessment of pasture quality requires knowledge of the species and morphological components of the sward.

Incorporate legumes

The amount of legume in a pasture affects its production and quality. Legumes such as white clover and red clover are usually higher in DMD and protein than grasses because of their different make-up. They also have a higher leaf to stem ratio and a lower green to dead matter ratio than grasses. In addition, root nodule bacteria, or rhizobia, living in nodules on the roots of legumes, supply N for pasture growth.

The high nutritive value of white clover results in increased DM intake and live weight gain by cattle compared to ryegrass grown in the same conditions. Over a number of years, grazing studies at Grange have recorded additional live weight gains of over 3-5% from swards containing white clover. The trials showed that well managed white clover based swards receiving only 50 kg N/ha in spring are capable of producing equivalent animal output as ryegrass swards getting 200 kg N/ha.

The seasonal growth patterns of perennial grass species and white clover somewhat complement each other. This synergy is the main reason for seasonal changes in white clover content in a pasture. For example, a pasture may contain less than 10% of white clover in April/May when most grass species are growing at a faster rate during the early flowering phase. However, the same pasture may contain over 50% white clover in July/August when the growth rates of the grasses have declined after their spring peak and white clover is now growing at its maximum rate.

Reseeding or over-sowing?

Increasing the white clover content in pastures should be a primary objective on all Irish beef farms. As a general rule, the pastures selected for reseeding with white clover and perennial ryegrass should be those which have low amounts of both species but have the greatest production potential and the lowest cost of renewal.

Pastures with a reasonable amount of perennial ryegrass but little or no white clover could be suitable for white clover over-sowing. White clover establishment from seed over-sown into an

existing pasture is clearly more variable than from a well-prepared seed bed. However, the chances of establishing a good population of white clover are improved by reducing grass competition and promoting clover growth. Both requirements can be achieved by over-sowing after (heavy) silage cut and not applying any N fertiliser to the re-growing sward. It remains to be clarified how coated or uncoated seed affect white clover establishment in semi-intensive grassland.

For both methods, the first grazing following reseeding is timed when the sward has produced a complete canopy of leaves and when all seedlings pass the finger-and-thumb pull test. That is, when the leaves of the seedlings can be removed by the finger and thumb (simulating grazing) without pulling the seedling from the soil.

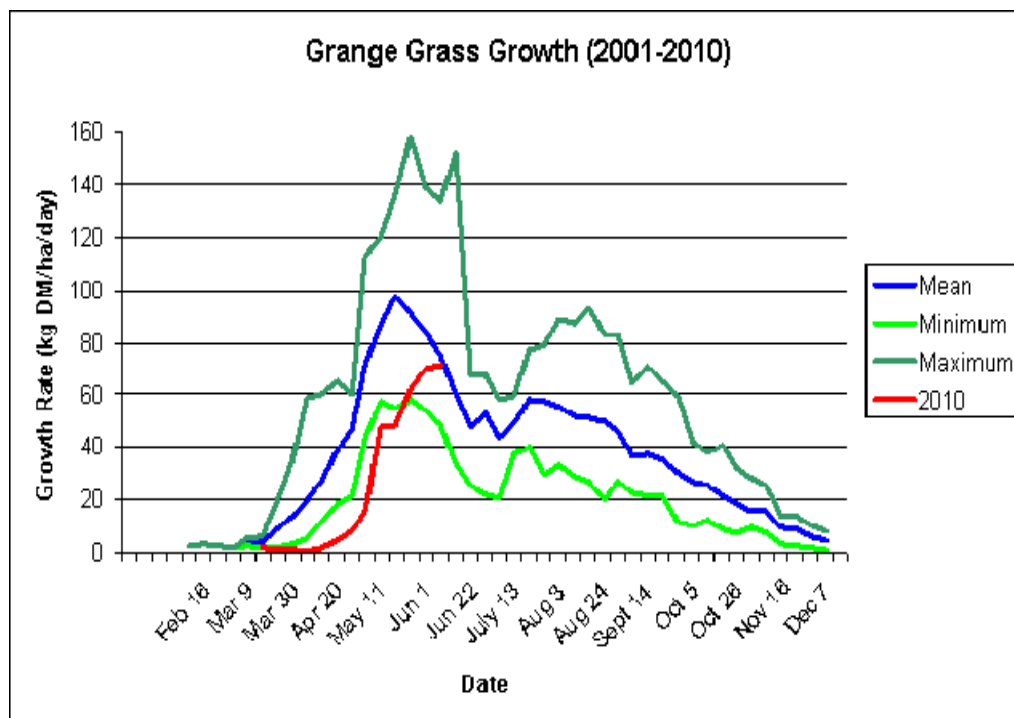


Figure 1. 10 years mean, minimum and maximum and 2010 grass growth for Teagasc, Grange



Steps towards the efficient use of AI in suckler beef herds

Michael G. Diskin¹ & Tom Colf²

¹Animal & Grassland Research and Innovation Centre, Teagasc, Mellows Campus, Athenry, Co. Galway.

²B&T Adviser, Teagasc, Mohill, Co. Leitrim.

Quality Replacements

It is strongly recommended that beef farmers should develop a specific breeding programme to produce quality herd replacements. At least half of the herd should be bred to produce such replacements and the remainder bred to terminal beef sires. For most herds this inevitably means the use of AI unless herd size is big enough to justify more than one breed of natural service sire. The successful use of AI is primarily dependent on both the accuracy of and ability to detect cows in heat. Producers are advised to use AI at the beginning of the season and use it until such time that sufficient cows are bred to produce the required number of replacements.

The efficient use of AI has the potential to increase the productivity and profitability of beef herds by 1) the production of faster growing calves from genetically superior sires, 2) the selective mating of cows and or heifers to selected sires, 3) minimising the risk of bull infertility, and, 4) removing a hazard of having a bull from the farm,

However, the potential productivity and profitability gains can easily be dissipated unless AI is used efficiently.

The following steps are important to ensure the successful use of AI at Farm Level.

Understanding the factors affecting the expression of heat.

Numerous factors affect the expression of heat, the more important of which are:

Housing arrangement: For satisfactory expression of heat cows must have adequate space to allow cow-to-cow interaction. If the stocking density indoors is too high the expression of the signs of heat are reduced, consequently making detection more difficult. Also, if the stocking density is too high it is likely that there will be an increase in the erroneous identification of cows that are not in heat.

Floor surface: Cows dislike being mounted while standing on concrete and have a preference for softer underfoot surfaces such as grass, dirt or straw bedded yards. Mounting activity is reduced by almost 50% when cows are on concrete as opposed to softer underfoot conditions while the duration of oestrous activity is reduced by about 25%. Cows distinctly dislike being mounted by herd mates if the floor surface is either slippery or very coarse.

Feet and leg problems: Cows with sore feet or legs or that have poor structural conformation exhibit less mounting activity and have fewer “stands”. Furthermore, such cows may well stand to be mounted when not in heat because it is too painful to escape from the mounting cow.

Status of herd mates: The number of cows in heat simultaneously has a major impact on overall heat activity and on the average number of mounts per cow. The number of mounts per cow increases as the number of cows simultaneously in heat (up to about 3-4 cows in heat) increases. In smaller and even in larger herds as more cows become pregnant, the likelihood of more than one cow being on heat on any given day is less, thus, making heat detection more difficult.

Understanding the signs of heat

Primary sign of heat: Standing to be mounted by herd mates or bull is the most definite and accurate sign that a cow is in heat. Cows that move away quickly when a mount is attempted are not in true heat.

Secondary signs of heat: Because standing heat may not always be observed then other, secondary, signs that a cow is in heat must be called upon in making a decision as to whether or

not to inseminate a cow. These secondary signs of heat may indicate that a cow is coming in heat, in which case closer attention should be given to her over the following 48 hours, or they may be indicative of a recent heat in which case she should be given close attention 17-20 day later. Indicators to look for are:

- Discharge of clear mucus: The passing of long clear elastic strings of mucus is indicative of an imminent heat while a thicker cloudier and more viscous mucus is indicative of a recent heat.
- Mounting other cows. Cattle that mount other animals may be in, or approaching heat. Generally, cows that are at the mid-cycle stage of their oestrous cycles or that are in-calf perform mounting activity much less frequently.
- Restlessness: Signs of restlessness such as increased walking, trailing of other cows and bellowing are characteristic of individual cows that are either approaching or are in heat.
- Swelling and reddening of vulva: Hormonal changes associated with heat cause an increased blood supply to the reproductive organs which in turn causes swelling and reddening of the vulva.
- Hair loss and dirt marks: As a result of frequent mounting by herd mates, the hair on the tail-head is usually removed and the skin on either side of the tail-head is often scarred and dirty. This is indicative that the cow was recently on heat.
- Blood stains on the tail or vulval area (metoestrous bleeding): These are indicative of a recent heat. Such animals should be watched closely for heat 17-20 days later.

Use an Aid to improve heat detection

Vasectomised bulls with chin-ball marking harness: Active vasectomised teaser bulls are useful in identifying cows either coming into or on heat. Bulls should be fitted with a chinball harness (available from Co-Op and Veterinary stores) 2-3 weeks before turn out with the herd. Teaser bulls require the same management as entire bulls and should be either castrated or disposed of after one season.

Steers: If recently castrated, they are useful in identifying cows coming into or in heat.

Heat detection patches: Recently a number of “scratch card-type” patches have come on the market, including Estrus Alert ® and ESTROTECT™. These are affixed to the cow’s tail head. Friction from mounting activity rubs off the silver coating to reveal a bright colored patch underneath. These devices, when properly applied, are very useful as an aid to heat detection. They cost between €1.50 and € 2.00 per patch.

The use of either a teaser bull, recently castrated steer or a heat detection patch will increase the detection rate and also reduce the duration of each observation period and the number of observation periods from 3 time daily to twice daily that cows need to be checked. Spend a minimum of 20-30 minutes observing them during each observation period. Disturb the cows and carefully check and record cows that are sliming or exhibiting any signs of restlessness as there are important secondary or indicator signs of an imminent heat. Early morning and late evening are critical times to check cows.

Timing of A.I:

In cattle ovulation generally occurs 28 to 36 hours after the onset of heat. However, late insemination, at 24 hours or later, after onset of standing heat, should be avoided.

Use funnel to remove cows from paddocks for AI.

Poor farm layout, inadequate facilities, lack of labour availability combined with the difficulty of removing an individual cow(s) (and her calf) from the herd for AI all militate against the use of AI. In Teagasc we have found that the use of a temporary fence, possibly an electric, to funnel cows towards the gate and roadway (Fig. 1) is an excellent way of easily removing an individual cow from the herd for AI. Currently this is used on many farms.

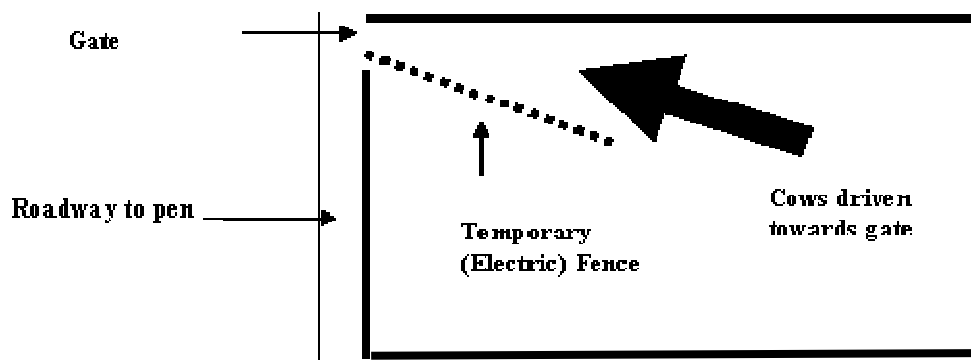


Figure 1. *The use of a temporary (electric) fence to assist getting beef cows out of a field.*

Good records and constant monitoring heat detection

Good breeding records are an integral part of breeding management. Submission rate is calculated as the proportion of cows calved at the beginning of the breeding season, that are intended for re-breeding and that are submitted for insemination. A submission rate of at least 80-90% should be achieved in the first 21 days of the breeding period. A submission rate of less than 80% indicates a problem with heat detection and diagnosis of this problem at such an early stage allows corrective action be taken before much of the breeding period has elapsed.

Commitment

Heat detection is the key to the successful use of AI. However, it is a repetitive, time consuming task. Where AI is the chosen method of breeding, farmers must be committed to heat detection, at least twice daily (early morning and late evening), for each day of the breeding season. In order to reduce the work time involved it is highly recommended that one of the aids described above is used.

Success rates with synchronization treatments

The expected conception rates vary from 30- 75%. It is best that:

- Cows are in a moderate BCS score (2.5 –3.0) at time of treatment. It is equally important that cows are a minimum of 35 days calved at time of PRID or CIDR insertion and are on a good plane of nutrition (plentiful supply of grass) for a minimum of 3-4 weeks prior to, during and after treatment.
- Synchronization should only be used in herds where the levels of management and in particular heat detection skills are high in order to detect heats and particularly repeat heats. Alternatively, a bull should be turned out with cows following the synchronized AI.



Aspects of animal health in suckler beef systems

Bernadette Earley¹, Mark McGee² and John Mee³

¹Animal and Bioscience Research Department, Grange, ²Livestock Systems Research Department, Grange, and ³Animal and Bioscience Research Department, Moorepark.

The objective of a well-designed herd health programme is to address multiple areas of management in order to reduce the likelihood of disease outbreaks and is a necessary component of suckler beef production if economic returns are to be realised. A herd health programme that includes bio-security, vaccination and the culling of carrier animals, drawn up in consultation with a veterinary practitioner, is the best way to address disease problems. A successful herd health programme for a specific herd must be re-examined on a regular basis, both to adjust for changes in herd management and to incorporate new information. Ongoing research continually improves our understanding of specific infectious diseases and management practices.

Prevention of disease

To ensure a healthy calf, the aim is to minimise the calf's exposure to disease, and maximise its defence against disease. In minimising a calf's exposure to disease, providing a clean, disease-free environment is fundamental. This involves:

- thorough cleaning and disinfection, before and during the calving season, of all areas used by calves,
- providing a clean, straw-bedded lying area with and good ventilation but no draughts,
- accommodating cows and calves in batches based on calving date so that young calves are never mixed with or accommodated in areas used by older calves,
- avoiding introduction of disease from sources such as purchased calves by isolating all purchased animals from young home-bred calves, and,
- maximising a calf's defence against disease,

In maximising the calf's defence against disease, control measures include:

- adequate nutrition of the pregnant cow, including feeding a suitable mineral supplement pre-calving,
- vaccination of cows for control of any organism(s) known to be responsible for infection on the farm in calves e.g. *E. coli*, rotavirus and coronavirus. In this respect, vaccination alone is not a replacement for good management, good hygiene or good bio-security. A veterinary practitioner should always be consulted with regard to specific health problems,
- disinfecting the calf's navel immediately after birth,
- ensuring that each calf receives sufficient colostrum (first milk) immediately after calving. Adequate intake of quality colostrum is one of the most important factors in ensuring survival and health of the calf. For suckler beef calves, research at Grange has shown that feeding the calf 5 % of its birthweight (e.g. ~2 litres of colostrum for a 40 kg calf), within 1 hour of birth with subsequent suckling of the dam 6 to 8 hours later ensures adequate passive immunity. Colostrum provides not only food but also maternal antibodies to protect the young calf against the common infections that it is likely to encounter in early life, and,
- regular temperature checking is useful to guide both diagnosis and observation of a clinical problem.

Calf scours

Scours are the main causes of calf mortality. The majority of calf scours are caused by six organisms: viruses such as rotavirus and coronavirus, bacteria such as *E. coli* and *salmonella*, and protozoa, such as cryptosporidia and coccidia. As outlined above, vaccination of the dam will help

reduce the probability of calf scours but cannot solely be depended upon for prevention. Furthermore, there are no vaccines available to combat protozoa. However, good hygiene and management practices reduces the likelihood of infection from cryptosporidia and coccidia.

Pneumonia

The underlying cause of pneumonia or bovine respiratory disease (BRD) is extremely complex with the involvement of viruses, bacteria and *Mycoplasma*. The incidence of infection is usually high, but the mortality rate is variable. The main viruses that cause outbreaks of pneumonia in calves are infectious bovine rhinotracheitis (IBR), respiratory syncytial virus (RSV), parainfluenza-3 virus (PI-3 virus), and bovine virus diarrhoea/mucosal disease (BVD/MD virus). These also occur in older cattle. Factors associated with susceptibility to pneumonia are; stress (disbudding, castration, weaning), overcrowding, inadequate ventilation, draughts, fluctuating temperatures, poor nutrition and/or concurrent disease. In most cases the main infective agent is a virus, which causes respiratory tract damage. This effect is worsened by *Mycoplasmas* and secondary bacterial infections (e.g. *Mannheimia* (*Pasteurella*) *haemolytica*). Viruses and *Mycoplasmas* are unaffected by antibiotics, however, antibiotic treatment is usually administered to kill off the secondary bacterial infections and offer the calf the opportunity to fight the disease. In order to direct the appropriate treatment strategy, nasal swabs should be submitted to the Regional Veterinary Laboratory for accurate identification of the pathogen(s) involved. Calves should be vaccinated where specific problems arise. Veterinary advice should be sought and the widest protection against pneumonia will be achieved where a vaccination programme includes the three most common respiratory viruses (IBR, RSV and PI-3) and the bacterial pathogen *Mannheimia* (*Pasteurella*) *haemolytica*.

Stomach worms, lung worms (hoose) and fluke

The two most important species of parasitic roundworms for grazing cattle are stomach worms (*Ostertagia*), which cause scouring, and lung worm (*Dictyocaulus*), which causes parasitic pneumonia (hoose). Both species overwinter on pasture and, therefore, can affect calves shortly after turnout. Animals affected with hoose have difficulty in breathing, develop a characteristic deep, husking cough and lose condition extremely fast. It is necessary to dose young calves with anthelmintics in their first summer at grass and again at the end of the grazing season – the specific timing of the treatment depends on the product used. Cows and yearling cattle that have previously been exposed to a low level of parasitic challenge can develop an effective immunity, but treatment may be required.

Liver fluke disease (Fasciolosis) is a common parasitic disease caused by *Fasciola hepatica*. The disease manifests itself mainly in two forms, acute and chronic. During wet summer conditions, grazing cattle ingest the intermediate stages of the fluke from contaminated pasture with invasion of the liver causing disease during the winter months. The major presenting clinical findings are persistent diarrhoea and chronic weight loss with resultant poor thrive. A control programme should include a flukicide treatment.

Diseases affecting Fertility

The introduction of diseases such as bovine viral diarrhoea (BVD), leptospirosis and neosporosis into herds can have a devastating effect on fertility. Veterinary advice should be sought.

Financial targets for the Derrypatrick Herd

Paul Crosson, Mark McGee and William Minchin

Livestock Systems Research Department, Animal and Grassland Research and Innovation Centre, Teagasc, Grange, Dunsany, Co. Meath.

Introduction

The primary objective of the Derrypatrick Herd is to maximise profitability from grass-based suckler calf-to-beef production systems. Given the relationship between profitability and output, high stocking rates, excellent levels of animal performance and the production of carcasses that meet the requirements of high-priced markets are essential. Since grazed grass is the cheapest feed available for Irish livestock systems, production systems and grassland management practices are operated which maximise, 1) the proportion of grazed grass in the total annual feed budget, 2) animal performance during the grazing season. The objectives of this article are to firstly, present the financial targets for the Derrypatrick Herd and to benchmark these targets against sectoral indicators and secondly, to outline and quantify the main drivers of profitability within grass-based suckler beef production systems with specific reference to the Derrypatrick Herd.

Financial targets for the Derrypatrick Herd

The targets set for the Derrypatrick Herd are substantially greater than those currently prevailing on Irish suckler beef farms. The overriding principle driving profitability is high levels of output within cost-efficient, grass-based systems of production. Thus, gross output is 233% and 160% that on the top third of Teagasc, National Farm Survey (NFS) and Teagasc, eProfit Monitor (ePM) farms, respectively (Table 1). Furthermore, although variable costs are greater for the Derrypatrick Herd, as a proportion of gross output they are considerably lower. Finally, target gross and net margin are much greater for the Derrypatrick Herd relative to NFS and ePM farms.

Table 1. Financial performance benchmarks for suckler beef production systems

	Teagasc NFS Top 1/3 ¹	Teagasc ePM Top 1/3 ²	Derrypatrick Target ³
Financial (€/ha)			
Gross output	772	1126	1,797
Variable costs	435	555	745
Gross margin	337	571	1,052
Fixed costs	407	514	479
Net margin	-70	57	576
Stocking rate (LU/ha)	1.70	1.95	2.88
Live weight output (kg/ha)	483	663	1036

¹2009 National Farm Survey; ²2009 eProfit Monitor; ³Targets set for the Derrypatrick Herd at 2010 prices

Maximising output

Output value is driven by stocking rate, calving rate, live weight per day of age and carcass value.

1. **Stocking rate.** The key driver of output on suckler beef farms is stocking rate. Where the level of production efficiency is maintained, increasing stocking rate will lead to a direct increase in farm profitability. Analysis at Grange has shown that, for the Derrypatrick Herd at current prices, each 0.1 livestock unit increase in stocking rate corresponds to an increase in gross and net margin of €33/ha and €26/ha, respectively, where stocking rate ranges from 1.9 LU/ha to 2.9 LU/ha. Based on this analysis, the stocking rate for the Derrypatrick Herd will be at the upper end of this scale.

2. **Calving rate.** The reproductive efficiency of suckler beef production systems can be ascertained by the calving interval and pregnancy rate. These parameters can be expressed in terms of the calving rate or number of calves per cow per year. A high level of reproductive performance is a critical element of profitable suckler beef production. For example, each additional percentage unit increase in calving rate corresponds to an increase in gross and net margin of €11/ha at current prices for the Derrypatrick Herd.
3. **Liveweight per day of age.** Target mean live weight per day of age for bull and heifer progeny in the Derrypatrick Herd is 1170 and 920g respectively. This target is important as it ensures beef output is high for a given age at slaughter. At a fixed stocking rate, age at slaughter will determine the number of cattle finished. To achieve target live weight performance levels, the suckler cow must have adequate milk yield, both the cow and terminal sire must produce offspring with high growth potential, and weight gain at grass and during finishing periods must be high. The implications of variations in live weight per day of age were investigated and showed that gross and net margin are increased by €30/ha for each 25 g/d increase in animal performance.
4. Whilst beef price is largely outside of farmers' control, there is some capacity to increase carcass value by improving **carcass grades**. Carcass conformation is somewhat influenced by feeding regime but is primarily related to breed-type. Therefore, the genetics of the dam and particularly the sire with respect to merit for carcass conformation is a critical element of the breeding programme. Carcass fatness is also influenced by genetics but is also largely determined by an appropriate feeding regime and therefore, farmers can have much greater control on this aspect of carcass grade in the short-term. Based on previous research carried out at Grange, mean expected carcass grade for bulls and heifers for the Derrypatrick Herd is R+3. The implications of varying mean carcass grade from R=4+ to U=3 were evaluated. This analysis indicated that, under the current pricing structure, gross and net margin would increase by 16% and 31%, respectively (Figure 1).

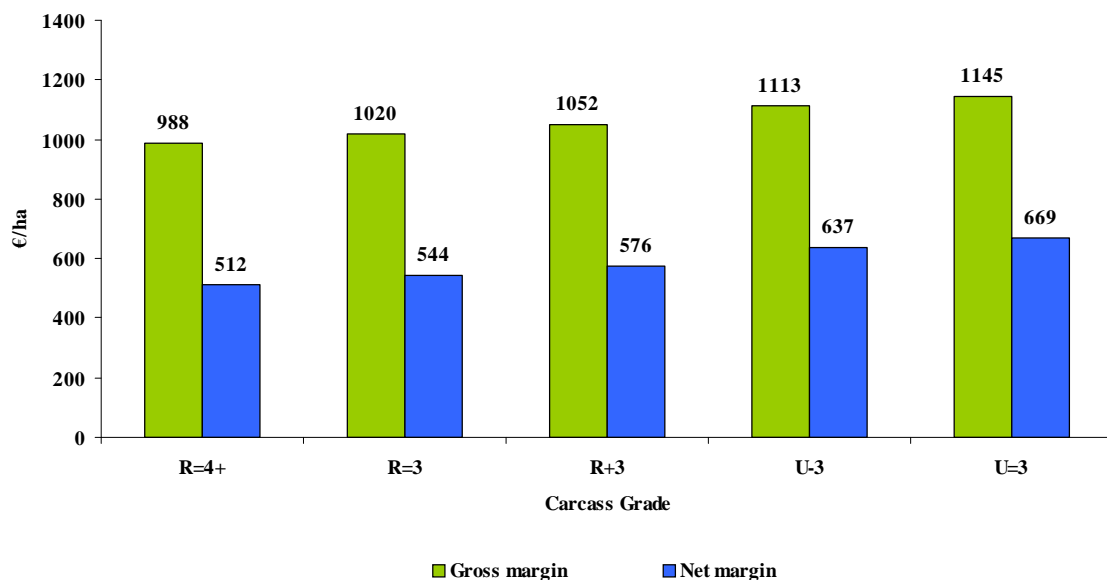


Figure 1. Implication of mean carcass grade on gross and net margin for the Derrypatrick Herd at current prices.

Cost of production

Maximising the quantity of grazed grass in the annual feed budget is critical to achieving the levels of cost efficiency required to meet the financial targets set for the Derrypatrick Herd. Grazed grass accounts for approximately 60% of the annual feed budget in the Derrypatrick Herd. Mean turnout date is mid-March and mean housing date is early November. The quantity of concentrates fed is low at 680 kg per cow unit. This is accomplished by (i) calving the herd in spring, to synchronize herd feed requirements with the grazing season, (ii) grass budgeting to identify, and respond promptly, to shortages or surpluses and (iii) planned closing dates to ensure adequate spring grass is available at turnout. Rotational grazing, feed budgeting, grazing to a predetermined residual sward height and reseeding of non-productive pastures ensure that leafy swards of high digestibility material are presented to the herd at all times. The objective is to ensure that the output targets outlined previously in terms of herd reproductive and live weight performance are achieved at least cost. The implications of a 6-week shorter grazing season relative to the current target for the Derrypatrick Herd were investigated and indicated that; i) grazed grass in the total farm feed budget reduced by 8% units, ii) variable costs increased by 13% and, iii) gross and net margin decreased by 9% and 8%, respectively.

Impact of herd parity and weanling price

The structure of the Derrypatrick Herd in 2010 is atypical in that all the cows are first-calvers. This has implications for calving difficulty, calf mortality, herd feed requirements and animal performance. In short, incidences of calf mortality and calving difficulty are greater for first-calvers relative to a multiparous cows as observed for the Derrypatrick Herd in 2010. Similarly, the present average daily gain of calves in the Derrypatrick Herd is consistent with previous research at Grange whereby the growth of progeny from first-calvers is lower than progeny from multiparous cows primarily due to the lower milk yield of first-calvers. As there are no yearling cattle in the herd to date, the system operated in 2010 will comprise the calf-to-weanling component only. The projected economics of this calf-to-weanling system for the current year were investigated. The analysis also explored the relative performance of a calf-to-weanling system for a mature herd where all other aspects of the production system (e.g. stocking rate, length of the grazing season, weanling age) remained constant. Finally, for both systems a range of weanling prices were evaluated given the vagaries of the live market (Figure 2). The results serve to highlight the importance of weanling price and correspondingly, the importance of calf quality (and weight) for suckler calf-to-weanling systems. It is also clear that the gross margin is greater for a mature herd than for a herd of first-calving cows.

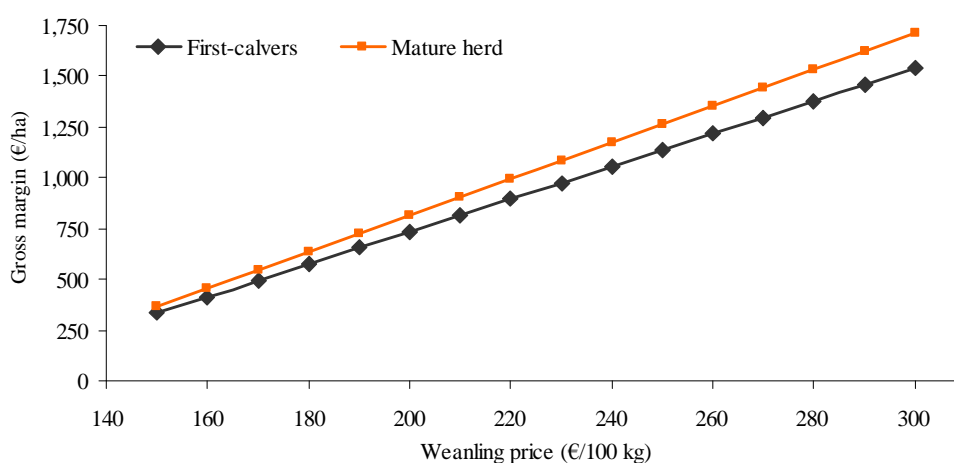


Figure 2. The impact of herd parity and weanling price on gross margin for suckler calf-to-weanling systems.

Dairy beef systems for steers and bulls

Gerry Keane¹, Edward O’Riordan², and Robert Prendiville³

¹Livestock Systems Research Department, Animal & Grassland Research and Innovation Centre, Teagasc, Grange

²Enterprise Leader, Animal & Grassland Research and Innovation Centre, Teagasc, Grange

³Livestock Systems Research Department, Animal & Grassland Research and Innovation Centre, Teagasc, Moorepark (based at Johnstown Castle, Wexford)

Targets for 21, 24 and 28 month steer systems

Production targets for spring-born 2 year-old steers have been widely published. Assuming a mean birth date of mid-March, weanling, yearling, store and slaughter weights for Holstein-Friesians are 230, 300, 490 and 620 kg, respectively. These are also applicable to early maturing beef cross Friesians with the exception that slaughter weight is about 40 kg lighter and slaughter age is about 6 weeks earlier. The corresponding target weights for continental x Friesians are 240, 320, 520 and 660 kg. Target carcass weights in 2 year systems for early maturing, Friesian and continental breed types are 300, 320 and 360 kg, respectively, based on kill-outs of 517, 516 and 545 g/kg. With careful selection for slaughter, no animals should be under 3 or exceed 4 in fat score. For conformation, the Holstein-Friesians should average “O”, the early maturing crosses should be $\frac{2}{3}$ “O” and $\frac{1}{3}$ “R”, while the continental crosses should be $\frac{2}{3}$ “R” and $\frac{1}{3}$ “O”.

To avoid the high costs of winter finishing, early maturing breed types can be slaughtered off pasture late in the second grazing season, and late maturing breed types can be stored over the second winter and finished off pasture in the third grazing season. For second autumn finishing, it is desirable that calves are born earlier than mid-March and are heavier in all phases of the production system. For finishing in the third grazing season continental cross animals can be later born than mid-March.

Targets for 12, 16 and 19-month Holstein-Friesian bull systems

Pure Holstein-Friesians together with both early and late maturing beef crosses are suited to bull beef systems and the proportional differences between breeds for steers apply also to bulls. In the interest of clarity only pure Holstein-Friesian systems are considered here. Because dairy farmers generally breed with Holstein-Friesian first and a beef breed after, pure Holstein-Friesian calves are earlier born which is particularly advantageous for bulls spending their first summer at pasture. A mean birth date of mid-February is assumed. Calf growth rate during rearing is 0.8 kg/day resulting in a calf live weight at 3 months of 110 kg. This is the starting point for the 3 systems described.

Cereal beef system

In this system the animals are housed throughout on *ad libitum* concentrates and slaughtered at about 12 months of age. For the first 6 months after the calf rearing stage, live weight gain is high at about 1.35 kg/day, giving a live weight of 360 kg at about 9 months of age. There may be a market for animals slaughtered at this age but kill-out will be low and carcass finish poor. After 9 months, live weight gain declines to about 1.1 kg/day and will continue to decline as animals get heavier. With weight gain declining and intake increasing, feed efficiency deteriorates rapidly. Choice of slaughter date is a compromise between the decline in feed efficiency and achieving acceptable carcass weight and finish. In a typical cereal beef system slaughter weight at about 12 months is 460 kg live weight. Kill-out is about 520 g/kg giving a carcass weight of 240 kg. Total concentrate input is about 1.9 t not including calf rearing.

15-16 month spring system

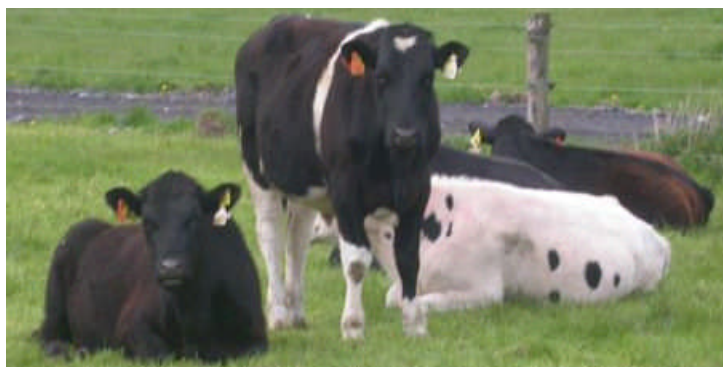
At 3 months of age (110 live weight) in mid May the calves are turned out to pasture where ideally they should graze ahead of older stock in a leader/follower rotational grazing system. Live weight gain is 0.8 kg/day giving a live weight in mid-November of 260 kg. They are then housed on *ad libitum* concentrates for a 6 month finishing period. Live weight gain during finishing is about 1.35 kg/day giving a slaughter weight of 500 kg at 15-16 months of age. Kill-out is about 520 g/kg giving a carcass weight of 260 kg. Total concentrate input is about 1.8 t not including calf rearing.

18-19 month system

Management and performance up to 9 months of age (end of the grazing season) are the same as for the 15-16 month system. The animals are then stored during the second winter at a live weight gain of about 0.65 kg/day. At the end of the winter (13 months) they weigh 340 kg. They are turned out to pasture for a 3-month grazing period during which they gain 0.9 kg/day. By the end of June they weigh 430 kg. They are then housed on *ad libitum* concentrates for about 3 months during which they gain 1.4 kg/day. Slaughter weight is 550 kg at 18-19 months of age. Although this system has the heaviest slaughter weight the animals may be least well finished because of their relatively long period of moderate growth earlier and their relatively short finishing period. Kill-out is about 510 g/kg giving a carcass weight of 280 kg. Total concentrate input is about 1.4 t not including calf rearing

Acknowledgement

Teagasc acknowledge the financial contribution from the Dawn Meats Partnership. The new research project based at Johnstown Castle is investigating the production of bull beef from the dairy herd.



Replacing fertilizers with slurry

Stan Lalor

Teagasc, Johnstown Castle, Wexford.

Slurry has a vital role to play in balancing nutrient supply around the farm and reducing fertilizer bills. Slurry contains significant amounts of N P and K, and good decisions of application timing and distribution around the farm are essential in order to exploit this resource.

Nutrient content of cattle slurry

The nutrient content of cattle slurry can be highly variable, and is affected by many factors such as animal type, animal diet and dilution of slurry with dirty water or rainwater.

Guideline N, P and K fertilizer replacement values for cattle slurry are shown in the table below. Note that slurry dilution (which can be approximated based on judgements of relative dilution with water) has a dramatic effect on the assumed N, P and K value, while application timing and method only have an effect on N.

Table 1. Typical N, P and K fertilizer replacement values of cattle slurries with varied levels of dilution.

		Application		Fertilizer value (units / 1000 gallons)		
DM %	Approximate Dilution	Timing	Method	N	P	K
7	None	Spring	SP	6	5	38
			TS/BS	10		
		Summer	SP	4		
			TS/BS	6		
5	1/3 water; 2/3 slurry	Spring	SP	5	4	28
			TS/BS	7		
		Summer	SP	3		
			TS/BS	5		
3	2/3 water; 1/3 slurry	Spring	SP	3	3	16
			TS/BS	5		
		Summer	SP	2		
			TS/BS	3		
*SP = splashplate						
*TS/BS = Trailing shoe / bandspreader						

Decision making

When planning nutrient applications for the year ahead, slurry should be considered in light of three simple rules of 'where' to spread, 'when' to spread, and 'how much' to spread:

1. Where: nutrient distribution around the farm should be determined by P and K requirements (insofar as is possible considering buffer margins and soil trafficability and land suitability restrictions).

2. When: once distribution around the farm is decided based on P and K requirements, the timing of application should be planned so that the N fertilizer value can be maximised.
3. How much: the rate of slurry application should be based on crop requirements, particularly of P and K. Tanker calibration to ensure accurate application rate is also essential. Dilute slurries will have lower nutrient contents and require higher application rates.

When implementing the nutrient management plan, day to day decisions are also required regarding spreading. In particular, weather conditions are crucial for N efficiency. As a general rule, any farmer who is serious about getting best value from slurry should be asking the question: "Would I be spreading fertilizer today in this field if I wasn't spreading slurry in it?" If the answer is "Yes", then you are saving money on fertilizer. If the answer is "No", then the slurry could be used more effectively either in another field, or on another day.



Irish Cattle Breeding Federation

Pat Donnellan

Irish Cattle Breeding Federation

ICBF Benefits

ICBF is focused on providing benefits to Irish cattle farmers, the cattle breeding industry & its member organizations. It does this by working with its members to deliver the following benefits;

- Increased levels of ancestry recording in non-pedigree cattle.
- Increased levels of performance recording in pedigree & non-pedigree cattle.
- The establishment of breeding objectives & selection criteria.
- Greatly increased availability of breeding indexes.
- Increases in the genetic merit of the semen available.
- Improved farm management as a consequence of having better information.

One of the most well known Beef Breeding Developments to be produced by ICBF is the Beef Euro – Star breeding Index for Beef cattle. This Index reflects how much Profit (€) a farmer can expect to realise from making a breeding decision.

€uro-Star Index

The €uro-Star Index is designed to help farmers increase returns from cattle breeding and is based on available data on all animals in the ICBF Cattle Breeding Database. The data comes from a range of sources within the beef industry, all of which are adding data on a continuous basis to the ICBF database.

€uro-Star Index - Explanation

Suckler Beef Value (SBV) Measure of the Overall Beef Value of an animal.

Weanling Export	Measure of genetic merit of a Bull to <u>produce profitable Weanlings</u> .
Beef Carcass	Measure of genetic merit of a Bull to <u>produce profitable Carcasses</u> .
Daughter Fertility	Measure of genetic merit of a Bull to <u>produce daughters with good fertility</u> .
Daughter Milk	Measure of genetic merit of a Bull to <u>produce daughters with good milk production</u> .

€uro – Stars	5 Stars = Top 20% of the Breed.
★★★★★	4 Stars = Between Top 40% & Top 20% of the Breed.
	3 Stars = Breed Average.
	2 Stars = Between Bottom 40% & Bottom 20% of the Breed.
	1 Star = Bottom 20% of the Breed.

€uro-Star Index – Data sources

Index	Information Source
Weanling Export	1. Individual On-Farm & Mart Weanling Weights (150-300 days old). 2. Individual Weanling price/kg from mart sales. 3. Linear Scoring information recorded by ICBF trained Scorers. 4. Calf Quality recorded by Farmer through Suckler Cow Welfare Scheme.

Beef Carcass	<ol style="list-style-type: none"> 1. Carcass Weight, Conformation & Fat data from Irish Factories. 2. Feed Intake measured at Tully Bull Performance Test Centre. 3. Linear Scoring information recorded by ICBF trained Scorers. 4. Weaning Weight & Live Weight Information.
Daughter Fertility	<ol style="list-style-type: none"> 1. Daughter Age at first calving from calf birth records. 2. Daughter Calving difficulty recorded through Animal Events. 3. Daughter Calving Interval from Calf birth records. 4. Daughter Survival to calve again from calf birth records.
Daughter Milk	<ol style="list-style-type: none"> 1. On Farm & Mart Weaning Weights (150-300 days old).

Herdplus®

Herdplus® is the ICBF Cattle Breeding Information Service for both Dairy & Beef Farmers. Herdplus® uses Cattle Breeding Information from 'Animal Events' (Calving Survey, Milk Recording, Insemination, Linear Score, Weight Recording, Slaughter data etc) to generate valuable reports for your herd. These reports will allow you analyse your own herd's performance as well as allowing you compare your results to National Average Figures.

To find out more about 'Herdplus', call ICBF today on 1850 – 600 – 900 or (www.icbf.com) .



Prospects for Irish beef and live cattle trade

Joe Burke

Bord Bia

A combination of a weaker market demand and strong finished cattle supplies has put pressure on the Irish beef trade over the first half of this year. However, there are signs of stabilisation, with beef imports into the EU remaining well below 2007 levels and beef production declining in many of our major markets. Similarly, Irish finished cattle numbers are predicted to decline significantly, in response to strong live exports over the past 2 years, providing the prospect of improved returns.

Difficult trading environment

In addition to the slowdown in consumer demand for beef, which has seen consumption levels in a number of key markets fall by 2 – 4%, Irish exporters have been faced with a number of other issues brought about by the global economic situation, namely, export credit insurance and payment terms. Currency movements have disproportionately affected Irish exports, with the Euro in May 2010 almost 30% stronger against sterling than it was three years ago. The fact that some 55% of Irish beef exports are destined for the UK highlight its impact on export returns.

EU market recovery

Recent months have seen some indications that the weaker consumer demand for beef across Europe is starting to stabilise and in some cases improve, although with a continued emphasis on mince and the lower value cuts. This said, recent good weather has contributed to a welcome lift in the demand for steak cuts, with striploins and ribeyes strengthening in price.

Latest household purchase data from the UK indicated a 3% increase in beef volume sales, compared to the same period in 2009, while the average retail price was virtually identical. However, figures for France show ongoing pressure on beef sales with a 5% fall recorded for the 4-week period up to the 21st of March.

Consumer decisions will be closely related to economic developments and with most of our main European markets forecasting some recovery in the 2nd half of 2010, there is reason to expect some improvement in beef consumption. This was the view held by many of our leading markets at the recent meeting of the EU beef forecasting working group.

In terms of beef supplies, some decline in EU beef production is anticipated for 2010. In particular, France and Germany are predicting their output will contract, with most of this occurring during the second half of the year.

Beef imports into the EU from outside have risen slightly, with figures for the first three months of the year showing an increase of 9% on 2009 levels. However, maintaining this rate of increase for the year would still leave imports more than 15% below the levels recorded as recently as 2007.

South American countries remain the principle source of these imports, although there has been a notable shift in the volumes from the respective countries. Overall imports from South America have been 7% higher to-date. However, within this, imports from Brazil jumped by 23%. The number of SISBOV-approved farms eligible to supply the EU market now stands at almost 2,000, having doubled over the course of the past year. Beef shipments from Argentina have fallen

significantly, the decline in beef output reflecting the liquidation of much of the country's beef herd and Government restrictions on exports.

Given the anticipated supply/demand developments for 2010, the European beef market appears to be heading into a more stable period, which should help the market environment for Irish beef.

Irish cattle supplies to tighten after strong start to 2010

In terms of Irish finished cattle availability, the year to date has been characterised by a strong increase across all categories of animals. Up to the week ending 22nd of May, total disposals were 14%, or almost 80,000 head higher than 2009 at 649,000 head. The main factors driving this rise in cattle availability include:

- Carryover of finished prime cattle into 2010
- Quiet live export trade in 2008, leaving more animals to finish in this country
- Strong recovery in cow disposals
- Continued growth in young bull supplies

The strongest increase to date has been evident in heifer and cow disposals, which have jumped by 17% and 16% respectively. Part of this increase is due to lower than expected supply levels in both categories during 2009, while the disappointing market situation is also impacting on producer decisions to dispose of certain stock.

Prospects for the second half of 2010 point to a tightening in finished cattle availability. This is largely due to the strong rise exports of calves and other young cattle since late 2008. For the year, net production of Irish beef is expected to increase by almost 5% to 535,000 tonnes, with exports expected to account for over 85% of this.

Export focus on Europe continues

For 2010, beef exports are anticipated to reach 480,000 tonnes, reflecting the increased availability during the first half of the year. The UK market will continue to account for over half of Ireland's beef exports, although the emphasis on other European markets continues to grow.

The UK remains in a deficit beef position, with the latest forecast indicating the UK will require 406,000 tonnes for 2010. The current market position of Irish beef in the UK leaves the industry well placed to fill any increased requirements.

Continental European markets continue to grow their share of Irish exports with 47% of exports destined for this region in 2009. Key markets include France, Italy, the Netherlands and Scandinavia, which between them account for more than 80% of exports to the region. The proportion of Irish beef destined for the Continent looks set to grow in 2010, reflecting stable prices achievable there on account of some tighter availability.

Across the EU, Irish beef is stocked in 3 or more of the top 10 retailers in each major market, with a portfolio of more than 75 retail customers in total. For the year 2009, some 200,000 tonnes of Irish beef were destined for the higher value standard and premium retail and premium foodservice market channels, with a further 75,000 tonnes of quality assured beef destined for the high quality high volume quick service restaurant sector.

Live cattle exports

Live cattle exports have been performing extremely well to date in 2010, with all categories of live exports showing a marked increase on last year's levels. Up to mid May, total live cattle exports

stood at almost 200,000 head, which was over 50% higher than the same period last year. Calf exports accounted for almost two thirds of total cattle exported to date, with the Netherlands, Spain and Belgium accounting for the majority of these animals. A slow down in calf exports is anticipated from now on in line with seasonal availability.

Export of weanlings / store animals collectively accounted for almost a quarter of the total exports to date. This category has also experienced a dramatic uplift, rising by 65% compared to 2009. A key factor here would be the strong performance of exports to Italy. Up to mid-May, over 32,000 animals had been sent to that market which was more than 80% higher than last year. There is strong demand for these animals because supplies from France are well below normal levels on account of lower calf births in 2009, and because customers are satisfied with the quality and health of Irish weanlings over recent years.



Animal Health Ireland

Joe O'Flaherty

Animal Health Ireland (AHI) was formally launched on 28th January 2009. It is an industry-led, not-for-profit, partnership between livestock producers, processors, animal health advisers and government. Its remit includes diseases and conditions of livestock which are endemic in Ireland, but which are not currently subject to regulation and coordinated programmes of control. AHI will not become involved in the direct provision of on-farm animal health services, which will continue to be supplied by existing providers. Neither will it sponsor or promote the services provided to livestock farmers by any individual commercial entity.

AHI provides benefits to livestock producers and processors by providing the knowledge, education and coordination required to establish effective control programmes for non-regulated diseases of livestock. As an independent, science-driven organisation, AHI operates by the principle that Irish livestock farmers and the associated industry should have access to international best practice in herd health.

Mission Statement

To enhance value for livestock farmers and the agri-food industry through superior animal health.

Goals

Through superior animal health and welfare to enhance:

- the profitability and sustainability of individual livestock farms;
- the profitability of the food processing industry; and
- the quality image and competitiveness of Irish livestock and food in the marketplace.

Company Activities

AHI supports livestock farmers and the agri-food industry by increasing awareness of the diseases that fall under its remit, and by coordinating the responses of the various individuals and organisations that currently provide farmers with advice on animal health issues. The following is an indicative list of the type of activities undertaken by AHI; more detailed information on individual disease control programmes is to be found in the Business Plan for 2010/11.

Disease prioritisation

Prioritising the risks posed by the various diseases and conditions affecting Irish livestock is essential if funding for disease control programmes is to be allocated in the most cost-effective manner possible. In order to assist this process of prioritisation, AHI has completed a major study (Delphi study) of the opinions of 85 national experts in fields such as animal health, animal production, agricultural economics and international marketing. A separate survey of farmer opinion, issued in parallel with the Delphi study, indicated that farmers' disease priorities closely match those of the experts. The top seven disease priorities identified in the Delphi study included both specific infectious agents (IBR, BVD, MAP¹) and other multifactorial conditions of livestock (infertility, udder health, lameness and diseases of young calves). A paper on the Delphi study has been submitted for publication in the international peer-reviewed journal Preventive Veterinary Medicine.

Technical Working Groups

AHI has begun the process of bringing together Technical Working Groups, consisting of experienced practitioners and other experts from a variety of fields, tasked with drawing up agreed

¹ Mycobacterium Avium Paratuberculosis (the causative agent of Johne's Disease)

protocols for the planning, investigation, control and monitoring of each of the prioritised diseases/conditions. In addition to the priority diseases and conditions identified by the Delphi study, Technical Working Groups will also be brought together on Parasitic Diseases and Farm Biosecurity.

Development of new resources for farmers and their advisors

AHI has begun the development of a series of information guides for farmers, veterinarians and other farm advisors, with the aim of facilitating a systematic and effective approach to tackling prioritised diseases. The information in these guides is also communicated through regular articles in the print media, particularly the Irish Farmers Journal and Irish Veterinary Journal. In parallel with the development of printed information, a web-based IT system to assist the management of these diseases is being developed in conjunction with the Irish Cattle Breeding Federation (ICBF).

National consultation on animal disease

From time to time, AHI will issue consultation papers with the aim of establishing stakeholders' views on the desirability and feasibility of a national or regional approach to the control of certain endemic diseases of livestock.

Conferences, seminars and workshops

It is envisaged that AHI will host one or two major conferences annually, in addition to a series of smaller seminars and workshops that will be delivered in partnership with the various Stakeholder organisations.

Training and education

AHI will play a role in developing training courses for farmers, veterinarians and other farm advisors.

Primary research

The Technical Working Groups established by AHI to address each of the prioritised diseases will identify areas in which quality information is lacking and will make recommendations as to how these deficiencies might be addressed by new research. In the case of many of the prioritised diseases, it is likely that any new research supported by AHI will focus on the socio-economic aspects of animal disease.

International benchmarking

AHI has undertaken and will continue to undertake a limited number of study visits to observe and learn from best practice in other jurisdictions.

Animal Health

Animal & Bioscience Research Department



The challenge

Improve the health status of the National Herd

Key animal health research areas

- Mastitis
- Bovine respiratory disease
- Nematode resistance
- Johne's disease
- Footrot
- Stress and immunocompetence

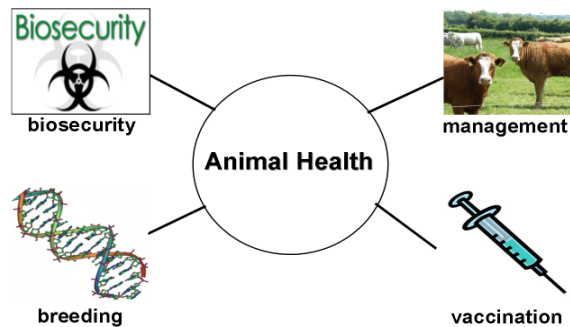


Objectives

Use the latest technologies to develop an understanding of key biological processes influencing immune function and disease/parasite resistance.

To identify genetic and metabolic markers for resistance to diseases/parasites of economic importance that could be incorporated into breeding programmes.

Tools



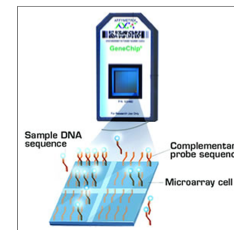
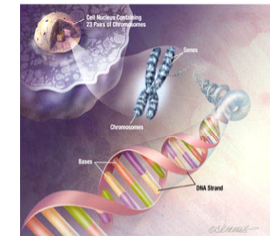
Improving Feed Efficiency



- Analysing the biological basis for **feed intake** in beef production

- Identification of animals that have the genetic capacity for higher feed efficiency

- Gain a better understanding of the biological pathways involved in nutrient partitioning

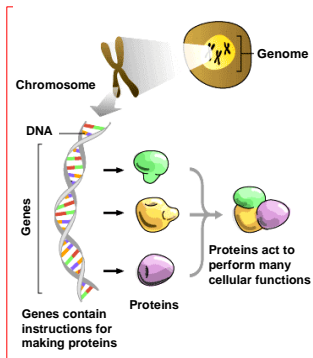


- Quantitative genetic tools to accurately identify more efficient animals

Genetic markers for cow fertility

Background

- Cow fertility is difficult to improve by traditional selection
- Genomics provide new potential



Genomics

- Bovine genome encodes 22,000+ genes
- Challenge is to identify fertility-related genes

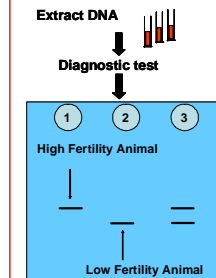
Approach

- Identify cows with “high” and “low” fertility
- Use functional genomics to identify genes affecting conception rate

Objective

- Identification of markers for conception rate will allow accurate and rapid identification of animals with improved fertility

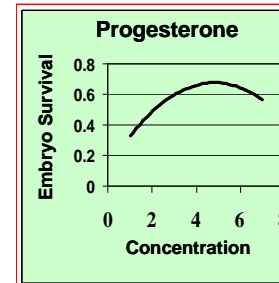
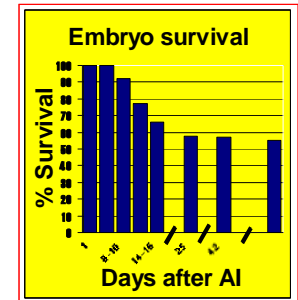
Genotyping for conception rate



Embryo survival in cattle

Background

- More than 40% of cattle embryos die
- 75% of this occurs within 2 weeks of AI
- Blood /milk progesterone concentration is associated with embryo survival



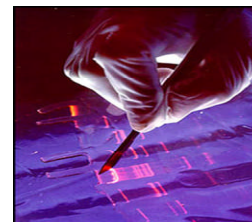
Genomics

- Reduce embryo loss by identifying progesterone regulated uterine genes and proteins.

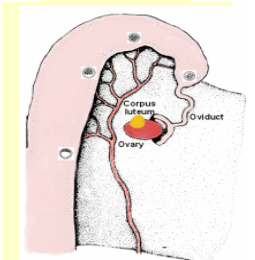
Approach

- Analysis of uterine genes and protein

Protein expression test



Cow Uterus



Objective

- Devise nutrition-based strategy to increase embryo survival
- Develop test for cattle with low potential to conceive