Animal & Grassland Research and Innovation Centre

Grange

Teagasc National Beef Conference

Improved Breeding & Feeding of Suckler Cows to Increase Profitability

9th October, 2014

Hodson Bay Hotel, Athlone.

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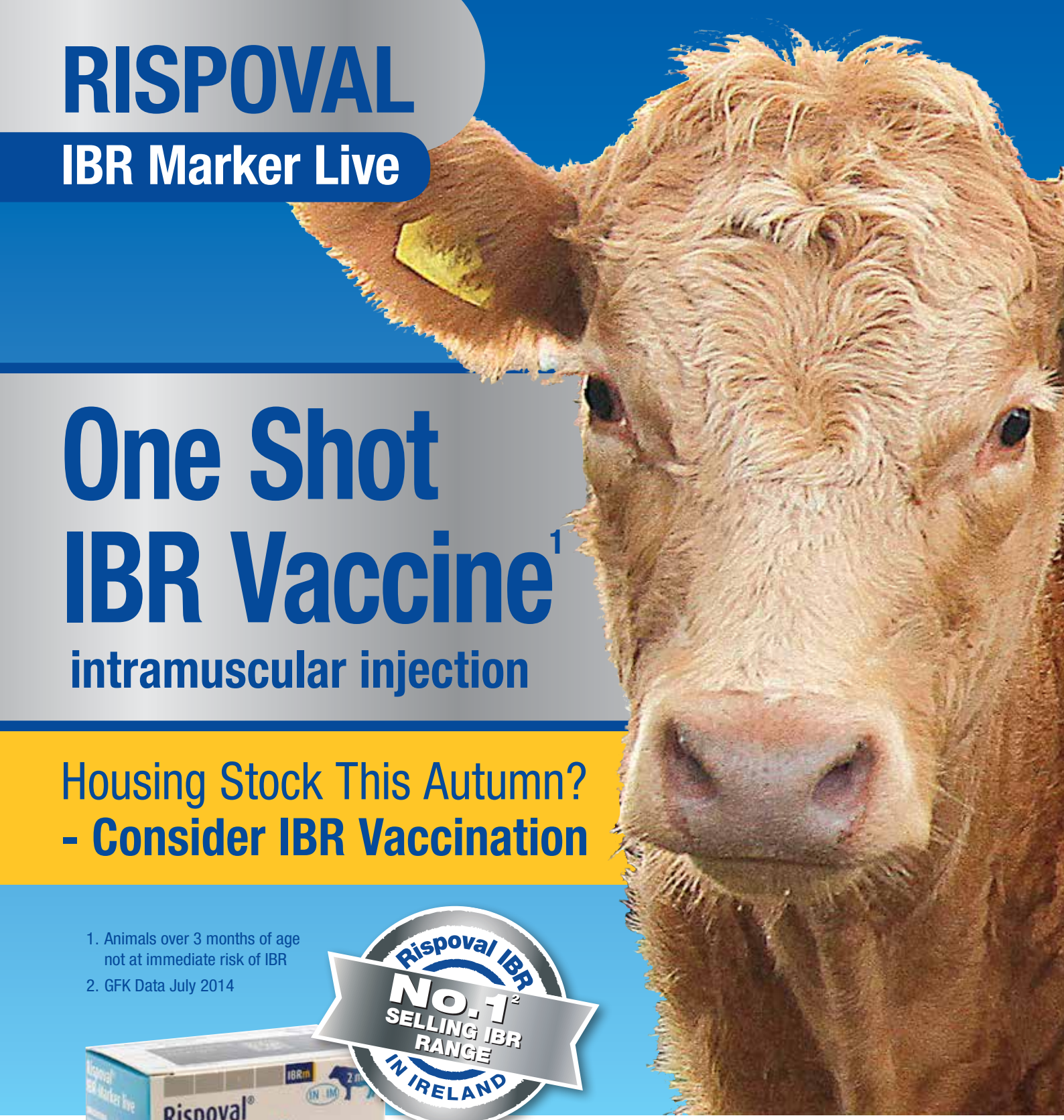

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Teagasc National Beef Conference 2014

'Improved Breeding & Feeding of Suckler Cows to Increase Profitability'

Compiled and edited by: Padraig O'Kiely & Loreto Ferguson, Teagasc.

Published by

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Agriculture and Food Development Authority

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Thursday, 9th October 2014
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2:55pm	Welcome: Tom Kellegher, Teagasc Regional Manager, Longford / Roscommon
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Breeding in Suckler Herds

Chaired by Sean Coughlan, ICBF

3:15pm	**Fertility performance in suckler herds** David Kenny, Teagasc Animal and Grassland Research and Innovation Centre, Grange
3:40pm	**Using the new replacement index to enhance my suckler heifer breeding policy** John & Mairead Kelly, Suckler Farmer, Co. Longford
4:05pm	**Reducing calf mortality up to 12 months of age** Colin Penny, Zoetis (formerly of the Royal School of Veterinary Studies in Edinburgh)
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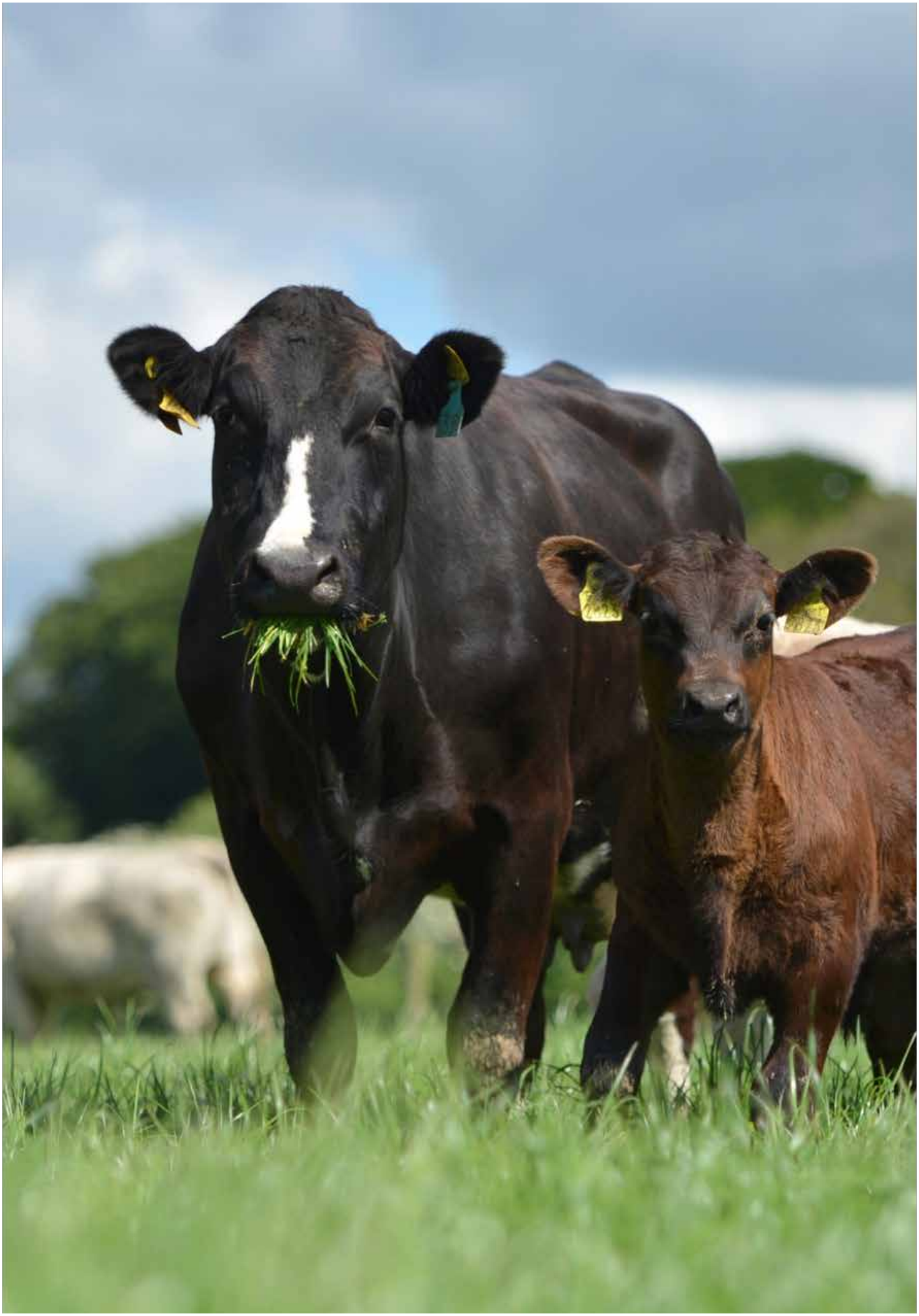
Session Two

Feeding in Suckler Herds

Chaired by Pearse Kelly, Head of Drystock Knowledge Transfer, Teagasc

5:30pm	**Impact of turnout and housing dates on the cost of feeding suckler cows** Paul Crosson and Mark McGee, Teagasc Animal and Grassland Research and Innovation Centre, Grange
5:55pm	**Suckler cow mineral nutrition** Paul Mooney and Anne Marie Crowley, Trouw Nutrition
6:20pm	**Management practices to calve replacement heifers at 24 months of age** Margaret Lehane, Suckler Farmer, Co. Cork
6:45pm	Questions and Answers
7:00pm	Conference close -Tom Kellegher



Foreword

You are all very welcome to the Teagasc National Beef Conference for 2014. This year's conference is focussing on suckling and the main factors directly impacting on the profitability of Irish suckler herds, namely breeding and feeding. Ireland's suckler cow herd of over a million cows is a huge national asset and is the key driver of the country's beef output, valued at €2.1 billion in 2013. There are 65,000 suckler herds in the country and the income generated on these predominately family run farms contributes significantly to local economies in every community.

Notwithstanding the economic importance of our national herd, there are significant challenges facing the future viability of many suckler farms. The Teagasc National Farm Survey and the Teagasc eProfit Monitor analysis of suckler incomes shows that net profits per hectare on many farms are extremely low, or running at a loss, when direct payments such as single farm payment are not included. While the annual costs of inputs, and the per kilogram value of sales, have a significant effect on suckler incomes, the efficiency levels achieved at farm level also play a huge role in determining individual incomes per hectare.

The latest breeding statistics for Irish suckler herds from the Irish Cattle Breeding Federation for 2013-2014 clearly show that major improvements can be made on many farms when it comes to achieving a calf per cow per year. Having the right genetics in the cow and managing her correctly are the key components necessary to achieve this target. The first session today covers what suckler farmers need to focus on when it comes to breeding, along with a comprehensive look at what is necessary to keep calf mortality low, which is another area that can restrict output on a suckler farm. Feed accounts for close to75% of the variable costs on most suckler farms. The second session today looks at how to make best use of feed on suckler farms so that costs are minimised, while at the same time ensuring performance is not compromised.

I would like to thank all of the speakers for writing papers for this conference and for presenting them. I would also like to thank my Teagasc colleagues who have worked hard to ensure the event is successful. I would like to acknowledge the support of Zoetis in sponsoring the Teagasc National Beef Conference this year. I hope you have an enjoyable and informative conference and that you can take something home from it that will go towards improving your own suckling enterprise.

Professor Gerry Boyle

Teagasc Director

Fertility performance in suckler herds

David A Kenny and Michael Diskin

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

Summary

Reproductive efficiency is key to the biological and economic sustainability of suckled beef enterprises and is influenced by four main factors:

- Puberty and age at first calving,
- Duration of the post calving anoestrous interval which is largely influenced by cow-calf bonding and pre-calving nutrition.
- Heat detection efficiency where AI is used
- Bull fertility in herds using natural service herds.

The economic sustainability of suckler cow herds depend on calving at the optimum time each year, on achieving the cow's reproductive rate of one calf every 365 days and on the subsequent performance of the calf. Indeed, Teagasc data show that for every 1% increase in herd pregnancy rate, net margin increases by €11/ha or approximately €5 per cow. For example, increasing herd pregnancy rate on a 40 ha (*100 acre*) farm, from 85% to 95%, would increase net margin by almost €4,500. This is of particular importance, given that on many suckler farms profitability is negative before the Single Farm Payment is included.

Despite its obvious importance, there is now clear evidence of a decline in the reproductive efficiency of Irish beef cow herds. For example, national statistics from the Irish Cattle Breeding Federation (*ICBF*) tell us that only 8 calves are born to every 10 cows per year, with less than 25% of cows producing a calf within a 12-month period. Over the past 5 years calving interval has averaged in excess of 400 days which is well beyond the target of one calf per cow every 365 days. Additionally, only 15% of heifers meet the target of calving for the first time at 24 months of age, with a current national average age at first calving of 32.5 months. Undoubtedly, while much of this inefficiency can be attributed to suboptimal management practices, recent data from ICBF show that this decline in beef cow reproductive efficiency may also have an appreciable genetic component and is symptomatic, to some degree, of an emphasis for many years, on terminal rather than maternal traits within the breeding herd

Reproductive targets for a suckler cow herd

Suckler cow herds, like any livestock enterprise, must set, and aspire to achieve, key targets upon which the performance can be benchmarked. The following are the reproductive and related production targets for suckler cow herds in Ireland: 1) 365 d –calving-to-calving interval; 2) <5 % cows culled annually as barren; 3) >95% of cows calving to wean a calf; 4) Heifers calving at 24 months of age; 5) Compact calving with 80% of cows calved in 42 days; 6) Replacement rate 16-18%; 7) Sustained genetic improvement of the cow herd for economically important traits relating to reproduction, calving ability and calf weaning weight; and 8) Close alignment of calving date with pasture availability. There are three key milestones that must be achieved in a timely fashion in order to meet the above targets. These are:

1) Early onset of puberty and breeding of replacement heifers,
2) Resumption of oestrous cycles post calving,
3) Breeding and the establishment of pregnancy.

1. Puberty and breeding of replacement heifers

The onset of puberty, or sexual maturity, is an important event governing the commencement of a heifer's productive life within the herd. Recent studies at Grange show that in spring-calving herds, delaying age at first calving from 24 to 36 months reduced net margin per hectare by 50%. However, currently the average age at first calving for beef heifers is 32.5 months in Irish herds, and only about 15% of heifers calve for the first time at the target age of 24 months. This represents significant economic inefficiency both at a herd and a national level. Breeding heifers to calve at 24 months of age is eminently achievable but requires the majority to undergo puberty at least 42 days prior to the start of breeding.

It is widely accepted that nutrition during development mediates physiological changes necessary for puberty. In essence, hormones produced in fat tissue as well as the liver, and that reflect the nutritional status of the animal, signal to the brain to increase the secretion of other hormones that control normal ovarian function and the start of regular oestrous (*heat*) cycles. It is important that the heifer has at least two heats before she is bred, as conception rate apparently increases up to the third heat after onset of puberty.

Recommended guidelines for target weights for beef heifers at puberty are 60 to 65%, and at first breeding, 65 to 70 % of estimated mature weight. In a simple example of a continental crossbred cow herd with an average mature cow size of 700 kg, this would require that replacement heifers achieve a target weight of between 420 to 450 kg at 13 months to ensure breeding at 15 months and calving at 24 months. If such heifers were weaned at eight months, weighing 300 kg, they would have to gain in the region of 1 kg every day, on average, for the subsequent 5 months. This is well above the typical post weaning performance of heifer weanlings in Irish suckler herds at present. Thus, to ensure that a high proportion of replacement heifers are eligible for breeding at 15 months, they must be offered adequate high quality feed from weaning onwards. Indeed they should be managed as a separate group from their contemporaries that are destined for slaughter and receive priority for early turnout to grass. In addition to adequate nutritional management, the advent of the new ICBF Replacement Index with significant economic weightings on fertility traits, particularly age at first calving, should facilitate the breeding of heifers that are genetically predisposed to early onset of puberty. Indeed, a major new Department of Agriculture, Food and the Marine funded research project has just commenced at Grange this autumn which will examine the effects of nutritional management as well as breed type and genetics on the control of puberty in beef heifers. As well as generating clear management practices for different breed crosses, the project also aims to identify biomarkers for the early onset of puberty which could eventually be used, through the planned national genomically assisted selection programme, to select heifers that consistently reach puberty, and can be bred, at an earlier age.

2. Resumption of oestrous cycles post calving

Achieving a 365 day calving interval is a key target for suckler cow herds. As mentioned earlier, however, in Ireland, the average calving interval is currently almost six weeks beyond this target. Despite this, there is significant variation amongst herds for this key performance indicator. For example, despite the poor weather conditions over the summer of 2012 followed by the fodder shortage in spring 2013, the average herd calving interval achieved on the BETTER farms was 375 days or almost 30 days shorter than that achieved nationally. Indeed, recent Teagasc data show that for every day that that calving interval extends beyond the target of 365 days it costs a farmer €2.20 per cow or the equivalent of €110 per day, for a 50 cow herd.

The single most important factor influencing the reproductive efficiency of suckler cows is early onset of oestrous cyclicity (*heat cycles*) after calving. Teagasc studies have clearly established that energy intake of the cow in mid to late gestation, mediated through improved body condition score (*BCS*) has a positive effect on reducing the interval between calving and the onset of oestrous cycles. For example, calving the cow in moderate, as opposed to poor BCS,

can advance the onset of cyclicity by 1-2 weeks (*see Figure 1*) and this can be further improved if combined with restricted access to suckling. This latter strategy is being used on many suckler farms with good success, where calves are restricted to once or twice daily access to suckle from 30 days after calving. Generally many cows will be seen in heat two to three weeks later. Overall, pre-calving nutrition has a much greater effect on the onset of heat cycles, through its effect on BCS and the general metabolic status of the cow, than level of feeding post calving. In other words, if a cow calves thin, then additional feeding after she calves will have limited impact on shortening the time to when she has her first heat after calving. The key is to calf cows in moderate to good condition but not overly fat.

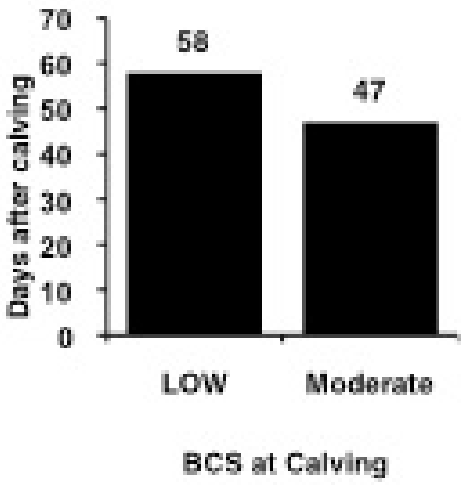


Figure 1. *Effect of BCS on the duration of the interval from calving to resumption of ovarian cyclicity*

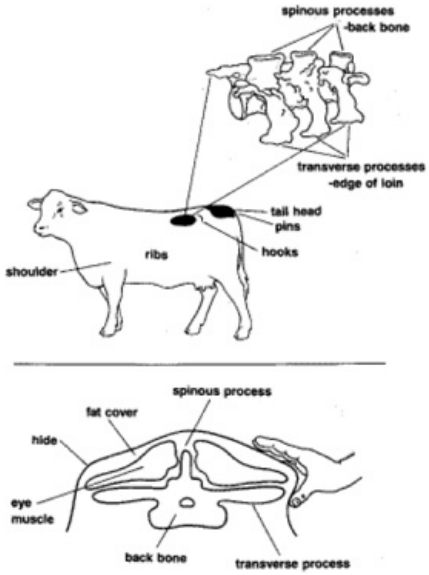


Figure 2. *Body condition scoring technique*

Farmers are encouraged to use the BCS technique to help manage the nutritional requirements of cows, particularly over the winter months (*Figure 2*). Thin cows can be penned together and preferentially fed to increase BCS while fat cows can be restricted, if necessary, so as to avoid problems at calving. For example, cows in very good body condition at housing can afford to lose from 0.5 to 0.75 of a BCS score and this will save the equivalent of up to 1.5 tonnes of silage over the winter months. Analysis of a large retrospective dataset at Grange showed that, in this spring-calving 'seasonal' system, the calving interval was longer for the early-calved (*indoors*) cows compared to cows calved closer to when they were turned out to grass. The recommended BCS targets for key reproductive events for beef cows calving at different times of the year is outlined in Table 1.

Table 1. Effect of calving season on target BCS for key reproductive events in beef cows

Calving Season	Mating	Mid pregnancy	Calving
January - February	2.5	3.0	3.0
March - May	2.5	3.0	2.75
Autumn	2.75	2.25	3.25

3. Breeding and the establishment of pregnancy.

In beef cows, unlike dairy cows, there is no substantial evidence of a decline in conception rate over time. Thus, typical conception rates for beef cows of 60-70% are achievable to either AI or natural service, unless there are problems with semen quality, AI technique or bull fertility. Conception rates reach a normal level in cows bred at 60 or more days after calving. However, when cows are bred at 40 days or less after calving conception rate is usually <40% but it is still advisable to breed such cows once breeding has commenced. What's more, post-calving conception rates are often lower for first-calvers compared to mature cows, which is a reflection of the increased nutritional demands of the young cow for growth in addition to maintenance

and lactation requirements. In Ireland, currently, only ~20% of calves born to beef cows are sired by an AI bull. If using AI, heat detection efficiency is a critical component underlying its success. Fertility is highest following A.I. at 12-18 hours after heat onset but is not greatly reduced following early insemination. However, late insemination, at 24 hours or later, after onset of standing heat, should be avoided. Herds using natural service should be aware that 5% of bulls can be infertile while up to 25% can be subfertile during the breeding season. On-going vigilance for mating ability and fertility is recommended particularly for young bulls.

On-farm research

We at Teagasc Grange have recently commenced a large scale beef cow herd fertility research programme, funded by the Irish Department of Agriculture, Food and the Marine and involving University College Dublin, The Irish Cattle Breeding Federation, The Agri-Food and Biosciences Institute of Northern Ireland and the Irish Farmers Journal. The aim of one project is to examine the main factors affecting reproductive efficiency of beef cow herds across the island of Ireland. Particular emphasis will be placed on the role of specific minerals as well as the disease status of cows. This trial will run over two years with the aim of recruiting at least 200 herds and up to 4,000 cows in total. A second large project within this research programme is a large on-farm study to evaluate various oestrous synchronisation protocols with the aim of developing a strategy to enable the use of fixed-time AI, thus obviating the considerable labour and management input associated with achieving high rates of heat detection.

Genomically assisted selection

Genetic gain for improved cow fertility through traditional selection is often slow due to the typical low heritability of the component traits, difficulties for accurate measurement, and in some instances key traits may only be measured in mature females. However, the incorporation of genomic information into breeding programmes has the potential to significantly increase the rate of genetic gain in complex economically important traits, including fertility. The Beef Genomics Scheme launched by the Department of Agriculture, Food and Marine in conjunction with ICBF will put Ireland in prime position to implement a genomic selection programme for beef cattle which should accelerate the rate of genetic gain for improved reproductive efficiency. Teagasc research has underpinned the initiation and continued development of this technology.

For additional information on the reproductive management of suckler cow herds, including issues affecting bull fertility, the reader is referred to the proceedings of the Teagasc Beef 2014 Open Day (*http://www.teagasc.ie/publications/2014/3205/BEEF2014_web.pdf*). Alternatively contact you advisor for a copy.

Using the new replacement index to enhance my suckler heifer breeding policy

John & Mairead Kelly

Moydow, Co Longford

Summary

- When purchasing a stock bull I use the Replacement Index as an essential tool in conjunction with the physical appearance of the bull.
- Breeding with good genetics is cumulative. This means that if I cross a five star bull with three / four / five star heifers that my heifer breeding and performance will improve year on year.
- I use the ICBF herd reports to identify less fertile cows and cull them. I do this on the basis that I will have better replacement heifers coming into the system.
- I target one calf per cow per year and a calving interval of 365 days.
- I identify heifers from cows with high milk yields and a good fertility history.

Introduction

Alongside my wife Mairead and our two children, we farm 90 hectares (*ha*) in Moydow, Co. Longford. We presently run 90 cows, mostly ¾ bred Limousin. Calving takes place between July and October and I sell weanlings from June onwards to the live export market. Angus male calves from heifers are kept and slaughtered as bulls at 16 months. 90% of the heifers over the last few years have all been kept on the farm as the plan is to expand to 120 cows. We use three Limousin stock bulls and an Angus bull for heifers calving down at two years old. Having bred ¾ Limousin cows my focus has always been on maintaining good milk yields in the herd and making sure all cows are fertile. As a result of this I have been very selective in the stock bulls purchased and any AI used on the farm. Since the initial introduction of the Euro-Star ratings I have tried to use as much of this valuable information along with physical appearance when buying a bull. As you will see later the initial Euro Star ratings on my stock bull have been proven to be correct. While I am always trying to improve the maternal side of the herd, I think that I have cows that have adequate milk to feed their calves and still go back in-calf each year.

Since I started farming I have always had four main objectives for my cows :

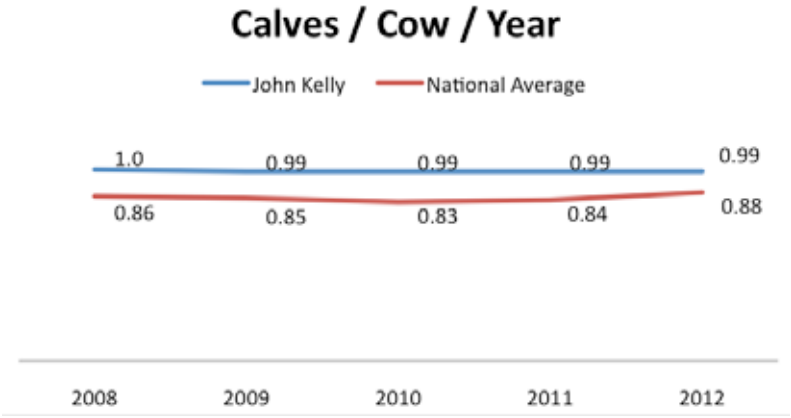
- Try and get one calf from each cow every year
- Cows calve in as short a time-frame as possible to reduce labour input
- Cows back in calf as soon as possible each year – bred at grass
- Breed heifers to have good milk and fertility traits

When I started farming all the above information was not available to farmers. The Irish Cattle Breeding Federation (*ICBF*) creates excellent reports on all suckler herds in the country. They have pulled it altogether in simple farmer-friendly reports as can be seen in Table 1. This shows figures from my latest beef calving report which I look at each year. At a quick glance I can see the critical figures for my herd such as calves/cow/year, calf mortality and calving interval. I can then see where I fare in relation to the national average figure which is also on the report. This information is available to all suckler farmers and I believe we should be making as much use as possible of all the information gathered by ICBF because we as farmers are sending them this information through calf registrations and the beef genomics scheme, etc.

Table 1. Figures from ICBF 2013 – 2014 beef calving report		
	John Kelly	**National average**
Calving interval	374 days	412 days
Calves/cow/year	0.96	0.79
Mortality - birth	1.30%	4.50%
Mortality – 28 days	1.30%	5.60%
% Calving at 2 years	63%	17%

One of my main targets is to be able to get 1.0 calf/cow/year and to have that weanling for sale in May/June/July the following year. This is the basic principle of suckling in my view. This means that I need healthy fertile cows that will go back in calf. As can be seen from Table 1, I have 0.96 calves per cow per year versus the national average of 0.79. This means that if I calve 100 cows I will have 96 live calves to sell versus the average for the country of 79 calves. This is a difference of 17 weanlings to sell each year and at an average value of €850/weanling this equates to €14,450. Figure 1 shows that I have kept this as my main priority over the years.

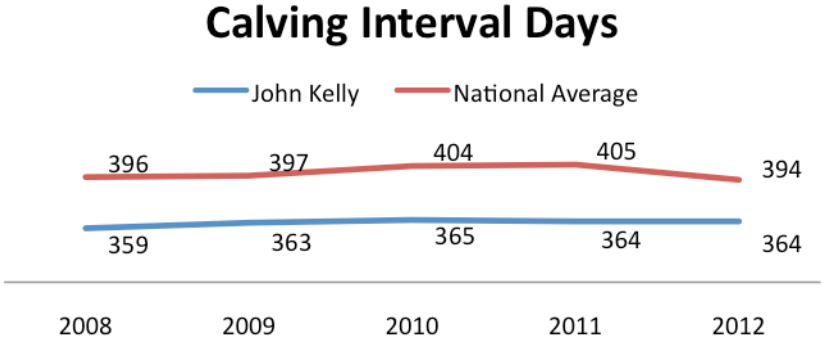
Figure 1. *Yearly values for calves/cow/year*



Source: ICBF

Calving interval is also important and I try to get cows in-calf before they go back into the shed for the winter. As I am calving from July onwards this gives me the opportunity to get up to 75% in-calf before they are housed, depending on weather conditions. My calving interval is 374 days and this has slipped from 364 days last year. I will have to keep an eye on this but would hope to reduce this again as I have a lot of heifers coming into the system and will be culling the less fertile cows on the back of that. Figure 2 shows my calving interval over the last 5 years. As can be seen I have been keeping things as tight as possible and because of this I am within the top 15% of suckler herds in the country each year.

Figure 2. *Yearly values for calving interval*



Source: ICBF

Past breeding strategy for replacement heifers

I have always bred my own replacements on the farm. I used to calve all spring-born heifers down at two and a half years old into the autumn herd and vice versa for the autumn born heifers. I have since changed this strategy as I have gone to complete autumn calving. I had to make a decision whether to calve my heifers at two or three years of age. I decided to calve all my heifers at two years of age to an Angus bull on the advice of my Teagasc adviser James Keane and I am very happy with the results.

As said earlier I have tried to pick a bull on his physical appearance while also using all the information available from ICBF on that particular bull. With this in mind I purchased a Limousin bull bred from the AI bull Ronick Hawk (*RKH*) in 2008. At the time I looked at the bull and liked his appearance and shape. I needed a bull that would bring some milk into the herd if at all possible. I had a bull bred from the Limousin AI bull Dauphin (*DAU*) and from what I could see in my heifers I believed that milk was going to be a problem in the future if I didn't address it at that time. In 2008 the RKH sired bull had a Suckler Beef Value (*SBV*) of €90 which gave him four stars overall. He also was four stars for Weanling Export and five stars for Beef Carcass. To me this was great as I was producing both weanlings for sale and finishing some bulls. He was also three stars for Daughter Fertility and this was what I was looking for - i.e. a bull that would have saleable bull calves and fertile daughters for replacements. This bull has been a great success on my farm. I have cows and heifers bred from him and as can be seen from my calving report figures, they are fertile and have adequate milk to feed their calves. The target weights for bull calves for sale in June is 400 kg and 370 kg for heifers.

Table 2 shows the current Replacement and Terminal indexes for this bull. He has a Replacement Index of €211 (*which gives him five stars for each index both within and across all breeds*) and, most critical of all, the reliability is at 64%. This Replacement index of €211 means that each daughter of this bull will leave €211 extra profit above the average suckler cow, over the course of their lifetime (*all of their calves and their slaughter value*). My initial decision to follow the euro star ratings has paid off and he has produced some top quality heifers on my farm. Under the new Replacement Index we can see that his expected daughter performance for milk is at four stars and again reliability is at 60%. Reliability is obviously high for RKH bred bulls because a lot of information has been gathered around his progeny.

Table 2. 2014 breeding values for Ronnick Hawk sired stock bull

Star rating within LM breed	Economic indices	€uro value per progeny	Index reliability	Star rating across all breeds
5 stars	Replacement	€211	64% (*High*)	5 stars
3 stars	Terminal	€122	65% (*High*)	4 stars
Star rating within LM breed	**Key profit traits**	**Index value**	**Trait reliability**	**Star rating across all breeds**
Expected progeny performance				
	Calving difficulty (*%3 & 4*)	3.60%	82% (*v high*)	
3 stars	Docility (*1-5 scale*)	-0.06	63% (*high*)	1½ star
1 star	Carcass weight (*kg*)	18 kg	78% (*high*)	2 stars
4½ stars	Carcass conformation 1-15	2.28	72% (*high*)	5 stars
Expected daughter breeding performance				
	Daughter calving difficulty (3&4)	5.5%	47% (*average*)	
4½ stars	Daughter milk	2.32 kg	59% (*average*)	3 stars
4½ stars	Daughter calving interval (*days*)	-0.88days	60% (*high*)	3 stars

Current breeding strategy for replacement heifers

My Teagasc adviser has always told me that breeding with good genetics is cumulative. This means that if I have a good five star bull crossed with 3 / 4 / 5 star heifers that my breeding will improve year on year and I will be gaining in terms of heifer performance each year. With this in mind and, needing to invest in two new stock bulls, I purchased two five-star rated Limousin bulls.

APM sired bull - I purchased this Limousin bull sired by Ampertaine Commander (*APM*) in Roscrea in spring 2014 and his euro star ratings are outlined in Table 3. I obviously liked the physical appearance of the bull and was also impressed with his figures. He is a 2013 born bull with a five star rating for the Replacement and Terminal indexes (*within and across all breeds*). For me this bull should produce quality bull calves for sale and good replacement heifers with milk, if everything works out. I was particularly looking at the expected daughter performance and for me the four stars for milk and calving interval were very positive. I know that the reliability for these at 25% is low but from my previous experience with the RKH sired bull I am hoping that this bull will breed good performing heifers. I looked at the figure in the daughter milk index of +3.14 kg and this tells me is that if I have heifers out of this bull that their calves will be 3.14 kg heavier at weaning than the average calf in the country. This is obviously very early to predict but my previous experience has told me to pick with visual appearance, while also using the euro star ratings. This bull has either four or five stars for docility, carcass weight and carcass conformation. I have checked his ancestral breeding and his maternal grand sire is Otan (*OTX*) who is very reliable for improving milk yield and fertility. If he produces all that is set out for him he will be a great addition to my herd.

Table 3. 2014 breeding values for APM sired stock bull

Star rating within LM breed	Economic indices	€uro value Per progeny	Index reliability	Star rating across all breeds
5 stars	Replacement	€201	25% (*Low*)	5 stars
5 stars	Terminal	€138	28% (*Low*)	5 stars
Star rating within LM breed	**Key profit traits**	**Index value**	**Trait reliability**	**Star rating across all breeds**
Expected progeny performance				
	Calving difficulty (*%3 & 4*)	5.30%	33% (*Low*)	
4½ stars	Docility (*1-5 scale*)	0.02	45% (*Average*)	3 stars
5 stars	Carcass weight (*kg*)	32 kg	32% (*Low*)	4½ stars
4½ stars	Carcass conformation 1-15	2.34	25% (*Low*)	5 stars
Expected daughter breeding performance				
	Daughter calving difficulty (3&4)	4.8%	13% (*V Low*)	
4½ stars	Daughter milk	3.14 kg	27% (*Low*)	3½ stars
4 stars	Daughter calving interval (*days*)	0.88 days	19% (*V Low*)	2½ stars

Galbally Danastic sired bull – I purchased this 2012 born Limousin bull in autumn 2013 (*Table* 4). He is five stars on the Replacement and Terminal indices and five stars on the sub-indices of docility, carcass conformation and carcass weight. Like the previous bull he is positive for daughter milk yield at +0.55 kg. This may seem to be quite low but I believe that having a positive figure here as opposed to a negative figure is what you need when thinking of replacement heifers.

Table 4. 2014 breeding values for Galbally Danastic sired stock bull				
Star rating within LM breed	**Economic Indices**	**€uro value Per progeny**	**Index reliability**	**Star rating across all breeds**
5 stars	Replacement	€275	24% (*Low*)	5 stars
5 stars	Terminal	€138	25% (*Low*)	5 stars
Star rating within LM breed	**Key profit traits**	**Index value**	**Trait reliability**	**Star rating across all breeds**
Expected progeny performance				
	Calving difficulty (*%3 & 4*)	6.00%	27% (*Low*)	
5 stars	Docility (*1-5 scale*)	0.20	37% (*Low*)	5 stars
4½ stars	Carcass weight (*kg*)	29 kg	28% (*Low*)	4 stars
5 stars	Carcass conformation 1-15	2.44	25% (*Low*)	5 stars
Expected daughter breeding performance				
	Daughter calving difficulty (3&4)	4.2%	17% (*V Low*)	
3½ stars	Daughter milk	0.55 kg	21% (*Low*)	3 stars
5 stars	Daughter calving interval (*days*)	-2.96 days	21% (*Low*)	4 stars

Breeding plan: Autumn 2014

My plan for this autumn is to use the three bulls above. I have to be careful with the older Ronick Hawk sired bull not to cross him with heifers bred out of him. I will run him with cows when the breeding is checked. The APM sired bull was only born in March 2013 so is quite young. I will only put him with 20 cows to ease him in gently for the year. I will also run the Galbally Danastic sired bull with the cows as he was born in May 2012 and will be that bit stronger.

As I stated already, I calve the heifers down at two years of age and will run an Angus bull I have with these yearling heifers. This has been a very positive experience with easy calving on the heifers and a good healthy thriving calf. I was not convinced about two year old calving before I tried it but having done it for a few years I see more money in my pocket each year as a result of having the extra calf on the ground to either sell or slaughter.

I intend to go to 120 cows in the very near future and have been keeping extra heifers as replacements with this in mind. This year I have kept 36 heifers as for the last few years I kept over 20 heifers but have found it hard to build numbers. Every year there are obviously cull cows to sell but hopefully in the future I will get there.

Conclusion

As suckler farmers we have to aim to get one calf per cow per year. We must try and have quality calves for sale but also breed heifers that will be fertile and have enough milk to rear a calf. In my opinion we must use every tool available to us when making decisions on buying a bull or using AI. This new Replacement Index should give us the confidence to pick bulls on their genetic evaluations and it is there as an extra tool for all suckler farmers to use. We all try to use the best breeding available and if we use five star bulls on top quality heifers I believe the return long-term will be very positive for the suckler industry.

Reducing beef calf mortality up to 12 months of age

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Summary

- Calf mortality in the first 12 months of life can be minimised if the main risk periods are tackled in a logical way and health planning in collaboration with the farm vet, is carried out to avoid disease "disasters".
- Start with tackling losses due to bad calvings and then for each disease risk apply the 3 principles:
- **Maximise** the calves' innate immunity (*robustness*).
- **Boost** the acquired immunity with vaccines if appropriate, and
- **Control** the level of challenge from the risk pathogens (*bacteria, viruses and parasites*).

What is "acceptable" calf mortality?

In an ideal world beef farmers would be aiming for 0% calf mortality but this is rarely achieved. However, if we are expecting farms to aspire to target a weaned calf crop of 94% (*94 calves weaned per 100 cows/heifers to the bull*) or above then significant calf mortality cannot be tolerated. The range of calf mortality up to 12 months of age in the beef herd will be wide but it is clear that farms can achieve levels of <5% mortality between birth and 12 months of age if management is good. The purpose of this paper is to highlight the areas of management that can have the greatest impact in reducing calf mortality.

What are the main risk periods/causes of mortality in the first 12 months?

Many surveys have consistently shown the main risk periods for beef calves are the neonatal period (*birth-4 weeks*), and then around weaning, especially if this coincides with housing as is the case with spring-born suckled calves. Sporadic losses will occur between these times. The main causes of mortality in young calves have also been clearly established and are:

- Scour/enteritis
- Pneumonia
- Septicaemia/joint ill/navel ill

As calves get older (> *3 months of age*) the main cause of death is pneumonia along with other sporadic causes such as clostridial disease (*Anon., 2010*). As many calves die around birth and are not submitted for post-mortem then these losses are often not recorded.

How can you reduce the risk of losses in these key periods?

Rather than go through a detailed list of diseases and control methods which can lead to information overload, a different approach may be to look at each risk period and identify the key practical management things that you could implement or review on your farms to reduce the risk of losses. A simple way of looking at this from a disease point of view is to think of how you can make the calves on your farm less susceptible to disease risk and for most diseases you can break it into three key aspects:

- **Maximise innate (natural) immune defences** – innate immunity is the first line of defence in calves against disease and includes things like healthy mucous membranes, healthy muco-ciliary defences in the upper respiratory tract, healthy gut bacterial flora and effective white blood cells. Another way of describing innate immunity is the calves natural robustness or

resilience to disease.

- **Boost adaptive (acquired) immune defences –** the first way a calf obtains acquired immunity is via antibodies in colostrum and then as these wane they can be replaced by immunity from natural exposure (*acquired/adaptive immunity*) or boosted by vaccines.
- **Reduce exposure to the pathogen (bacteria, viruses, parasites)** – while some exposure to pathogens can be beneficial to allow acquired immunity to develop for later life, the aim must be to prevent overwhelming exposure to pathogens which can cause disease or death.

If you approach each disease risk period on your farm with these factors in mind then you will have a logical approach to reducing the risk of calf deaths. You can never create zero risk but you can plan for avoiding "disease disasters"!

To show how this principle can be applied we can break up a year in the life of a typical spring born beef calf to be weaned and housed in late autumn.

Risk period 1 – Birth and first month of life

Dystocia (assisted calving) is a major contributor to calf mortality and, even if calves don't actually die during a problem birth, the stress and trauma of being winched or pulled into the world alive has serious consequences for the risk of mortality in the next few weeks. Pulled calves are less likely to get up and suckle adequate colostrum due to pain/acidosis/injury so this will lead to increased risk of septicaemia, joint/navel ill and then scour. Reduction of dystocia risk requires careful bull selection (*utilise EBV data*) and good cow/heifer nutritional management. The use of AI can allow access to bulls with accurate EBV figures for ease of calving.

Scour reduction

Scour has been identified as the main cause of death in calves born alive during the first month of life so how can you reduce risk applying the three principles?

- **Maximise innate (natural) immune defences :** ensuring calves have an easy-calving , are not born deficient in any trace elements (*e.g. selenium, iodine*) and vitamins and have healthy gut flora will all help reduce the risk of scour . If BVD virus is circulating in a group of young calves this will also lead to depressed innate immunity. If calves are born into a wet, cold or draughty environment this will create thermal stress which can also weaken their resilience to disease.
- **Boost acquired immune defences:** As calves are born with no specific immunity to the microbes causing scour, the importance of colostral antibodies is critical. Ensuring calves get 3 litres of good quality colostrum in the first 6 hours of life is critical but this can be boosted by vaccinating late pregnant cows with anti-scour vaccines which can boost the levels of antibodies in the colostrum to *E.coli*, rotavirus, and coronavirus. *Salmonella* vaccines may also be beneficial in herds at risk. There is no vaccine to help protect against the common scour protozoa *cryptosporidia*. However, by reducing risk of rotavirus and coronavirus, the severity of scour caused by *cryptosporidia* can be reduced greatly. Oral antibody pastes / drenches for newborn calves may help in an emergency situation, however vaccination of dams followed by good colostrum intake is a better approach.
- **Reduce exposure to the pathogen (bacteria, viruses, parasites):** for calf scour this area of risk can be managed to reduce losses. If calving indoors in straw-bedded yards remember the initial source of microbes causing scour is dung from cows or older cattle. The ideal approach is to calve onto clean straw yards and then keep similar age groups of calves/ cows moving together through the system until they can be turned out to clean pasture. As the scour-causing microbes are picked up in the first week of life they pass through the calves and are multiplied up and re-excreted in the next 2-3 weeks of life. Thus, adding new-born calves/dams into a calved group which has calves born over the previous month will

immediately expose them to a much higher risk of disease. If space allows it then house the cows that calve in the first 2-3 weeks of the calving season in one yard, and then later calving cows should be removed from the main group and enter a fresh yard/pasture for calving. After all calves are over a month of age they can more safely be grouped back together. Any scouring calves should be moved out into a hospital pen area if possible for treatment /recovery to reduce contamination of the yard.

Risk period 2 – Pre-weaned calves at pasture

The main causes of disease/mortality in this period are probably coccidiosis (*protozoan parasite*), stomach/intestinal worms, lungworms, liver/rumen fluke and clostridial diseases (*e.g. blackleg*). Diseases like coccidiosis and stomach/intestinal worms rarely cause death but can lead to significant growth reduction and loss of resilience to other diseases. If we apply the three rules-of-thumb to these pasture-based diseases we can focus on how to reduce potential losses.

- **Maximise innate (natural) immune defences :** for parasitic diseases such as coccidiosis and worms then the animals best defence can again be described as being as robust or resilient as possible. In the future, breeding/selection for resilience to parasitic disease may be possible but simply ensuring the absence of BVD carrier animals in the group, and ensuring good trace element and nutritional status, will help a lot with natural resilience.
- **Boost acquired immune defences :** Vaccines are not available for any coccidial or parasitic diseases with the exception of lungworm. Lungworm vaccine needs to be administered as a two dose drench to calves prior to being turned out for their first grazing season so in many cases this vaccine is impractical in beef calves. There are effective vaccines against clostridial disease so if the farm has a history of losses from blackleg, tetanus, black disease, etc., then vaccination may be cost beneficial.
- **Reduce exposure to the pathogen (bacteria, virus, parasite):** Control of coccidiosis and parasitic disease at pasture is a balance between allowing some exposure so as to permit acquired immunity to develop but without allowing an overwhelming challenge to trigger disease and growth rate loss/death. Control of **coccidiosis** is similar to scour control as the cows/older calves are the source of the infection in the environment. Keeping groups of cows/calves in similar aged batches and avoiding a build-up of infection in yards/paddocks will help reduce risk. Some types of coccidia (*eg* ***Eimeria alabamensis***) can survive on pastures for up to a year so using the same permanent pasture fields for turning calved cows out onto year after year can allow the build-up of infection. If exposure to coccidial oocysts cannot be controlled then targeted treatment with anti-coccidial drenches may have to be considered at around 1-3 months of age. In dairy calves, coccidiosis can be controlled by medicating creep feed with a coccidiostat (*decocquinate*) but this option is not normally possible in spring-born beef calves.

Control of **gut/lungworms and fluke** can be achieved by clean grazing strategies but this option is not often possible so in most cases the use of targeted wormer/flukicide treatments is the control method of choice. As spring-born calves get exposed to more worm larvae as the summer grazing goes on then worming will minimise any growth rate setbacks. The critical worming dose for spring born calves is at housing when they must be wormed to clear out gut/lungworms/fluke that may have been picked up in late summer/autumn. The wormer used must be effective against inhibited stomach worms (*ostertagia*) otherwise this worm can emerge and cause disease during the late-housing period. Timing of flukicide dose will depend on risk level and product used as not all products will kill immature fluke. An ideal strategy is to worm a few weeks **prior** to housing with a long acting wormer that will remove gut and lungworms. This prevents the risk of triggering pneumonia problems which can be seen when calves are housed with lungworms and then wormed at weaning /housing. The action of killing worms in the lungs can trigger coughing and allow other pneumonia micro-organisms to take hold.

It is hard to influence the exposure risk to **clostridial** disease bacteria as they can exist as

highly resistant spore forms in the soil and in vegetation/spoiled feeds. Certain fields may have a history of blackleg or tetanus and this may suggest soil contamination so perhaps these fields can be avoided. With botulism there is a clear risk associated with exposure to poultry waste.

Risk period 3 – Weaning and housing

The main cause of mortality in the weaned/housed calf in the age range 6-12 months of age is pneumonia so this should be a focus for any farm that is experiencing losses from this disease. It must also be remembered that death from pneumonia is the tip of the iceberg and if deaths are occurring then major losses are likely from reduced growth rate in calves that are treated and "recover". What can be done to reduce risk of pneumonia losses?

- **Maximise innate (natural) immune defences:** Pneumonia is a complex disease caused by a mixture of bacteria and viruses, and the innate immune defences play a critical role in protecting the calf from disease. Many of the bacteria that cause pneumonia are carried in the throat/tonsils of healthy calves but "stress" or damage to the protective lining of the upper respiratory tract (*by viruses, dust, fumes*) can allow them to invade the lungs and cause disease. To ensure the innate immune defences have the best chance or working well then calves should not experience multiple stresses such as weaning, dehorning, castrating, change of diet, transport, etc., at the same time if possible. Preventing severe deficiencies of trace elements such as copper and selenium will also help to maximise innate immunity as will ensuring parasites such as lungworm and liver fluke are treated before housing/weaning. Again the presence of BVD carrier (*PI*) calves in the group at housing can trigger pneumonia by lowering the calves general immunity/resilience.
- **Boost acquired immune defences:** Vaccination can play a critical role in reducing the risk of pneumonia as there are vaccines available for many of the major pneumonia causing pathogens (*ie RSV, PI3, IBR, BVD and* ***Mannheimia haemolytica***). Calf pneumonia vaccines should ideally be given **prior** to housing so full immunity is in place at the time of greatest risk. Vaccines will not eradicate pneumonia but, if used correctly in conjunction with other management changes to reduce risk, they can make an enormous impact on pneumonia incidence and severity. The potential cost-benefit balance of reducing deaths and losses ***versus*** treatment costs and growth rate reduction is enormous, but sadly often overlooked.
- **Reduce exposure to the pathogen (bacteria, virus, parasite):** Pneumonia pathogens are endemic on most farms so a degree of risk is almost inevitable. Some viruses like IBR and BVD may not be present on accredited high health farms so biosecurity measures must be in place to prevent their introduction. For other viruses like RSV and PI3 the risk is present on most farms and again it will be older cattle/cows that harbour the viruses. Thus, avoiding mixing age ranges of cattle can help reduce risk. This, however, is not practical with autumn-born or pre-weaned spring-born calves which will be housed with cows so the only way to reduce exposure risk is to improve the housing environment. Viruses and bacteria thrive in poorly ventilated, humid, crowded conditions so wherever calves are housed you should critically evaluate the buildings and ask the following three questions :
  - » Is clean, fresh air being provided in all weather conditions?
  - » Is moisture being controlled to reduce humidity?
  - » Is wind speed controlled at calf level?
  - » If each of these factors is addressed it can significantly reduce the risk of pneumonia by creating an environment in which viruses and bacteria will not easily survive, as well as reducing calf stress from windchill.

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Impact of turnout and housing dates on the cost of feeding suckler cows

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Summary

- As grazed grass is the cheapest feed, suckler beef production systems must optimise its proportion in the total annual feed budget.
- The management of cow condition score, whereby body reserves are deposited during the grazing season and mobilised during the relatively expensive winter feed period, is a key element of profitable suckler beef systems.
- Turnout date to pasture and the length of the grazing season is largely dictated by location and prevailing weather. However grassland management practices also have an important influence.
- Analysis of suckler beef systems show that, at current prices, profitability is greatest where calving date is aligned with the commencement of the grazing season.

Introduction

The Irish suckler cow herd is predominantly comprised of spring-calving, crossbred cows, on grass-based systems of production. Feed provision accounts for over 75% of the variable costs in these production systems. In calf-to-weaning systems the cow consumes over 85% of the feed required annually. Consequently, feeding the suckler cow is the major expense incurred in suckled calf production. Of the predominant feedstuffs readily available, efficiently managed grazed grass is the cheapest, followed by grass silage which, in turn, is cheaper than concentrates (*Finneran* ***et al.****, 2012*). This means that maximising the proportion of grazed grass in the annual feed budget is central to sustainable suckler beef production systems. However, due to the seasonality of grass growth in Ireland, an indoor winter period is necessary. The duration of this indoor period is dictated by factors such as prevailing climatic and weather environments, soil and sward type, and grazing conditions and management. For the spring-calving suckler cow, grass silage is the primary, and usually sole, feedstuff offered during this time.

Although the indoor winter period is usually of shorter duration than the grazing season, primary feed costs on most suckler farms relate to this period due to the relative costs of grazed grass and grass silage. For example, within spring calving, grass-based, suckler calf-to-weaning systems at Teagasc Grange (***ca.*** *4.5 month winter*), almost three-quarters of the feed consumed annually is comprised of grazed grass, with the remainder made up of grass silage (*26%*) and concentrates (*1%*). For calf-to-beef systems, the corresponding figures are 60% grass silage, 30% grazed grass and 10% concentrates. However, when this feed budget is expressed in terms of cost (*excluding land charge*), the outcome is very different, in that grazed grass makes up a smaller proportion of total costs than grass silage. Thus, while grazed grass is fundamental, feeding silage is a key (*cost*) component of suckler cow nutrition. Consequently, in order to maximise profitability of suckler systems, a long grazing season with a corresponding short indoor winter feeding period is desirable, and provision of the cow's winter diet at as low a cost as practicable is necessary.

Feeding the suckler cow

For economic reasons suckler cow nutrition generally involves mobilisation of cow body reserves in winter when feed is more expensive, followed by the deposition of body reserves during the subsequent grazing season when consuming lower cost grass. Body condition score (*BCS*) - a measure of the relative fatness or body reserves of a cow - is an important factor to consider in relation to suckler cow nutrition. It is not desirable to have suckler cows in very high or very low BCS; target BCS at key times are provided in Table 1. Management of BCS has implications for cow reproductive performance, milk yield, health and well-being and, in extreme cases, calving difficulty, but also feed costs.

Table 1: Target body condition scores (*scale 0-5*) for spring- and autumn-calving cows

	Spring-calving	Autumn-calving
Housing	3.0-3.5	2.5-3.0
Calving	2.5	3.0
Breeding (*autumn calving cow*)	-	2.5
Turnout to pasture	2.0+	2.0
Breeding (*spring calving cow*)	2.0-2.5	-

Spring-calving cows: Pre-calving nutritional management

The BCS of cows at the start of the winter feeding period has a major effect on the amount and quality of feed required. Where mature spring-calving suckler cows are in good BCS (~3.0+, *Scale 0-5*) at the start of the winter their feed energy intake can be restricted such that some of the body fat reserves are utilised to reduce winter feed requirements. This feed energy restriction can result in a feed saving of up to 25%, equivalent to 1.0 to 1.5 tonnes fresh weight of grass silage. The feed energy restriction can occur in various ways, such as offering moderate digestibility (***ca***. *66% DMD*) grass silage to appetite, "diluting" the energy value of good quality silage with straw and offering that to appetite or by restricting the amount of good quality silage offered daily. Where silage digestibility is poor, concentrate supplementation will be necessary. However, if cows are not in good BCS at the start of the winter, they cannot be restricted and must be fed to requirements. This particularly applies to first-calvers and old/thin cows.

Spring-calving cows: Post-calving nutritional management

Cows turned out to grass shortly after calving, or calving at grass, in spring should not require concentrates, provided they have access to an adequate supply of high nutritive value grass. After calving, cows in average BCS can be fed moderate to high digestibility grass silage to appetite for about 4 to 6 weeks, provided they are then turned out onto high quality grazing pasture. The latter is critical for good reproductive performance (*Drennan and Berry, 2006*). If calved earlier than this and particularly if BCS is low (<2.5), then a higher nutritive value (*more expensive*) diet is necessary. If silage digestibility is poor then at least 1 to 2 kg concentrate supplementation is required daily. Cows in poor BCS after calving will require additional concentrates. First-calvers require concentrate supplementation, in all cases, from calving until turnout to pasture. Where silage quality is moderate to good, 1 to 2 kg meal is required and where silage quality is poor, 2 to 3 kg meal is required, daily. An appropriate mineral/vitamin should always be offered.

Spring calving date and turnout date to pasture

Turnout of livestock to pasture in spring has to be delayed until grass growth begins and sufficient herbage has accumulated to meet animal demand. Additionally, grazing conditions must be adequate. Commencement of grass growth is largely determined by ambient soil temperatures i.e. a grass growing day is classified as a day where soil temperature is >5°C at 9.00 am (*O'Donovan* ***et al.***, *2010*). This is very much location/site dependent. For example, applying this criteria to four temperate recorded sites in Ireland namely, Moorpark (*Cork*), Casement

aerodrome (*Kildare*), Ballyhaise (*Cavan*) and Grange (*Meath*) over a 10 year period results in mean grass growth commencement dates of 15 February, 9 March, 12 March and 25 March, respectively, with large variation between years (*Williams and O'Kiely, unpublished*). As a result, the degree to which early turnout to pasture can be easily exploited will vary substantially according to geographical location/site, but also from year to year in relation to meteorological, soil, sward, grazing conditions and grassland management practices. This means that having a sufficient buffer of winter forage is critical and flexibility in grazing management is required.

Compact calving before turn-out to pasture in spring in order to maximise herbage utilisation is an essential component of profitable grass-based suckler systems. Mean calving date should coincide with the start of the grass growing/grazing season. Research at Grange has shown that, earlier calving and turn-out to pasture (*onto the grazing platform*) generally 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 (*Crosson* ***et al.****, 2009*). Furthermore, slurry handling costs are reduced. However, earlier calving and turn-out to pasture in spring 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, calving too early leads to a decline in profitability as higher costs, usually associated with autumn-calving systems, start to materialise, such as higher quality grass silage, concentrate supplementation and straw bedding and facility costs for calves.

The herbage mass available to grazing livestock during spring can be increased if all the grassland on a farm, including the area destined for first harvest silage, is utilised during the first grazing rotation, although grazing spring swards designated for first cut silage may have adverse effects on subsequent silage yield especially when the interval between spring grazing and silage harvesting is relatively short (*O'Riordan* ***et al.****, 1998; Humphreys and O'Kiely, 2006; McGee* ***et al.****, 2014*). This has important ramifications for farm profitability considering the negative relationship between yield and cost of producing grass silage (*Finneran* ***et al.****, 2011, 2012*).

Where grazing conditions are difficult restricted / "on-off" grazing, whereby animals are given limited access time to pasture daily, may be used. In a series of studies at Grange, earlier turn-out to pasture in spring (***ca****. 3-4 weeks*) of suckler cows via restricted (*i.e. 6 hours daily - cow only*) or fulltime access (*cow & calf*) to pasture resulted in feed cost savings of between €0.52 and €1.11 per cow per day with no recorded adverse effects on animal performance (*Gould* ***et al.****, 2010; 2011*).

Feed costs and profitability

To quantify the relative costs and economic returns of alternative calving dates and grazing season lengths for suckler systems, analysis was carried out using the Grange Beef Systems Model. Five alternative calving dates were analysed representing cows calving from January to May in spring-calving systems and one calving date (*September*) representing autumn-calving systems. Three alternative grazing season lengths were modelled representing sites with short grazing season lengths (*15 April to 15 October*), medium length grazing seasons (*15 March to the 31 October*) and long grazing seasons (*15 February to 15 November*). In spring-calving systems cows were turned out at calving or when the grazing season commenced, whichever occurred later. A 40 hectare farm and a continental crossbred cow herd were assumed. Replacements were bred from within the herd and first calved at 24 month of age. A single harvest of grass silage was assumed with harvest date of late May (*silage DMD 73%*) and early June (*silage DMD 68%*) for autumn- and spring-calving systems, respectively. Herbage utilised was set at 9 t DM per hectare and, depending on production system (*calf-to-weaning or calf-to-beef, calving date and grazing season length*), the number of cows calving was altered so that the herbage produced was fully consumed. In the spring and autumn calving calf-to-weanling systems, calves were sold on 31 October and 30 June, respectively. In the calf-to-beef scenarios steers and heifers were finished at 24 and 20 months of age, respectively.

February-calving systems were most profitable for calf-to-weaning systems (*Figure 1*). This

system provided the optimal balance between output (*relatively early-born calf resulting in a heavy (335 kg)* weanling) and cost efficiency (*calving close to turnout date so that a high proportion of the total diet of the cow is grazed grass*). In contrast, May-calving was least profitable since output is low (*later-born calf resulting in a younger, lighter (285 kg)* weanling) and costs are greater (*calving after the start of the grazing season so that a higher proportion of the total diet of the cow is grass silage*). January calving was less profitable than February or March calving since cows are indoor for longer and require higher levels of relatively expensive concentrate supplementation. September calving was found to be more profitable than April- and May-calving (*bearing in mind that the weanling price assumed was greater for September calving than spring-calving systems*) but less profitable than early spring-calving systems. Feed costs per cow calving ranged from €273 for March calving animals to €389 for September calving animals. When all costs are considered, cows calving in September have 37% higher costs than those calving in March. As expected, the length of the grazing season had a considerable impact on net margin with the long grazing season scenario returning a net margin 2.7 times greater than the short grazing season.

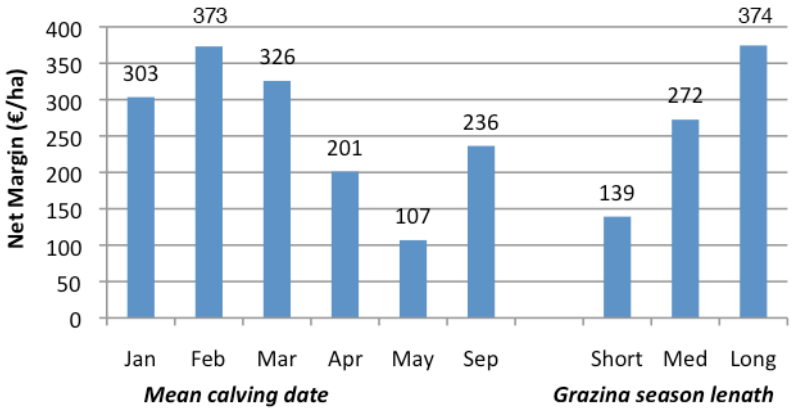

Figure 1. *The impact of calving date and grazing season length on the profitability of suckler calf-to-weanling production systems. For the calving date scenarios, calving date is in the middle of each month. The modelled lengths of the grazing season are; Short 184 days, Med 220 days, Long 252 days. Assumptions: CAN €320/t, Urea €360/t, Concentrates €235/t, spring born bull weanling price €2.40/kg, spring born heifer weanling price €2.30/kg, autumn born bull weanling price €2.65/kg and autumn born heifer weanling price €2.55/kg.*

On average, calf-to-beef systems returned similar margins to calf-to-weanling systems (*Figure* 2) for the prices and levels of performance assumed in this analysis. March-calving systems were most profitable for calf-to-beef systems. In contrast to the calf-to-weanling system where earlier birth dates resulted in weanlings that were older and heavier at sale, increased output resulting from earlier calving was not captured in calf-to-beef systems since all progeny were slaughtered at the same age. Thus, closer synchrony between calving and turnout date was financially optimal. Again, May-calving was the least profitable of the spring-calving systems. September-calving was found to be the least profitable of all systems with net returns only slightly greater than breakeven. Costs per cow calving where progeny are slaughtered were much greater than the corresponding calf-to-weanling scenarios and ranged from €450 in the March calving systems to €606 in the September calving systems. Total costs in this case were 28% greater for September calvers relative to March calvers. Again the length of the grazing season had a considerable impact on net margin; in this case the margin for the long grazing season was 2.5 times greater than for the short grazing season.

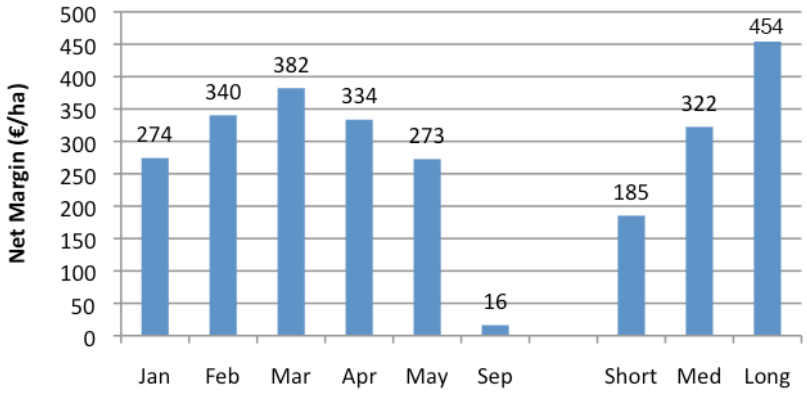

Figure 2. *The impact of calving date and grazing season length on the profitability of suckler calf-to-beef production systems. For the calving date scenarios, calving date is in the middle of each month. The modelled lengths of the grazing season are; Short 178 days, Med 212 days, Long 243 days. Assumptions: CAN €320/t, Urea €360/t, Concentrates €235/kg and beef price (R3 steer) €3.80/kg beef carcass.*

It is apparent from the data presented in this paper that the profitability of suckler beef cow production systems is heavily influenced by calving date and the length of the grazing season. The latter is not surprising since grazed grass can be produced on Irish farms at a much lower cost than grass silage or purchased concentrates.

The impact of calving date is due to the combined effect of the changing dietary energy requirements of the cow and the corresponding availability of low cost, high quality feed in the form of grazed grass. Following calving, the energy requirements of the cow increases considerably and therefore calving at a date that provides close synchrony with the onset of the grazing season is optimal. Calving too early (*e.g. January*) is less profitable as calved cows require higher quality (*more expensive*) grass silage and/or concentrate supplementation. Autumn-calving systems, in this analysis represented by cows calving in September, was only comparable in profitability with spring-calving systems in the calf-to-weanling scenario. A key factor in this regard was the higher price received for older autumn-born weanlings. For calf-to-beef systems, autumn-calving was much less profitable owing to a lack of the same price premium.

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Suckler cow mineral nutrition

Paul Mooney & Anne Marie Crowley

Trouw Nutrition

Summary

- Suckler cow health and productivity are influenced by correct nutrition. Mineral nutrition of the suckler cow is a key component to overall good nutrition.
- Good mineral nutrition works alongside other components of the overall nutrition, such as adequate energy, fibre and protein.
- While mineral nutrition is critical for calf health, cow health, fertility and productivity, it needs to be supported by good management and accurate diagnosis of requirements, supply and any deficiencies.

Precalving mineral nutrition:

Mineral nutrition of the suckler cow prior to calving impacts upon cow health, ease of calving and the health of the new-born calf.

While milk fever and subclinical milk fever are more an issue for dairy cows, some cases can occur in suckler cows. Milk fever and subclinical milk fever occur when the cow is unable to mobilise sufficient calcium at the time of calving to meet the increased demand. Milk fever and subclinical milk fever significantly increase the risk of other costly production problems such as lazy/slow calving, retained cleanings, ketosis, mastitis and poor fertility. In the precalving diet, restricting the level of calcium and supplying adequate levels of magnesium, improve the efficiency with which cows mobilise calcium at the time of calving. Research and farm level experience have shown that inadequate dietary supply of selenium, iodine and vitamin E during the dry cow period, increases the risk of retained cleanings in cows.

Calf health is also influenced by the mineral nutrition of the suckler cow prior to calving. Low levels of selenium and vitamin E can result in calves suffering from muscle degeneration/white muscle disease. Vitamin E and selenium work in association and both need to be supplied in adequate amounts to get the complete benefits of the other nutrient. Low dietary iodine during pregnancy has been associated with increased incidence of stillbirths, weak and listless calves, increased incidence of goitre and overall low immunity and reduced survival rate.

Post-calving mineral nutrition

Grass tetany occurs when cows have an inadequate supply of magnesium (*Mg*) circulating in the blood. Cows are unable to store magnesium, therefore a daily supply of 25-30 g Mg/day is required to prevent grass tetany. This magnesium can be supplied via feed, powder minerals, bolus, dusting paddocks or water supplementation. No one measure will give guaranteed protection, especially if the cows are exposed to a significant stressor such as very cold, wet weather. Other risk factors include grasses with high N and K and low Mg and sodium (*Na*). Changes in the diet and cows being in heat also increase the risk of grass tetany.

The factors effecting fertility in suckler cows are multi-factorial. While minerals have a role to play, they are not be the main focus as factors such as nutrition, genetics, heat detection, bull fertility, etc., all play a vital role. The main minerals involved in cow fertility include phosphorous (*P*), selenium (*Se*), copper (*Cu*) and iodine (*I*).

Mineral supply and requirements

A forage mineral analysis will give an indication of its mineral status. In recent years the levels of minerals such as phosphorus and sulphur (*S*) have declined. Some trace mineral have remained static or increased, which the supply of trace minerals such as copper and selenium have declined. The level of antagonists in the forage is critically important. These include molybdenum (*Mo*), iron (*Fe*), lead (*Pb*) and aluminum (*Al*), which inhibit the update of trace minerals such as selenium and especially copper. A blood mineral analysis will give an overview of the mineral status of the herd. While blood analysis is accurate for some minerals (*e.g. phosphorous*), it is less accurate for others (*e.g. copper*). All mineral tests, forage, blood should be used be taken as indicators and accessed in conjunction with other observations at farm level.

Management practices to calve replacement heifers at 24 months of age

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Summary

- Allow for plenty of replacements (*at least 20%*).
- Know your herd and select potential replacements while they are still calves.
- Heifer needs to be looked after the whole way along so weighing is essential in order to monitor weight gain.
- Throw everything at it! Heifers need access to the best grass, adequate feed indoors, minerals and excellent housing.
- Use easy-calving AI/bulls on your heifers.
- Calving heifers at two years of age requires dedication but, like everything in life, putting in the extra effort gives great rewards!

Introduction

My name is Margaret Lehane from Kanturk, Co. Cork. I am married to Dermot, and we have four children ranging in age from 22 to 32. I am a stay-at-home wife and farmer. We have a dual enterprise on the farm – 1st an integrated 240 sow, pig unit with almost 3000 pigs in total which Dermot manages, plus 1 labour unit. He spends almost 75% of his time in that yard whilst I and a 3-month-per-year college student look after a 70 cow suckler-to-beef unit. We farm 52 hectares – 46 ha grassland and 6 ha tillage (*this year spring barley, now treated in the shed for winter feed to young bulls*).

Outline of the system

- Calving starts in Dec., up to 15th Feb each year.
- Breeding season starts 15th Feb.
- Cows out to grass ***circa*** 17th March (*weather dependant*).
- Herd divided into males and females – 2 stock bulls.
- Early cycling cows sometimes are submitted to A.I. while indoors.
- Weaning commences late September.
- Housing in October.
- All young bulls/cull heifers finished/sold under 16 months of age.

Calving heifers at two years of age

Before I start to talk on this subject I must stress you will need:

- Interest
- Enthusiasm
- Patience, and
- Dedication

It has often been said that good cooks don't give away their secrets… but anyhow I'll share mine with you!

The most important factor is: ***Know your herd!***

Secondly, identify individual cows with:

- 365 day calving interval or less.
- Docility.
- Consistently delivers a top quality calf.
- Good conformation and milking ability.
- Tendency to have female calves rather than males.
- All round thrifty cow that's economical to keep.

These are the cows that I select my replacement heifers from – 60 to 70% of my selection is based on the **mother's** history.

I use jumbo tags to identify cows and heifers. Here is an example of how I use jumbo tags: I have three cows e.g. jumbo tag numbers 4, 15, and 21. For example, in 2008 the jumbo tag number of all replacements heifers started with 100, so the replacement heifers born from these females receive numbers 104, 115 and 121, respectively. In 2009, if these latter animals had female calves, I put jumbo tags starting with 200 on them so these replacement heifers would correspondingly be 204, 215 and 221. This is done each year just using the first figure to highlight the year. The most important information for me is contained in the two other figures 04, 15 and 21 - as these cows are exactly the perfect maternal ones I need to breed from. I am able to go back along 10 – 15 years of breeding traits for my cows by using this system with the tags.

First grazing season

Throughout the grazing season I am constantly monitoring/noting and observing my young female calves and long before I look up ICBF's Replacement Index I would have earmarked my 15 heifers (*20% rate*) approx.

Dosing and vaccinations are done routinely during the year – final outdoor one, is about three weeks prior to weaning. After weaning, all weanlings are left outside for a few weeks. Then all are brought into the yard and weighed, sorted, tail-clipped and penned.

First winter

A specially-made cubicle house is provided for my already selected 15 replacement heifers. Average weight is 360 kg. This house is bright, airy and very cosy. Cubicles have rubber mats and a generous application of sawdust is put on top to attract them up onto the cubicles. Plenty of calf ration is then laid along by the wall in front of them. They get no more feed than this concentrate for 24 – 36 hours and by then usually 100% of them are lying up. This exercise, whilst it may seem laborious, is beneficial as all my cows are on cubicles/auto-scrapers. On day 3, silage is introduced, plus 2 kg of concentrate (*once a day*).

As these livestock are very young I want to help them to grow bone and develop their reproductive organs. This is a very important area so they need a high spec mineral which I get formulated by my nutritionist. Some areas of the country are very deficient in selenium or iodine (*two very important minerals essential for good breeding*). Every autumn I do a herd blood profile and this tells me if I have any particular deficiency problems. Leave nothing to chance! I want heifers to grow and get fit rather than fat. Six weeks later all young stock have been dosed, vaccinated and weighed again. Target weight for my heifers is around 430 – 450 kg before mating. Approx. 125 days feeding @ 0.7 kg daily live weight gain = 88 kg plus original housing weight of 360 = 448 kg. Importantly, any bulling activity among the replacement heifers is chalked down on a blackboard in their shed - this all helps to keep track on fertile and maturing animals, and the dates can be used again to anticipate heat returns.

Meanwhile, I hoped to have been contacted by my AI stations to discuss suitable easy calving

sires for these heifers. NB. A.I. chiefs and indeed Teagasc are not doing enough to help us here. I feel they should keep up ongoing contact with the farmer sharing their knowledge, advice and guidance. Suckler farmers (*in contrast to dairy farmers*) are very much left to their own devices and this would be one area where A.I. personnel could visit beef discussion groups to help build up a working relationship with us. It is not good enough to tell us to use various heat detections gadgets without a hands-on meeting beforehand as wrong interpretation could be expensive.

From January onwards the level of feed is doubled to 4 kg. I allow them out to exercise in the adjoining yard and let them run through the cattle crush freely - all done to calm them and help with the handling later on. Cubicles are kept clean, topped up daily with sawdust. The combination of good feed, comfortable housing, minerals and plenty of light/space helps create a "FEEL GOOD" factor. I know from the pig side that this environment adds greatly to success rate. (*40 lux of lighting for 16 hours for sows*). Our bull is now introduced to an adjacent yard and gate, and this also helps to induce heifers into heat.

Throughout the winter months, while calving season is in progress, I am observing the heifers at numerous intervals of the day and night, so the workload is multifaceted.

Second season at grass

Magic day = Feb 15th. Any heifer on heat from now on is inseminated. If we had a package pre-arranged with A.I., the technician could give a 2nd service to ensure 100% timing. This is done routinely in the pigs. From now on these heifers are left out to the small house field where quite literally I observe them with a pair of binoculars! If I have a bulling cow or two I leave them out for an hour or so with heifers. I suggest that if you are up at any calving (*especially at dusk or dawn*) that a discreet observation on these heifers often yields results. I realise that there are plenty of other methods like a vasectomised bull, synchronisation and scratch cards and of course an easy-calving bull, which can be difficult enough to find as reliability figures are low for stock bulls.

I end up with my 15 heifers out on good after-grass and hopefully they will take their place in the herd later this year after scanning is completed.

Second winter

At housing, the heifers are moved into a cubicle house/auto-scraper where they have access to feed through "self-locking stalls". Straw and silage are fed alternatively and close monitoring is kept of their condition. Pre-calving minerals are always available to them. Hay is given during calving week. After a bonding week alone with their calves they join the other calved cows. They get about 2 kg of concentrates and even some maize silage for energy if it is available, otherwise 72% DMD silage. Post-calving minerals are dusted daily on silage from now on.

What is two year old calving worth to me?

Finally, there is a very strong advantage to calving down the heifers at two years of age – if she is capable of producing a weanling for approx.. €1000, it makes great sense to get your hands on this money as quickly as possible, rather than spending money keeping her for another full 12 months and running the risk of her going over-fat at calving.

Looking at my own profit monitor last year I achieved a gross margin of €1056/ha. I had 73 cows calving and had 72 sales with an average weight of 625 kg liveweight and a value of €1647. If I calved my heifers at 3 years of age instead of 2 years, I would only be able to carry 65 cows, so 64 sales. This would be 8 less sales at €1647 each or €13,176 in lost output. There would be some saving in meal as fewer animals would be finished. Allowing 8 tonnes saving in

meal which, at €230/tonne, would be a saving of €1840. Thus, the overall effect on my bottom line would be a reduction in profitability of €11,529 by moving from two year old calving to three year old calving!!

Final comment

Some of you may question whether my heifers survive in the herd for their second and third calvings. I allow plenty of replacements to allow for losses along the way. So I aim to fill my weanling heifer shed which takes 15 heifers. This allows me to cull cows that are empty or other problem cows. ICBF recently checked my data for me (*big thanks to Chris Daly and Ross Evans!*) Looking at heifers calved in 2008, (*calendar year*) I had 19 heifers calving for their first time. Twelve of these heifers (63%) calved in the herd for a fourth time. Comparing this to national data only 33% of heifers that calved in 2008 for the first time calved again for the fourth time! It just goes to show that it pays to look after your heifers!!

Notes

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