



Future Beef Programme

‘Feeding & Breeding’ Farm Walk



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Dromard, Co.Sligo | 12th April 2024**

Teagasc Future Beef Programme

The aim of Future Beef is to demonstrate to beef farmers how they can produce a quality product as efficiently as possible to make beef farming more profitable while also making it more environmentally and socially sustainable. Future Beef farmers are also participants in the Signpost Programme.

The whole programme hinges on our network of 22 demonstration farms. All our farmers have a very positive attitude towards suckler farming. They are willing to take on new technologies and develop efficiencies to improve profitability and reduce the negative effects of agriculture on the environment around them.

Key objectives:

- Create more sustainable and profitable farms
- Reduce greenhouse gas (GHG) & ammonia emissions
- Improve water quality
- Improve biodiversity

We will achieve this by focussing on reducing inputs and the costs of production while increasing the performance of every animal on the farm.



Acknowledgement

We wish to thank the farmers that have agreed to take part in the programme, particularly Trevor and his family for hosting this farm walk. We look forward to working with them and their local advisors over the coming years. We are confident that all parties involved in the programme will benefit hugely from the experience. We wish to acknowledge all the sponsors of the Future Beef Programme and thank them for their commitment to the programme.

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Introduction to Farm



System

- Farming 47 ha – stocked at 152 kg organic N/ha
- 50 Autumn calving sucklers + 40 yearlings purchased
- Part-Time
- Selling Bulls @ 11 months & Heifers 1.5yrs
- Mainly AI
- Carbon footprint: 11.37 kg CO₂ eq./kg beef

Key Performance Indicators 2023

- 365 day calving interval
- 1 calf/cow/year
- All heifers calving at 22-26 months
- Gross Margin Target €1000/ha by 2026
- Grassland Focus
- Growing 13 t DM/ha

Key Actions to Reduce GHG, Protect Water Quality & Improve Biodiversity

- | | |
|--|--|
| <ul style="list-style-type: none"> ▪ Improve soil fertility ▪ Incorporate clover ▪ Use all straight nitrogen as Protected Urea ▪ Use compounds like 18-6-12 + S ▪ Reduce total Nitrogen usage by >10% ▪ Use LESS to reduce ammonia losses | <ul style="list-style-type: none"> ▪ Improve genetics ▪ Improve daily performance ▪ Target 75% DMD silage ▪ Fence watercourses ▪ Hedgerow/Extensive Grazing/LIP |
|--|--|

Grazing Infrastructure & Soil Fertility

Back to basics

- Set your farm up to grow grass
- Rotational paddock grazing system
 - **6-7 paddocks per grazing group**
- Paddock size adequate for herd size

Grass10
BRISLAND COLLEGE FOR 100% 100% 100% 100%

5+ day paddocks

3-4 day paddocks

2-3 day paddocks

Each additional day at pasture is worth €2/LU!



How to Calculate Your Ideal Paddock Size

Animals consume 2% of their body weight on average. Multiply the average individual weight of your stock by 2% to get their daily demand:

_____ kg x 2%	= A (Kg demand per day)

Multiply the number of animals that you have in the grazing group by A to get the group's daily demand:

_____ (Number of animals) x A	= B (Daily demand of group)

The plan is to spend 3 days per paddock so multiply the group's daily demand by 3:

B x 3	= C (Total group demand for 3 days)

The ideal grass height for grazing is 9-10 cm. Divide C by 1400 kg dry matter per hectare (10 cm) to get your ideal paddock size in hectares:

C / 1400 kg DM per ha	= D (Ideal paddock size in hectares)

To convert into acres, multiply D by 2.471:

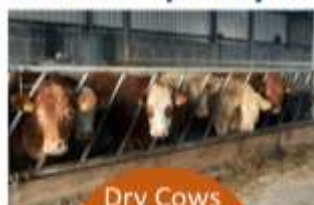
D x 2.471	= E (Ideal paddock size in acres)

Plan your Silage Strategy

1. How much silage do you need?

Fodder Required				
	A	B	C	D
Animal Type	No. stock for winter	No. months (Including a 4-6 week reserve)	No. bales required per month (at 20% DM)	Total bales of silage needed (AxBxC)
Suckler cows			1.75	
0-1 yr old			0.9	
1-2 yr old			1.6	
2+ yr old			1.7	
Ewes			0.2	
Total bales needed				_____ bales
Total tonnes needed (bales divided by 1.25)				_____ tonnes

2. What quality do you need?



Dry Cows
66 DMD
silage



Calved
Cows
70+ DMD
silage



Weanlings /
Finishers/ Ewes
74+ DMD silage

Silage pit: Length (m) x width (m) x height (m) divided by 1.4 (to allow for a silage pit at 22% dry matter)

3. What fertiliser should you spread?

Cut	1 st	2 nd
N – P – K + S advice (5 t DM/ha)		
Units/acre	80 – 16 – 100 + 15	64 – 10 – 60 + 15

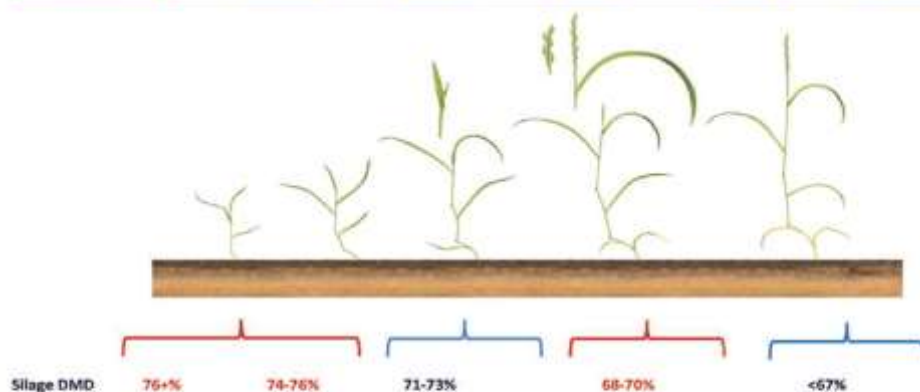
First Cut Silage Advice			
Soil Index	No slurry	+ 3000 gls/ac Cattle Slurry	+ 3000 gls/ac Pig Slurry
1/2	3.5 bags/ac 13-6-20 1 bags/ac ProUrea + S (€120/ac)	1.4 bags/ac ProUrea + S (€36/ac)	0.7 bag/ac ProUrea + S 1 bag/ac MOP (€43/ac)
3	3.0 bags/ac 13-6-20 1 bags/ac ProUrea + S (€106/ac)	1.4 bags/ac ProUrea + S (€36/ac)	0.7 bag/ac ProUrea + S 1 bag/ac MOP (€43/ac)
4	2.3 bags/ac ProUrea + S (€59/ac)	No slurry 2.3 bags/ac ProUrea + S (€59/ac)	No slurry 2.3 bags/ac ProUrea + S (€59/ac)

Cattle slurry@6% DM equivalent to 9-5-32/1000gls = €29, Pig slurry@4% DM equivalent to 19.1-7.3-17.3/1000gls = €32, 13-6-20 = €535/t, ProUrea(38%) + S = €515/t, MOP = €490/t

Plan your Silage Strategy

4. When should you cut?

Date of cutting	1/5	8/5	15/5	22/5	29/5	5/6	12/6	19/6	26/6	3/7
Grass Yield (t DM/ha)	2.92	3.99	4.98	5.96	6.79	7.82	8.48	8.93	9.50	9.83
DMD%	79.9	77.9	77.5	76.6	74.6	69.2	67.9	64.3	63.5	58.2



Factors that reduce DMD %:

- ↓ 2-3%: Each week delay in cutting
- ↓ 7-9%: Lodging
- ↓ 6-7%: Dead butt (Not grazed)
- ↓ 2-3%: Bad preservation



Take Home Messages

Not all silage is equal – Really how much poor quality silage do you need?

Cut early to avoid heading dates – good soil fertility is key here

Lodging and having a dead butt is detrimental to quality

The nutrients value in 3,000 gallons of slurry are ideally matched to the nutrient requirements of a 5 tDM/ha crop of silage
Save your slurry for silage ground

Don't forget about Sulphur, trials have show a 39% increase in yield on light soils and a 23% increase in yield on heavy soils

Why Protected Urea (NBPT)?



1. Reduce fertiliser costs by ~ 20%

- NBPT Urea 46% N = €1.20/kg N
- CAN 27% N = €1.50/kg N



200 kgN/ha
Save €60/ha

2. Reduce emissions

- Nitrous oxide
- Ammonia

N₂O by
71%

NH₃ by
78%

3. Retains more N compared to urea

- 12% more N available
- Reduce N rate by 12%



Reduce total
Emissions by
2 to 8%



Testing Slurry Using a Hydrometer

1. To take a well-mixed sample from the slurry tank it is best to agitate the tank until it is visibly well mixed. This may take 30 minutes for dilute slurry or up to a number of hours for slurry with a high dry matter content.
2. Observe the usual health and safety by ventilating the shed during the agitation and whilst taking the sample. Do not enter the tank to take the sample.
3. Suck up a load of slurry from the slurry pit using the slurry tanker and get the slurry sample from the fill point of the slurry tanker in a long 2 litre bottle.
4. Dip the hydrometer into the bottle and record the reading (Dry matter %).
5. Using the figure in the 'Dry Matter %' column below, you can estimate the nutrient content of the sample.

Table 1: Slurry Hydrometer Conversion Table for available N, P and K content

		kg/m ³			kg/1000 gals			units/1000 gals		
Slurry	Dry Matter %	N	P	K	N	P	K	N	P	K
Cattle	1	0.2	0.1	1.0	0.9	0.6	4.5	2	1	9
	2	0.4	0.2	1.4	1.6	1.0	6.4	3	2	13
	3	0.5	0.3	1.9	2.4	1.3	8.6	5	3	17
	4	0.6	0.4	2.3	2.9	1.7	10.4	6	3	21
	5	0.8	0.5	2.7	3.6	2.0	12.3	7	4	25
	6	1.0	0.5	3.2	4.4	2.4	14.5	9	5	29
	7	1.1	0.6	3.6	4.9	2.8	16.3	10	6	33
	8	1.2	0.7	4.0	5.6	3.1	18.2	11	6	36
	9	1.4	0.8	4.4	6.2	3.5	20.0	12	7	40
	10	1.5	0.8	4.9	6.9	3.8	22.2	14	8	45
Pig	2	1.5	0.4	1.7	6.8	2	7.5	14	4	15
	4	2.0	0.9	2.1	9.1	4	9.4	18	8	19
	6	2.5	1.3	2.5	11.4	5.9	11.3	23	12	23

Figures are calculated on 40% of N from cattle slurry and 50% available N from pig slurry. P and K is calculated at 100% availability. However, for slurry applied to Index 1 and 2 soils the availability of P is at 50%, therefore the value of P is taken as half the value reported.

Slurry Spreading Advice

- Slurry at 6%DM applied by LESS is worth €29/1,000 gallons and contains 9 units N -5 units P -32 units K.
- Farmers should assess their slurry storage facilities to ensure that they meet the minimum storage requirements for their county.
- The open period for slurry spreading in Co. Sligo January 16th.
- For two weeks following the opening of the spreading period slurry must be kept at least **10 meters** away from rivers, streams, watercourses and drains.
- This reverts to **5 meters** once this time period has elapsed
- Slurry cannot be spread on fields that are:
 - frozen or snow covered
 - waterlogged
 - flooded or likely to flood
 - heavy rain is forecast within 48 hours
- Maximise the nutrient content of slurry by spreading when
 - Soil temperatures are at 6°C and rising
 - Soils are trafficable and are not saturated
 - Slurry is targeted to drier fields with a requirement for P and K and have a good pH
 - Avoid applying to fields that are highly connected to the drainage network of the farm, critical source areas (CSAs), until weather conditions are favourable
 - Application rates of slurry must match growth rates of the crop



Table 2: Buffer margin for spreading of organic fertilisers from waters

Water body / Feature	Slurry/FYM/Soiled water
Water Supply > 100m ³ or > 500 people	200m
Water Supply > 10m ³ or > 50 people	100m
Water Supply < 10m ³ or < 50 people	25m
Lake shoreline	20m
Exposed cavernous or karstified limestone features (e.g. swallow holes)	15m
Any surface watercourse where the slope towards watercourse is >10%	10m
All other surface waters *	5m*

* Distance is 10m for 2 weeks before and 2 weeks after the closed period for spreading organic manures

Breeding Plans

Breeding Plans

1. Where is the herd now?



Replacement Index

Carcass Weight

Daughter Milk

Calving Interval



B. Cow & Sire Performance

	Calved in Period	No. Weighed*	Avg. Weight (kg)	Weaning Efficiency (Calf 200 Day Weight as % of Cow Weight)	
				Your Herd	Target
All	50	48	579	45%	42%
1st Calvers	6	6	464	55%	42%
2nd Calvers	8	7	565	45%	42%
3rd + Calvers	36	35	602	43%	42%

2. Define the farm system

- What is your target market?
- What type of animal is required for this market?
- What traits are required to produce that type of animal?


How ?

- Look at the mother / heifer
- Look at the Eurostar report
- Decide on a Terminal or Replacement bull

Terminal

Animal Details				Replacement Index				
Jumbo	Animal Tag	Sire ID	Dam Tag	Index Value (€)	Rel %	Carcass Weight (Kg)	Daught. Milk (Kg)	Daught. Calving Interval (Days)
	Date Of Birth			Across Breed Stars	Herd Rank	Across Breed	Across Breed	Across Breed
562	IE321552010562 31-AUG-2016 SA(50%),BB(25%)	SA2153	IE321556180081	€186 ★★★★★	66% 16	+16.3 ★★★	+10.9 ★★★★★	-1.9 ★★★★★

POTTLEREAGH MARK CH4160



Eurostar Index					ICBF Jan. 2023					Calving Difficulty				
Within Breed	Index	Euro-Value	Rel.	Across Breed	When Mated With:	Value	Rel.	When Mated With:	Value	Rel.				
★★★★★	Replacement	€140	87%	★★★★★	Beef Heifers	7.9%	91%	Beef Heifers	7.9%	91%				
★★★★	Terminal	€137	92%	★★★★★	Beef Cows	4.1%	99%	Beef Cows	4.1%	99%				
Expected Daughter Performance					Expected Progeny Performance									
Within Breed	Index	Euro-Value	Rel.	Across Breed	Within Breed	Index	Euro-Value	Rel.	Across Breed					
	Daughter C.D.	2.25%	81%		★	Docility	-0.02	99%	★★					
★	Dr Milk (kg)	-5.50	92%	★	★★★	Carcass Wgt	33.9kg	99%	★★★★★					
★★★★★	Dr C.I. (Days)	-8.14	67%	★★★★★	★★★★	Carcass Cond.	2.00	99%	★★★★★					

Cow and Bull Management

What Factors influence Breeding Performance on Farm?

One of the key aspects of running an efficient suckler system is good breeding management and herd fertility. Cow condition score, bull fertility, the incidence of difficult calving and herd health are some of the main factors that affect fertility in the herd. Good reproductive efficiency is central to economic and environmental sustainability.

Cows Body Condition Score (BCS):

Body condition score at calving needs to be at a herd average of 3.0 for spring calvers as this allows for 0.5 of a B.C.S loss up to start of breeding season. At the start of the breeding season a cow needs to be on an increasing plane of nutrition with a BCS of 2.5 to give her the best possible chance of going back in calf.

Thin cows that are in poor condition or lose a lot of weight post-calving will have a delayed return to heat. The effects of low BCS at calving are only partially reversed by placing cows on a high plane of nutrition after calving. Extra feeding after calving will not compensate for poor BCS at calving. Cows on poor BCS 1.75 will not cycle until 71+ days after calving while cows in good BCS 3.0+ will be cycling by day 55.

Avoid fluctuations in feed supply around breeding. Keep cows on a rising plane of nutrition

Restricted suckling:

If possible, restricted suckling of calves in the morning and evening (from 4 weeks of age) will help break the maternal bond between cow and calf. This practice helps improve cow's/heifers condition coming into the breeding season and cows will return to heat cycle quicker.

Health Issues:

A number of infectious diseases are known to affect a cow's ability to produce a live calf, breed successfully, and subsequently carry a healthy calf to full term. Any issues with herd health need to be checked out fully in consultation with your vet in advance of the breeding season. Uterine infections can significantly delay the onset of cycling. If a vaccination programme is currently in place it should be reviewed and updated in consultation with your vet. Ensure cows receive all vaccinations 3 weeks prior to breeding.

Ensure cows are dosed for parasites if necessary - Fluke & Worms prior to breeding.

Avoid stress around the time of breeding. Ensure cows are in a socially stable group. Avoid mixing cows from different groups during the breeding season especially 1st calved heifers.

Calving Difficulty:

Difficult calving greatly increases the incidence of reproductive problems in the following breeding season and also reduces calf survival. When selecting sires, a good rule of thumb is to use bulls that

are <7.5% on the new calving difficulty rating and high reliability >70% on heifers. For mature cows, the calving difficulty varies according to breed from 6.2-11.5% which is available on the ICBF ready reckoner available on the ICBF website.

Bull Fertility

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

Key Points:

- Bulls must be able to maintain body condition score (ideally BCS 3), repeatedly mount and serve cows and place fertile semen in the cow for 12 weeks and have a long working life in the herd.
- Good libido is important, especially in larger herds or in difficult terrain so that the bull is active in seeking out and successfully serving all cows in heat.
- Quarantine new bulls for 4 weeks after purchase for health screening and acclimatisation.
- Avoid sudden changes and do not overfeed as this can reduce fertility and lead to feet problems.
- Check feet and legs well in advance of the breeding season, as good locomotion is essential for getting cows pregnant. Take remedial action if required.
- Provide exercise where possible (e.g. site feed and water at opposite ends of the shed or field).
- Check that the scrotum circumference and that they have no deformities.

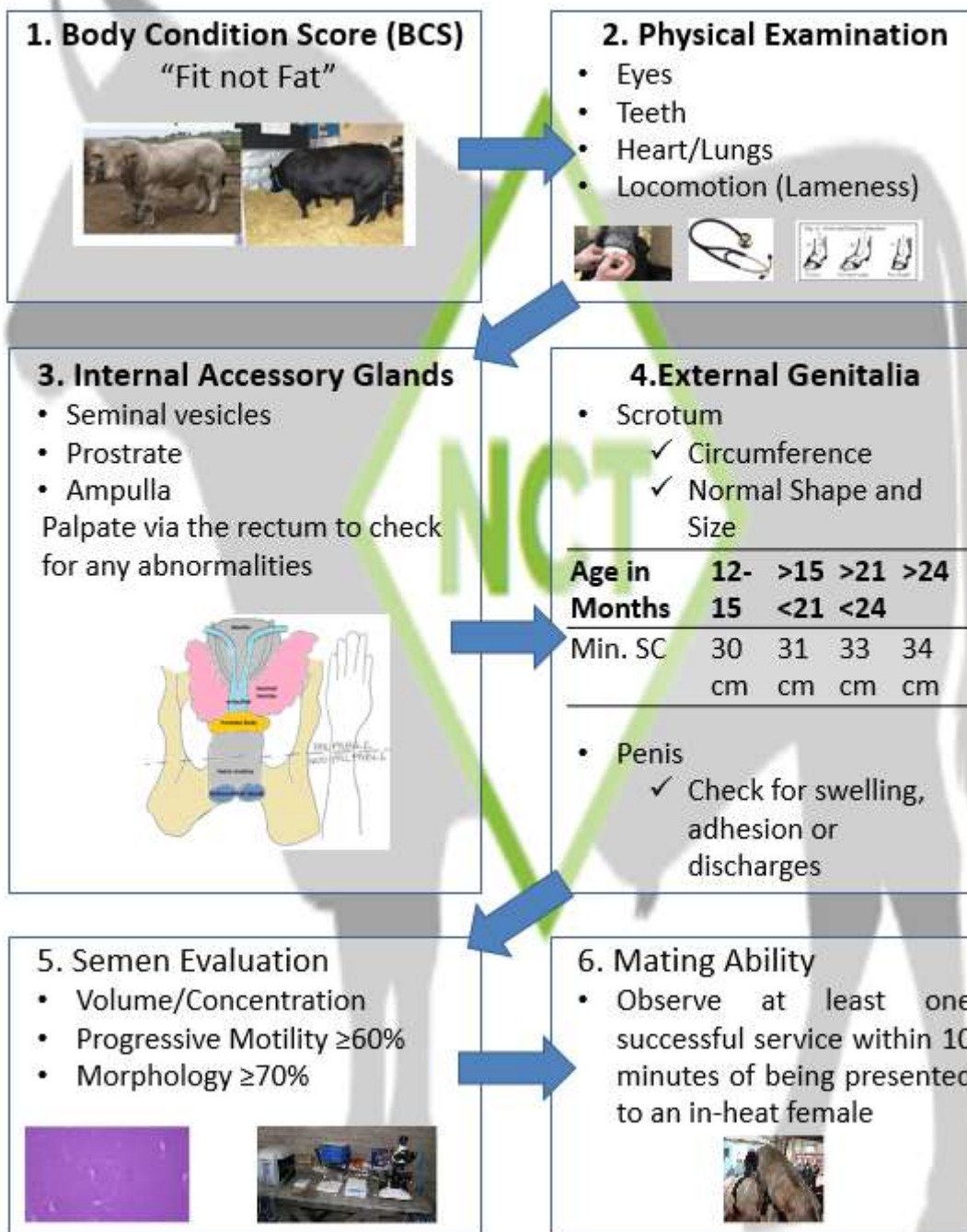
Table 3: Minimal scrotal circumference of breeding bulls by age

Age in Months	12-15	15 -21	21 -24	>24
Min. Scrotal Circumference	30 cm	31 cm	33 cm	34 cm

- Check penis for swelling/discharges etc.
- Ensure all vaccinations are up to date
- Approximately 25% of all working bulls are sub-fertile or infertile. Your vet can fertility test your bull 6-8 weeks pre-breeding.
- Socialise a new bull with the cows/heifers.
- Watch the bull working to check he is serving cows correctly.
- Rotate bulls or scan cows early so that an infertile bull or sub fertile bull can be identified early. Even bulls that have passed a breeding soundness examination can go lame or suffer reduced fertility during the breeding season.
- Record when you see a cow being mated and watch for signs of cows coming on heat repeatedly.
- Don't overwork a young bull (15 cows maximum for first season)
- A mature bull can handle up to 40 cows.

Bull NCT

Bull Breeding Soundness Evaluation (BBSE)



Oestrous Synchronisation or Timed Insemination

In Ireland, less than 20% of calves in beef herds are bred from AI. Such low usage of this effective technology most likely reflects the difficulty and labour requirements for heat detection, assembly of cow(s) for insemination as well as land fragmentation in beef herds. Synchronisation is a process that aims to reduce the labour requirement and make AI more accessible to beef farms

What is Heat Synchronisation?

Simply put 'oestrous or heat synchronisation' is the process of manipulating the oestrous cycle of the cow by the use of synthetic hormones in order to better manage the timing of breeding.

Why should a farmer consider using synchronisation?

- So he/she can plan the dates to best suit the availability of labour on the farm
- With timed AI all cows can be bred on a predetermined day, regardless of whether they showed heat or not
- It can also be used to induce heat in anoestrous cows. However, conception rate achieved at the induced heat in such cows is generally lower than cows that are cyclic, fertility at subsequent repeat heats is normal (55-70%)
- Increasing the use of AI means you can have a more targeted breeding policy
- You can use more bulls of higher genetic merit
- You can have a more focused replacement policy
- It helps to shorten the breeding season and compacts the following calving season
- For larger herds the need for a number of natural service bulls can be reduced and thus the quality improved

How does it work?

In order to develop and test a robust and repeatable timed AI program for Irish suckler beef farmers, Teagasc conducted a large on-farm trial, which involved timed AI of over 2,200 cows on 85 herds throughout the length and breadth of Ireland. The protocol in Table 1 (below) is the outcome of this work. An overall pregnancy rate of 55% to the timed insemination was achieved, which is very acceptable considering that in the region of 50% of the treated cows were anoestrous (had not resumed normal heat cycles) at the start of the regimen. When combined with repeat breedings, 80% of synchronised cows

were pregnant in the first three weeks of the breeding season, which obviously has very positive benefits for average herd calving interval and the subsequent calving season.

Table 4: *Recommended synchronisation regimen for beef cows ≥ 35 days calved at time*

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday
Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10
10am							10am			10am
Prid in + (GnRH optional)							Prid Out PG + eCG	Record heats	Inseminate cows – evening	Continue to inseminate <u>Or</u> Fixed time AI -72hrs after prid removal + GnRH
								Cows will show standing heat in evening - record	Most heats expected	

Notes

- All drugs are Prescription Only Medicines (POMs) and are under veterinary control.
- Dosage of drugs: will vary according to drug and drug formulation.
- Inadvertent administration of prostaglandin to a cow/heifer during the first 3-4 months of pregnancy will cause abortion.

For best results with oestrous synchronisation in beef cows, it is recommended 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.
- Synchronisation should only be used in herds where the level 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 7-10 days following the initial AI.

It is vitally important that high fertility semen is used and the competence of the inseminator is high. Semen must be thawed carefully (15 seconds in water at 35°C) and the

cow inseminated within 1-2 minutes of thawing. The correct site for semen deposition is in the common body of the uterus. Each straw should be thawed separately.

Synchronisation regimens for replacement heifers

As the vast majority of replacement heifers should be cyclic during the breeding season there is a reduced requirement for incorporating an exogenous source of progesterone in the regimen for heifers. Consequently, prostaglandin-based regimens are the method of choice for use on replacement heifers. A very cost effective regimen involves good heat detection initially carried out for 6 days and all heifers detected in heat inseminated. On the 6th day all heifers not yet detected in heat are injected with prostaglandin. The injected heifers will respond to the prostaglandin and show heat 2-4 days after injection and should be inseminated as normal; conception rates of 65 to 70% should be expected. The remaining heifers not yet recorded in heat and inseminated can be treated with a 2nd prostaglandin injection 10-11 days (see Figure 1) after their initial injection. Up on 80% of the heifers will respond to one or either injection of prostaglandin. Using this protocol drug use, semen costs and veterinary costs are minimised.

Table 5: Alternative prostaglandin-based regimen for replacement heifers

Monday – Sunday	Tuesday	Thursday to Saturday		Thursday	Tuesday
Day 0-7	Day 8	Day 10 - 12		Day 19	Day 23
Detect heat and inseminate as normal. Should have 1/3 inseminated	Inject heifers not seen in heat with PG	Detect heat and inseminate for 5 days	Heifers should respond to PG injection in 2-4 days Conception rates of 65 -70% expected	Inject all heifers not seen in heat or inseminated to date	Detect heat and inseminate for 6 days 80% of heifers should be inseminated after the 2nd injection
	Inject Prostaglandin (PG)			Inject Prostaglandin (PG)	

Fixed Time A.I. in Heifers

There is an option to use a PRID/CIDR device in heifers using a similar protocol to what was outlined for the cows. The options are to: i. Heat detect and AI as normal, any heifers not showing heat inseminate at 72-84 hours after device removal and administer an injection of GnRH; OR ii. Avoid heat detection and inseminate all heifers at 55-60 hours after device withdrawal. GnRH must be administered at insemination. This approach will ensure a 100% submission rate and induce ovulation in some non-pubertal heifers. Pregnancy rates of over 70% have been achieved at Grange, to a single timed insemination in 15-16 month old beef heifers using this regimen.

It is imperative that heifers are bred to easy calving sires, as dystocia or calving difficulty can be four-fold higher in heifers than in more mature cows.

Fixed time AI for heifers					
Monday Day 0	Saturday Day 5	Sunday Day 6	Wednesday Day 9	Day 22	Day 23
Prid in + <u>Inject GnRH</u>	<u>Inject PG</u>	Prid Out + <u>Inject PG</u>	Fixed time AI - 72hrs after PG + <u>Inject GnRH</u>	Heifers can be AI'd 72 and 96 hours after second PG	

List of Products used:

- PG Prostaglandin- *Estrumate, *Lutalyse, *Enzaprost.
- GnRH- *Receptal, *Ovarelin.
- ecG- *Folligon PMSG, *Synchrostim

Idea of costs (2023) – this will depend on your vet and the number you are orderings

- Cidrs x 10 €99.67
- Prids x 10 €88.78
- Receptal x 5 €113.82
- Estrumate x 5 €211.14
- Folligon x 5 €181.38
- Cidr Applicator x 1 €13.36
- Prid Applicator x 1 €13.36
- Kamar Heat Patches x 50 €82.52

Heat Detection Aids

Observe Heats and Record

It is crucially important that you observe your cows/heifers and record their heats in a notebook or on an App. If you see your cow/heifer being served by the bull or with A.I and in 18 + days, you see her bulling again it may be indicative of a problem, depending on the percentage of repeats. If you pick up the issue early, you can put a solution in place early.

Vasectomised bull

A vasectomised bull fitted with a chin ball is a very easy method of heat detection. It will work on both cows and heifers. The chin ball allows you to see if a cow/heifer has been in heat, even if the bull is not with her, therefore reducing the instance of missed heats. It is important that a vet vasectomises the bull, ensure it is done eight weeks before the breeding season and ideally check it has been successful.

- Ensure your vasectomised bull is well grown. He will be working hard over a short period and you want him to be able to mark the cow on the back.
- Fit the chin ball a week before it is need to allow the bull to familiarise himself with it.
- You can pad the pad the neck and nose strap with to prevent the strap cutting the bull.
- Ensure the chin ball is well fitted to the bull. If it is leather, it will need to be adjusted.
- When ready to start the breeding season, fill the chin ball with paint. One fill should suffice for 10-15 heats
- Have your bull ringed for safety and convenience when refilling the chin ball.
- Only use chinball paint in the chinball. It is a heavy oil base and needs to be well shaken before topping up.
- Red or blue paint is most obvious so use in wetter conditions.
- Avoid overfilling the chinball and ensure the plug is secured correctly.
- The bull marks the cows on the back when he is serving them. Position yourself to see the marks on the backs of the cows. A young bull will mark cows a lot on the side when he is courting her, older bulls much less. It is the marks on top of the back that are key.



Tail Paint

- Apply to the tail head
- Ensure area is clean & dry, brush loose hair
- Apply paint on a dry day
- Apply in a narrow strip 1.5 – 2in wide
- When paint is rubbed off you have standing heat



Scratch Cards

- Apply to clean dry hair on a dry day
- Brush hair, do not clip
- Apply half way between the tail and hip
- Keep cards are glue dust free
- The grey will be rubbed off to show colour



Automated heat detection systems

- Moo Heat – Vasectomised bull with collar, cows have tags
- Sense Hub – Cows tagged/collar
- Others available

Sexed Semen

Why use sexed semen?

Sexed semen has become a more viable option for herds in recent years. Developments in the sexing technology, herd trials which show improved conception rates and the introduction of two sexed semen labs in Ireland have increased the availability sexed beef straws for suckler farmers this spring.

The advantages of using sexed semen are:

- 90% chance of a heifer calf.
- Can breed replacements early in breeding season.
- Genetic gain.
- Can breed more cows to a terminal sire to increase beef output on the farm.

While sexed semen will provide an excellent opportunity to herds, it does come with challenges. Some of the disadvantages are:

- Lower conception rates (85% of conventional rates).
- Much smaller breeding window after heat is detected.
- Slightly higher cost.

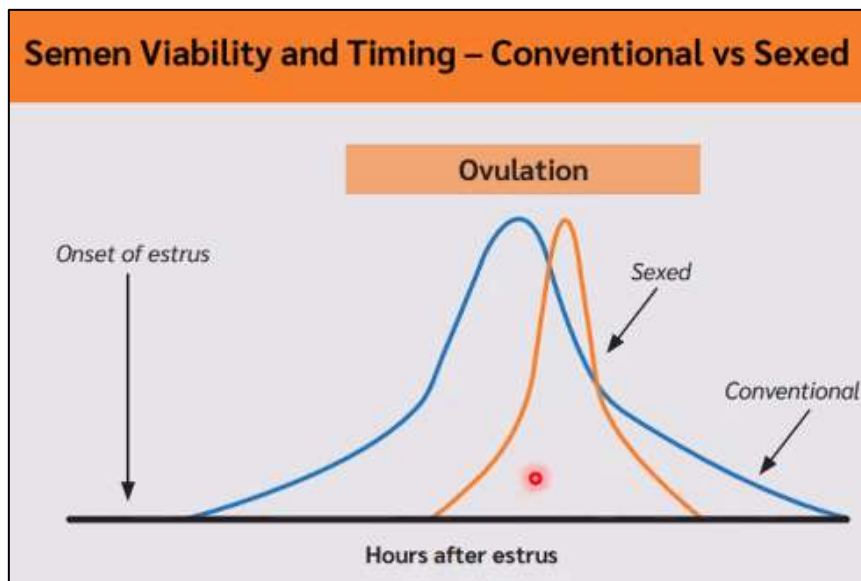


Figure 1: Semen viability and timing – conventional vs. sexed

Steps for success with sexed semen

It is recommended that sexed semen insemination should be restricted to the first 3 weeks of the breeding season so that the herd calving spread is not negatively affected. Some other main points to consider are outlined below.

1. Herd suitability. You should;
 - Have used AI successfully in the past.
 - Have a fertile herd, i.e. >70% 6 week calving rate, 356 day calving interval, >0.95 calves per cow per year.

2. Choose your females carefully. They should;
 - Be your most fertile females that have calved in the first half of the breeding season.
 - Be >35 days calved.
 - Have cycled more than once before breeding.
 - Have had less than 4 calves.
 - Heifers should be at target body weight for breeding, e.g. over 400kg for continental heifers.
 - Have a body condition score of 3.
 - Be on a good plane of nutrition with no sudden changes in their diet before or after breeding.

3. For replacements, pick a bull that;
 - Has a higher replacement index than your herd index at over 70% reliability.
 - Has a positive daughter milk figure.
 - Has a negative daughter calving interval figure.
 - Has a daughter calving difficulty figure of less than 8% at >70% reliability if being used on heifers.
 - Note that not all sexed bulls are going to breed suitable replacements for your herd so make sure to choose them carefully.

4. Communicate with your AI technician
 - Let them know that you are planning to use sexed semen and to check if they will have the flexibility to call when needed.
 - Discuss what AI straws you want to use to ensure they are available.

5. Heat detection (NB – Crucial for success)
 - Frequent observation is essential – 20 minutes 4-5 times per day is recommended.
 - Heat detection aids such as tail paint, kamars, scratch cards, vasectomised bull with a chin ball etc. should be used.
 - Automated heat detection options such as tags, collars and boluses are also available.



6. Timing of AI
 - 14 to 20 hours after heat onset (first standing mount).

- Practice AM/PM rule if possible.
- If using once a day AI, use conventional semen if time of AI is <14 hours after heat onset.
- **Table 6: Recommended breeding times for sexed semen**

Day 1: Onset of heat between	Time of AI
01:00 to 07:00	21:00 - Same day
08:00 to 13:00	06:00 - Next day
13:00 to 19:00	09:00 - Next day
16:00 to 22:00	12:00 - Next day
19:00 to 01:00	15:00 - Next day
22:00 to 04:00	18:00 - Next day

7. Straw handling

- Ensure the AI straws are easily identified in the flask if doing DIY AI, ideally in a single goblet.
- Thaw a maximum of 2 straws at any one time.
- Thawing time is a minimum of 45 seconds at 35-37°C.
- Ensure the straws are fully dry before insemination.
- Load straws into a pre-warmed AI gun and keep it warm.
- Deposit semen into the uterine body.
- Use the thawed straws within 5 minutes.

How many sexed semen straws do I need to use?

In a suckler herd of 30 cows with a replacement rate of 20%, 6 female replacement heifers will be needed per year. The expected conception rates for sexed semen in heifers is 60% and 50% for cows for the first serve.

If sexed semen is only used for the first 3 weeks of the breeding season and the 6 heifers are bred, you would expect a conception rate of 60%. Allowing for 90% sex bias towards heifers, you would expect to produce 3 replacement heifers from sexed semen. Heifers that repeat can be served again with conventional semen from a maternal bull.

Three further heifers are required to be produced from the suckler cows in the herd. Allowing for 50% conception rates and a 90% sex bias, 7 cows will have to be bred to sexed semen straws.

This means that 13 sexed semen straws are required in the herd to produce 6 replacement heifers. Note that this does not allow for any embryo loss, abortions or mortality after birth.

Calving Beef Heifers at 2 Years of Age

The percentage of beef heifers calved at 22-26 months of age nationally stands at 23%. This is compared to 74% of dairy heifers that calve at the same age.

What are the benefits to calving heifers at 2 years of age?

- Calving at a younger age means that breeding females have the opportunity to produce more calves over their lifetime.
- There will be a lower stocking rate on the farm than if older heifers are being carried as replacements.
- By getting your genetically superior heifers to calve down younger, you will get faster genetic improvement into your herd and can further improve this by breeding replacements from your best heifers and cows.
- If you calve your heifers at an older age, it will cost you €50/heifer/month in a 50 cow herd for the extra unproductive time she spends on the farm until calving.
- Heifers that calve at 24 months can reduce the Greenhouse Gas emissions produced on your farm by 4-5% vs. calving at 32 months of age.

How can you calve your heifers at 2 years of age?

- If you are breeding your own replacements, your replacement heifers should be identified early. These can be selected based on the following criteria;
 - ✓ Visual assessment: The heifer should have good feet and legs, which can also be assessed from her dam if possible. She should have a good frame too, particularly in the pelvic area but care should be taken that she is not too well muscled either as this can cause difficulties later at calving if she is small.
 - ✓ Weight for age: She should be gaining over 1.1 kg/day from birth and have a 200 day weight of over 250kg.
 - ✓ Eurostar index: Heifers should be genotyped as 4 or 5 star on the replacement index, with positive figures for milk and docility, and negative figures for calving interval.
 - ✓ Family history: The heifer should have a good milky dam that is docile and fertile. The sire should have positive figures for daughter milk and a negative figure for daughter calving interval.
- You should examine on your ICBF weaning performance report what the average weight of your cows are, and this will help to determine what the mature weight of your heifers will be. Based on this information, performance targets should be set as with the table below.

Table 7: Performance targets for calving heifers at 24 months

Performance targets for calving at 24 months				
Stage	Age (mths)	ADG (kg/day)	Target Weight (kg)	How is this achieved on farm
Birth	0		45	
Weaning/Housing	8	1.1	275-300	- Good grass management - High milk in cows
Turnout	12	0.6	335-375	Good quality silage + meal
Bulling	14	1	380-420	- 60% of mature bodyweight - Early turnout
Housing 2nd winter	20	0.8	540-570	Good grass management
Calving	24		550-590	- 80% of mature bodyweight - In correct body condition
Overall Lifetime ADG required		0.72		

- Heifers should be well fed over the first winter as they will have to gain between 60-80 kg to ensure they meet their weight targets. The silage on the farm should be tested and they should be given >70% dry matter digestibility (DMD) silage. Their diet should be balanced with ration as appropriate to ensure that there is adequate energy and crude protein for them to gain 0.6 kg/day over the housing period.
- Replacement heifers are priority stock on the farm and should be turned out to grass early in spring to help them settle at grass before breeding commences and so that they will reach their target weights before breeding at 15 months of age.
- When breeding the heifers, the bull selection is crucial. The bull's heifer calving difficulty should be less than 8%, with over 80% reliability to reduce the incidence of difficult calvings.

Pre-calving care for heifers

Over their second winter, heifers should be monitored closely. They should be dosed and vaccinated as necessary to ensure that they have no health setbacks which could impact their performance.

They should have a body condition score (BCS) of over 2.75 to ensure that they are fit and not fat at calving. If they are lower than this, there will be a slower return to breeding, the cow will be weaker at calving and the colostrum will be poorer. On the other side, if BCS is higher than 3.0 the cow will have greater difficulty calving and re-breeding could be delayed.

This can be assessed by handling cows for fat cover on the edge of the loin bones (transverse processes) and on the tail head and ribs. At a condition score 3.0 and greater, loin bones cannot be felt so focus on the tail head and the fat cover over ribs.



Figure 2: *Body condition score examples*

It is very easy for maiden heifers to be bullied by older cows when they are in the shed, which can cause injuries and affect their feed intakes. Ideally they should be housed in a separate pen to prevent this from happening, and to ensure that they have enough feeding and lying space.

As with all heifers, they should be supervised at calving.

Post calving care for heifers

After calving, heifers should be given good quality feed to help them meet their energy demands. If housed indoors, they should be given over 70% DMD silage and at least 2kg ration. They should be turned out to grass as early as possible to give them a chance to build condition before breeding again.



Notes



A to Z of FARM SAFETY



A

Always consider **SAFETY** on the farm.

B

BULLS: Beware of aggressive animals on your farm. Be sure to cull cross bulls, cows, rams, stags from your farm.

C

CHILDREN: Always supervise children on the farm, especially during machinery operations.

D

DRAWBARS: Never let anyone ride on the drawbar of your tractor or any other machinery. Do not allow anyone ride in an open trailer.

E

ELECTRICITY can kill. Beware of overhead power lines and buried cables.

F

FORESTRY and tree felling: Take care not to be caught under falling trees and logs. Attend a chainsaw and tree felling course.

G

GAS: Slurry gases can kill. Remove all stock from slatted sheds before agitating. Never enter a shed when slurry is being agitated. Close agitation point after each use.

H

HORSES: Some horses can be dangerous. Always wear safety equipment e.g. helmet when handling or riding horses. Be wary of being kicked by horses.

I

INSPECT: Check safety equipment on your farm regularly, e.g. machinery safety covers, PTO guards, fire extinguishers and First Aid kits.

J

JAWS: Keep away from blades of shear grabs, mowers, revolving knives and chainsaws.

K

KEEP CLEAR of machinery such as tractors, HiMacs, bulldozers when they are working. Stay in their line of vision and wear a high visibility jacket or vest.

L

LIVESTOCK: Be wary of being kicked or crushed while working in pens, yards or fields with livestock.

M

MACHINERY: Ensure safety covers and PTO guards are in place and working on all farm machinery. Avoid wearing loose clothing near machinery.

N

NEVER start a tractor when you are standing on the ground alongside it.

O

OVERTURN: Remember tractors have a high centre of gravity and can overturn easily. Drive slowly over uneven ground.

P

PESTICIDES and other toxic chemicals: Keep them out of the reach of children. Read the label and follow the manufacturer's advice on proper use, storage and disposal.

Q

QUAD bikes: Always wear a safety helmet when using a quad bike. Avoid letting children on them. Drive slowly over rough ground.

R

ROOFS: Use a roofing ladder when working on farm sheds. Stay clear of skylights.

S

SAFETY: Complete and update your Risk Assessment Document. This can be completed online at www.farmsafely.com. Take action on risks highlighted.

T

TRAINING: Attend a Farm Safety training course **NOW** at your local Teagasc centre.

U

UNTIDY: Poorly maintained farmyards/farm can lead to accidents. Keep your farmyard/farm neat, tidy and well maintained.

V

VISION: Your eyesight is vital – protect it. Wear safety goggles where your eyes are in danger.

W

WARNING SIGNS should be erected to warn the public of dangers or hazards such as "Tractors Crossing", "Beware of Bull".

X

XTRA: Be extra careful when there are children or elderly people on the family farm. Restrict access to dangerous ponds, tanks, unstable heights etc.

Y

YOU and YOUR FAMILY: Take every precaution to remain safe and healthy. Assess every farm task carefully for potential dangers or risks. Organise and complete tasks with safety in mind.

Z

ZOONOTIC DISEASES and infections which can be transmitted from animals to humans. E.g. TB, Toxoplasmosis, Weil's Disease, E.Coli ... Wear gloves when handling livestock. Always wash your hands after being in contact with animals.



Thank you for your attention and safe home!