Future Beef Programme

National Beef Farm Walk

Eamon & Donnchadh McCarthy's Farm

Carrigeen, Youghal, Co. Waterford | 26th July 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 23 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 to Eamon, Donnchadh and their 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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1. Introduction to Farm

Figure 1: *Farm layout*

- 45.59 owned ha in 3 blocks
  - 29.22 ha permanent grass
  - 11.8 ha SAC
  - 4.57 ha spring barley
- **31** spring & **19** autumn suckler cows
- 100% AI, breeding own replacements & calving them at 24 months
- Grassland stocking rate 2023 (adj.): **2.13 LU/ha** or **162 Kgs N/ha**
- Carbon footprint: **11.11 kg CO2e per kg live weight gain**

Table 1: *Finishing performance 1st July 2023 – 1st July 2024*

Finishing Performance (1st July 2023 – 1st July 2024)			
	Age at Finish (Months)	**Finishing Performance**	**Price/head**
Heifers (12)	22.5	323kg, R=3-	€1586
Young bulls (44)	15.3	403 kg, U=3=	€2148
Cows (10)	55.9	357kg, R-3+	€1494

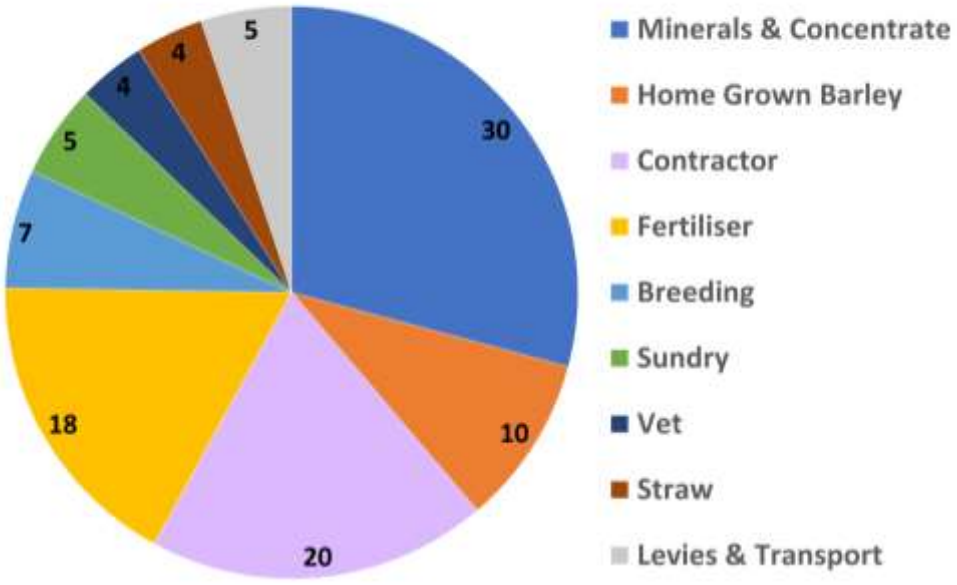
2. Cattle Financials

Measure	2021	2022	2023	Target 2026
Output/LU (Kg)	380	407	433	~433
Stocking Rate (LU/ha)	1.84	2.13	2.13	2.26
Output/Ha (Kg)	698	867	920	~1,000
Gross Output (€/Ha)	€1,442	€2202	€2,579	€2,303
Variable Costs (€/Ha)	€780	€1,443	€1,642	€1,152
Variable Costs (% of gross output)	54%	66%	63%	~50%
Gross Margin (€/Ha)	€662	€759	€937	€1,151
Fixed Costs (€/Ha)	€489	€534	€772	€772
Net Margin (€/ha exc. premia)	€173	€225	€165	€379

Plan is to:

- Increase output/LU through use of better genetics
- Option to use sexed male AI straws
- Reduce variable costs by improving weaning performance, silage quality & winter performance
- Increasing feed & lying space

Average Variable Costs 2023 (%)



3. Soil Fertility Improvements

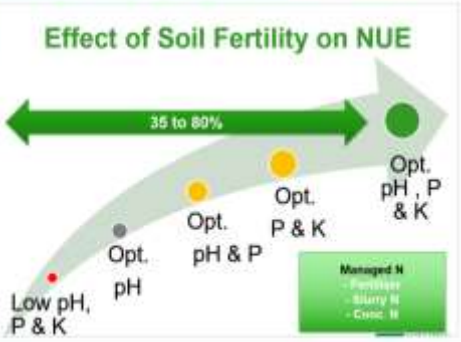
Measure	% of farm optimum 2022	% of farm optimum 2024
pH (above 6.2)	32%	95%
Phosphorus (P) at Index 3	38%	79%
Potassium (K) at Index 3	58%	65%
% Farm optimum for pH, P & K	0%	48%
Grass grown (t DM/ha)	10.38	12.49 (2023)

How?

- ✓ 133t lime spread
- ✓ Spread 18-6-12 + S and 13-6-20
- ✓ Spread MOP & pro urea + K

- ✓ **Soil Sample**
- ✓ **Spread Lime**
- ✓ **Target Slurry**
- ✓ **Replace P, K & S offtakes**
  - Grazing takes 82-8-12+16 units N-P-K+S/acre
- ✓ **Build up P + K Indexes**
  - Index 2: + 8 units P + 24 units K/acre
  - Index 1: +16 units P +48 units K/acre

NMP



4. Paddock System

✓ Grow more grass ✓ Identify surplus/deficit of grass ✓ Protect re-growths

1. Paddock Size

- Every 1 tonne animal live weight requires 0.05 ha for 3 days
  - 30 cows + calves x 0.75 t (combined pair weight) = 28.5 t
  - Plus 21 yearlings x 0.45 t (average) = 9.5 t
- Ideal paddock size = 38 t x 0.05 ha = 1.9 ha
- Actual average paddock size is 1.35 ha

2. Infrastructure

- Water trough location & size
  - ✓ Locate away from gaps & watercourses
  - ✓ 5 - 7 L trough size per livestock unit (90 gallons on this farm)
- Reels & temporary fencing

3. Excellent Grass Management

- Turnout late Jan/early Feb & house in Nov (spring/autumn planner)
- Measuring grass to match grass growth to demand
- Grazing paddocks at correct heights & removing surpluses as silage

5. Fodder Planning

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. How much silage have you made?

Fodder Available	Total bales
Bales in yard	
Pit silage = Length ___m x width ___m x height ___m x 1.25	
Expected yield = ____ acres x ____ bales/acre	
Total bales available	_____ bales
Surplus/deficit	_____ bales

3. What are your options if you are short?

Reduce feed demand:

- Have you finishing stock that can be fed now at grass?
- Scan 5 weeks after breeding finishes & cull unproductive cows
- Wean early
- Sell stock

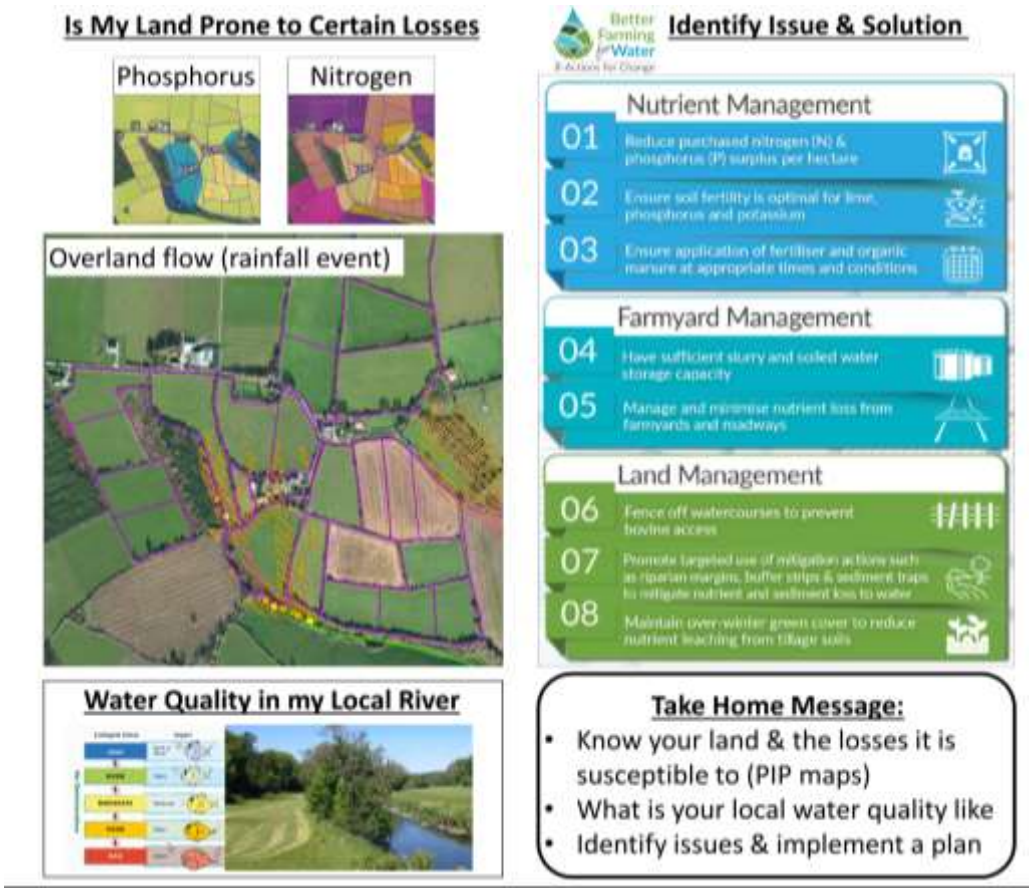
Increase feed supply:

- Can you take a third cut from some land?
- Can you buy in feed?
  - Or replace silage with ration – but very dependant on cost - check out Teagasc relative value of feeds calculator
- Could you grow a forage crop on tillage land?
  - Need to consider lie back area, water & minimise poaching
- Can you rent land for grazing / silage?

Other points to note

- Don't ignore the risk of an early winter or late spring – safer to over-budget
- Spread fertiliser in early August to help build autumn grass
- Will cash flow be an issue for you this winter?

6. Water Quality



7. Breeding Strategy

1. Where is the herd now?

€126

Herd Replacement Index (Cows)

13 (Kg) Carcass Wgt

7.7 (Kg) Daught Milk

-1.61 (Days) Daught Calv Int

0.05 Docility

- Calving at 24 vs. 36 months
- 7% Carbon Footprint
- Net Profit/LU by 33%

200 Day Weights

	Male Calves Kg/day	Female Calves Kg/day
2021	1.34	1.17
2022	1.23	1.12
2023	1.12	0.97

Breeding KPI's

Year	Calving interval (days)	Mortality at 28 days (%)	Calves per cow per year	% heifers calved 22-26 months	Spring / Autumn 6 week calving rate
2021	363	2.6%	0.98	100%	93% / 100%
2022	355	0%	1.01	59%*	100% / 100%
2023	373	4%	0.96	100%	100% / 89%
2024	382	5.9%	0.9	100%	100% / 95%

2. Look at cow traits

Animal Details				Replacement Index				
Jumbo	Animal Tag / Date Of Birth / Breed	Sire ID / Dam Tag	Calvings	Index Value (€) / Across Breed Stars	Rel % / Herd Rank	Carcass Weight (Kg) Across Breed	Daught. Milk (Kg) Across Breed	Daught. Calving Interval (Days) Across Breed
0785 1	372123103807 85 19-FEB-2023 SI(50%),CH(25%)	SI4147 372123103605 93		€156 ★★★★★	50% 27	+26 ★★★★★	+6.9 ★★★★★	-3.52 ★★★★★
0682 2	372123103406 82 07-FEB-2021 AU(50%),SI(25%)	AU4683 372123103406 25	2	€185 ★★★★★	52% 7	+18 ★★★	+7.3 ★★★★★	-5.57 ★★★★★
482 3	IE351310860482 14-JAN-2015 AA(72%),HO(22%)	GJB IE151198990451	8	€48 ★	61% 88	+1.6 ★	+6.3 ★★★★	-3.03 ★★★★★

Maiden heifer

- Calving difficulty?
- Calving difficulty reliability?
- Docility? -0.01

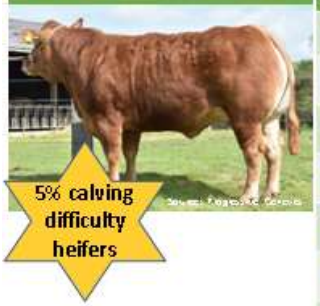
Balanced cow

- Terminal or maternal bull?
- Docility? 0.07
- Aim to maintain traits

Unbalanced cow

- Terminal or maternal bull?
- Aim for higher carcass weight & replacement index

3. Pick bull

Erebos LM6172 Cow C.D. 1.7% @ 95% rel	Star rating across breed	Economic Index May 2024	€ value per progeny	Index reliability
	★★★★★	Rep. index	€192	74%
	★★★★★	Terminal index	€138	83%
	★★★★	Carcass weight	23.9 kg	91%
	★★★★★	Carcass conformation	1.92	89%
	★★★	Age at finish	-1.6 days	81%
	★★★★★	Daughter milk	+9.8 kg	78%
	★★	Daughter calving interval	0.55 days	49%
Shannon Stan LM9379 Cow C.D. 2.9% @ 70% rel. 	★★★★★	Rep. index	€189	48%
	★★★★★	Terminal index	€171	50%
	★★★★★	Carcass weight	33.5 kg	47%
	★★★★★	Carcass conformation	2.55	45%
	★★★	Age at finish (days)	-1.39 days	65%
	★★★★	Daughter milk	+4.5 kg	46%
	★	Daughter calving interval	2.49 days	38%
Tullyvillage Shane CH8535 Cow C.D 7.3% @ 83% rel. 	★	Rep. index	-€4	52%
	★★★★★	Terminal index	€131	54%
	★★★★★	Carcass weight	42.4 kg	48%
	★★★★★	Carcass conformation	2.27	48%
	★	Age at finish (days)	2.37	67%
	★	Daughter milk	-7.3 kg	49%
	★	Daughter calving interval	1.76 days	46%

Match bull to cow

Watch for calving difficulty

Reliability is Key

8. Stages of Autumn U16 Month Bull Beef

Stage 1: Aug. - March

- Properly wean a heavy calf
- ADG 1.3kg +
- Should be eating meal pre-housing
- 375 kg at turnout
- Vaccinations & dosing programme

Compact Calving

Stage 2: April - July

- Excellent grass management
- Target 1kg/day until housing
- Feed 2kg/day ration pre-housing
- Routine
- Away from bulling females

Stage 3: Aug. – October

- Silage + ad lib ration/barley mix
- Ensure balanced diet (Energy, fibre & protein)
- Health – FEC samples
- 500kg+ at housing
- 680-700kgs at finishing
- Fat class 2+

500kg @1yr

- Reduce age at finish by 1 month
- 8% Carbon Footprint
- Net Profit/LU by 20%

Stage	2022 Born Bulls (6*)	2023 Born Bulls (11)
Birth - 5th Aug	45 kg	45 kg
Housing - 26th Nov	208 kg 1.37 kg ADG	N/A
Weaning - Spring	335 kg (2nd Apr) 1.18 kg ADG	235 kg (24th Feb) 0.92 kg ADG
Summer - 15th Jul	442 kg 1.13 kg ADG	388 kg (18th Jul) 0.98 ADG
Birthday - 4th Aug	490 kg 1.2 kg ADG	
Final weight - 30th Oct	671 kg 1.37 kg ADG	
Finishing Performance – 15th Nov	397 kg, U-3= at 15.5 months, €1926/head	

*Must discuss with your factory agent before changing to a bull beef system

9. Stages of Spring Autumn U16 Month Bull Beef

Stage 1: Feb - Oct

- Properly wean a heavy calf
- ADG 1.3kg +
- Should be eating meal pre-housing
- 350 kg at housing
- Vaccinations & dosing programme

Compact Calving

Stage 2: Nov- Jan

- Housing environment
- Top quality silage
- 2kg to 6kg of meal
- Target 1.3kg/day until 500kg
- Routine

>70% DMD

Stage 3: Feb-June

- Silage + ad lib ration
- Ensure balanced diet (Energy, fibre & protein)
- 680-700kgs
- Fat class 2+

500kg @1yr

10.Eamon & Donnchadh's Herd Health Plan

<table>
<tr><th>Vaccinations</th><th>Dosing</th></tr>
<tr><td>✓ Leptospirosis (Apr)
➢ 2 shot programme for heifers
➢ Annual booster for cows
✓ Rotovirus, Coronavirus & E. coli
➢ 1 shot for spring cows 3-12 weeks pre-calving
✓ 5/25 positive in blood test – now vaccinated based on vet advice</td><td rowspan="2">✓ Using AHI Beef HealthCheck reports

✓ FEC sampling yearlings & stores
➢ July/Aug if coughing (lung & GI worms)
➢ September(lung & GI worms)
➢ At housing (lung & GI worms, fluke)

✓ FEC sampling cows
➢ In autumn (rumen & liver fluke)

  </td></tr>
<tr><td>Minerals</td></tr>
<tr><td>✓ Administering bolus
➢ Helps to supplement low selenium & iodine on the farm
➢ Also contains cobalt
✓ Magnesium supplementation to prevent grass tetany
➢ Spring
➢ Sept/Oct</td><td></td></tr>
</table>

11. Environmental Regulations

Round Bale Storage from 2023

In the absence of effluent storage facilities, including farmyards, bales should be;

- Stacked at a maximum height of **two bales**
- Stored **>20m** from surface water

Buffer Zones from Watercourses

- 3m for the application of chemical fertiliser
- 3m for arable crops (6m for late harvested crops)
- 5m for slurry spreading
  - Increases to 10m for first 2 & last 2 weeks of permitted spreading season

12. 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 €54/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 carbon footprint on your farm by 7% vs. calving at 36 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 2: *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 3: *Body condition score examples*

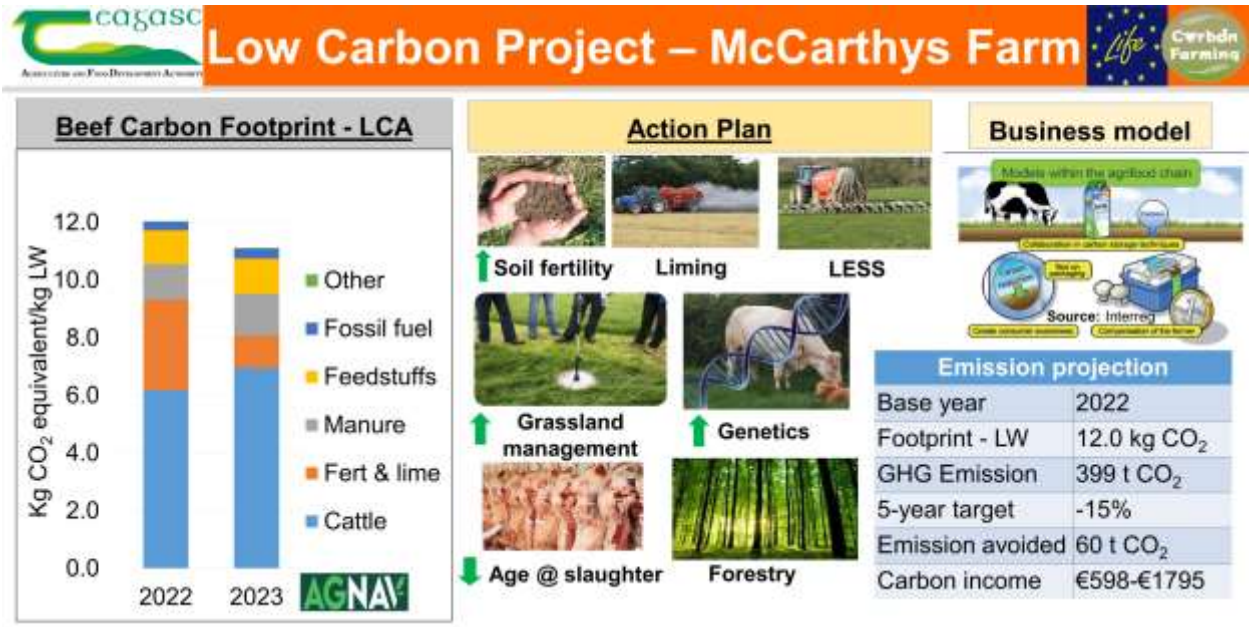
It is very easy for maiden heifers to be bullied by older cows when they are in the shed, which can cause injuries and affect their feed intakes. Ideally they should be housed in a separate pen to prevent this from happening, and to ensure that they have enough feeding and lying space.

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

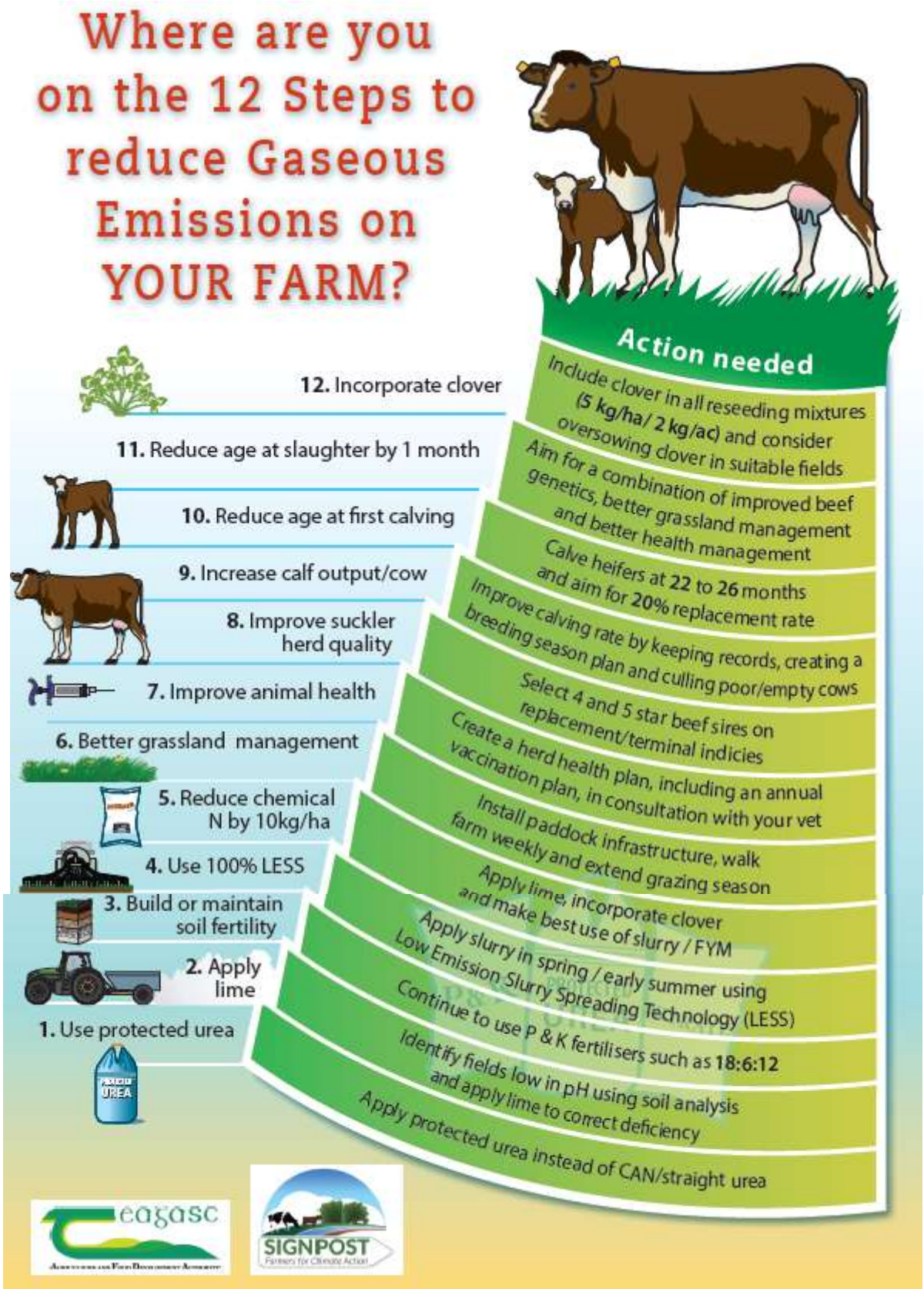
Post calving care for heifers

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.

13. LIFE Carbon Farming Project



14.12 Steps to Reducing Emissions



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.

REMEMBER: HEALTH IS WEALTH. THINK SAFETY. BE SAFE!

Thank you for your attention and safe home!