AgriSearch Beef Farm Walk

AFBI, Hillsborough

Wednesday 10th September 2014

Working in partnership with industry

Farm Walk

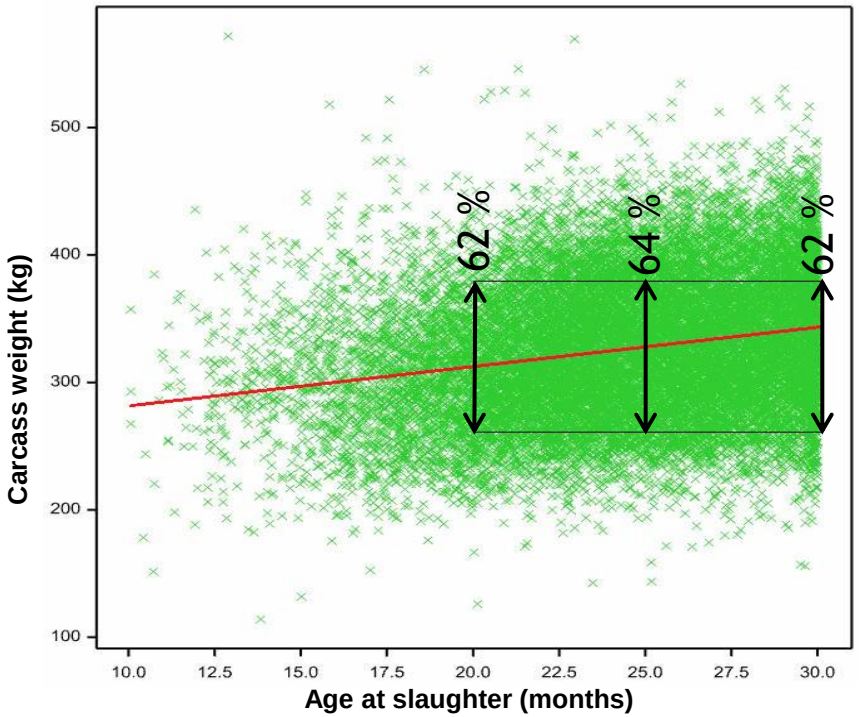
- **Main topics**
  - Bovine Information System (BovIS)
  - How to achieve 24 month calving?
  - Suckler cow genotype comparison
  - How do we manage body condition score?
  - Grassland management
  - Dairy-origin beef production
- **Additional topics**
  - Animal health
  - Winter feeding options
  - Health & Safety and Rural Support
  - Herd fertility
  - Benchmarking

Carcass gain- room for improvement

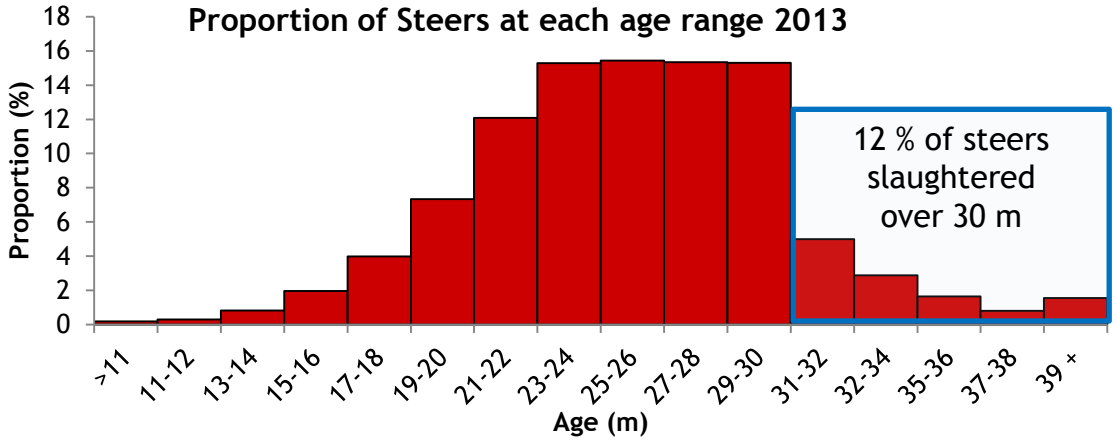
Beef production in Northern Ireland

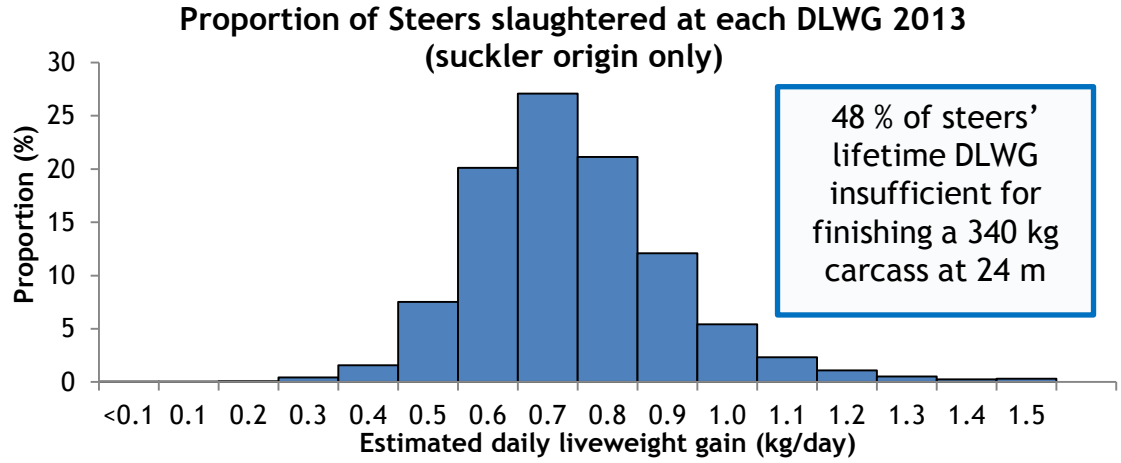
- Large variation in carcass weight at all ages
- Possibility to reduce age at slaughter whilst maintaining slaughter weight

Variation in steer carcass weight in BovIS plants 2013*



*Figures denote proportion of steers at selected age achieving in spec weight





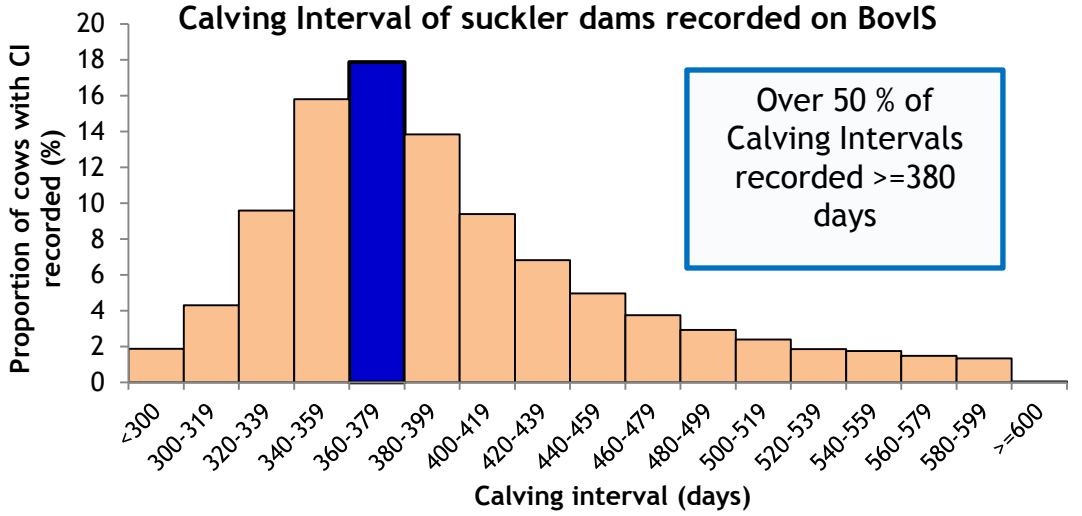
Do you know your carcass gain figures? To find out, download a copy of the BovIS user guide (Carcass benchmarking application):
http://www.agrisearch.org/publications/farmer-booklets

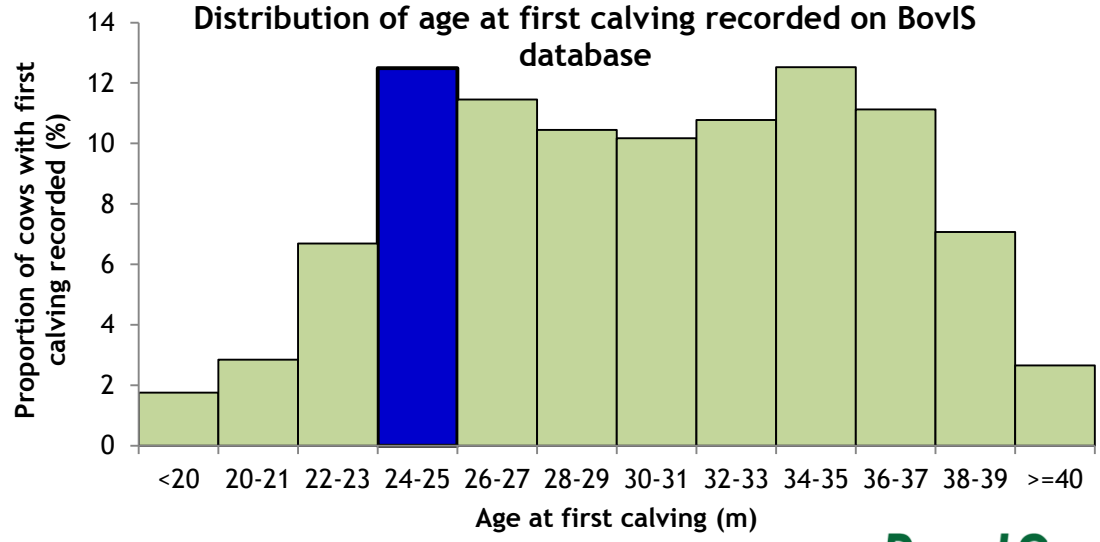
Reproductive performance: room for improvement

Current reproductive performance in NI (2013)

- Reproductive performance poor compared with optimum levels
  - Calving interval of most common suckler dams average 415 days
  - Age at first calving on average 30.6 months

COMMON REASONS GIVEN FOR NOT CALVING AT 24M	
"Calving at 24 months requires a high level of management"	"Heifers are not mature enough at 14-15 months to bull"
"Heifers that calve at 24 months cannot compete with the cows in the herd"	"Heifers that calve at 24 months never grow properly into cows"
"Calving at 24 months is expensive as you have to feed high levels of meal"	





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Driving reproductive performance on Northern Ireland suckler farms

Which management practices led to better fertility?

Superior herd fertility found amongst producers who:

- had a health plan in place (e.g. Multiple vaccinations or regular health procedures on breeding bulls)
- monitored condition score
- selected sires on EBVs rather than visual appearance
  - multiple criteria when selecting sires
- used the Hillsborough Feeding Information System (silage analysis) and/or CAFRE benchmarking
- aimed to serve/ calve heifers at younger ages

Average (range) of farms sampled in the survey		
Number breeding females		85 (8-453)
Farm size (ha)		64 (14-280)
Proportion of land type (%)	Lowland	67 (4-100)
	DA	66 (8-100)
	SDA	86 (5-100)

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Benefits of reducing calving interval

Benefits of moving from Calving index 415 days(NI Average) to 380 days for a 50 cow herd

Labour efficiency

- Not calving all year
- One group of calves - similar size
- Bull with one group
- Easy to keep track of cows fertility

Selling weanlings

- Calves on average 35 days older at sale

35 x 1kg x £2.00/kg x 44 calves

£3,080

Feeding

- Save 35 extra days x 50 feeding an empty cow

1,750 days x 80p/day

£1,400

Output

- 415 days = 44 calves / year
- 380 days = 48 calves / year

4 calves a year

£1,000

Benefits of reducing age at first calving

(24 months v 36 months)

Gains		Costs	
Additional calf sold at 1 yr old	£ 700	Increased meal feeding to heifer & calf	-£125
1 less year of dry heifer feeding	£ 280		
Managing 1 less batch	?	Overwintering extra calf	-£180
	+£980		-£305
Gain per heifer = £ 675			

Total financial benefit:
+£135/cow/year
(Assuming a replacement rate of 20%)

Other concerns	Experiences of AFBI herd and CAFRE Hill Farm
Smaller Cow	No significant reduction in size if well managed after 1st calving
Calving Difficulties	Use a bull with proven easier calving – no significant problems
Not getting back in calf	No effect on later fertility if well managed after 1st calving

Managing a herd to improve fertility

Cow management

- Body condition score
- Calving difficulty / infections
- Fertility diseases & minerals – vet not rep

Bull management

- Housing, feeding, fertility check

Planning

- Timing- health checks, condition scoring, service period –taking the bull out
- Scanning/ culling
- Adequate supply of suitable replacements

Rearing suckler herd replacements

Bulling weight 60% mature weight at 14 months

Calving weight 90% mature weight at 24 months

Age (months)	Weight (kg)	Target growth rate (kg/d)	Nutrition requirements
3	137	1.0	Suckling cow & grass
6	228		
9	292	0.7	Grass silage plus 1-2 kg conc
12	356		
14	399		Grass
18	485		
21	536	0.6	Grass silage plus min/vit
24	588		

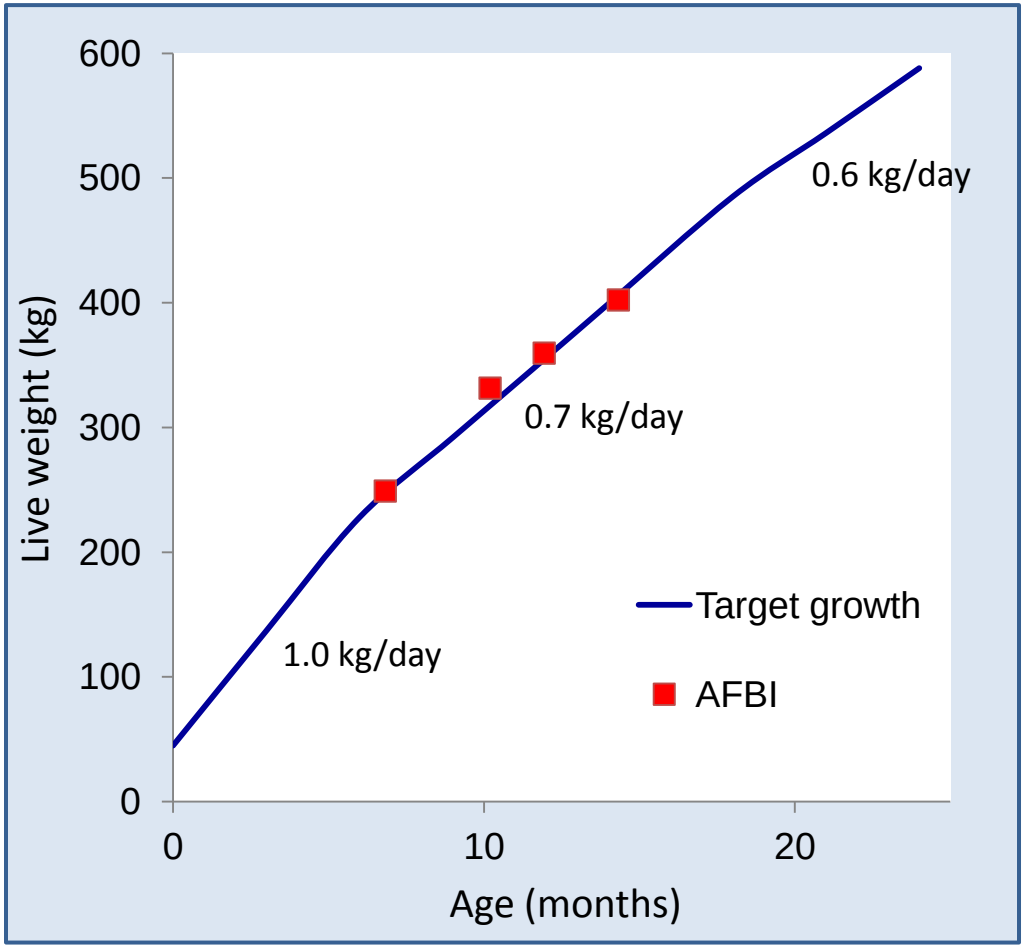
- High growth rates are not required
- Key is to monitor performance and condition score

AFBI replacement heifers

Rearing regime and monitoring performance

- Selection criteria
  - Good temperament
  - 60%+ mature weight at 14 months
- Health status
  - Vaccinations complete pre breeding
  - Lepto, BVD, Schmallenberg virus
- Nutrition (weaning – calving)
  - Grass silage + 2 kg concentrate
  - Rotationally grazed
  - Grass silage + min/vit
- Breeding (>380 kg)
  - Synchronized + AI
  - Easy calving sire

Monitoring performance



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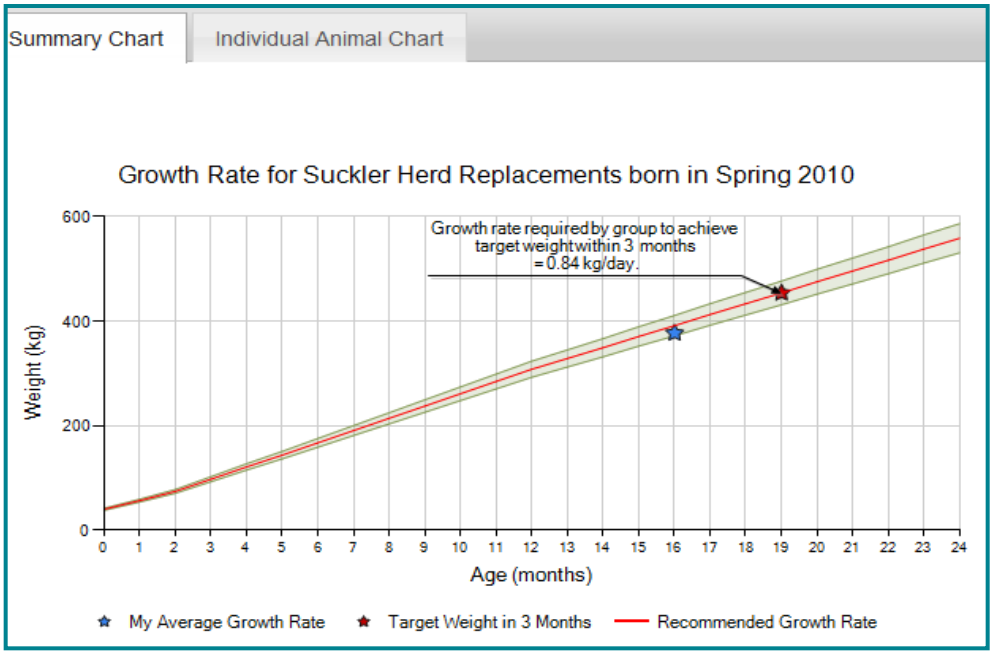
Online growth monitoring

BovIS

- Online tool to aid growth monitoring
- Animal list and ages supplied by APHIS
- Weights automatically plotted against target



Animal Type: Suckler Herd Replacements

Age at first calving: 24 months

Mature Cow Weight: 620 kg

Calving Weight: 558 kg

Animal Tag No	Sex	Breed	Date of Birth	Age (months)	Weight (kg)
UK 9 390002 8274 4	F	Aberdeen-Angus	10/02/2011	17.2	400
UK 9 390002 8282 5	F	Charolais	15/02/2011	17.0	440
UK 9 390002 8284 7	F	Charolais	20/02/2011	16.9	405
UK 9 390002 8286 2	F	Aberdeen-Angus	28/02/2011	16.6	395
UK 9 390002 8290 6	F	Aberdeen-Angus	09/03/2011	16.3	350
UK 9 390002 8291 7	F	Stabiliser	11/03/2011	16.2	300
UK 9 390002 8292 1	F	Charolais	12/03/2011	16.2	410
UK 9 390002 8294 3	F	Aberdeen-Angus	14/03/2011	16.1	390
UK 9 390002 8295 4	F	Aberdeen-Angus	19/03/2011	16.0	305
UK 9 390002 8296 5	F	Charolais	20/03/2011	15.9	350
UK 9 390002 8297 6	F	Charolais	22/03/2011	15.9	350
UK 9 390002 8300 2	F	Stabiliser	23/03/2011	15.8	430
UK 9 390002 8707 3	F	Charolais	10/04/2011	15.2	395
UK 9 390002 8708 4	F	Charolais	12/04/2011	15.2	410
UK 9 390002 8711 7	F	Stabiliser	22/04/2011	14.9	400
UK 9 390002 8710 6	F	Stabiliser	26/04/2011	14.7	300

Synchronisation and AI

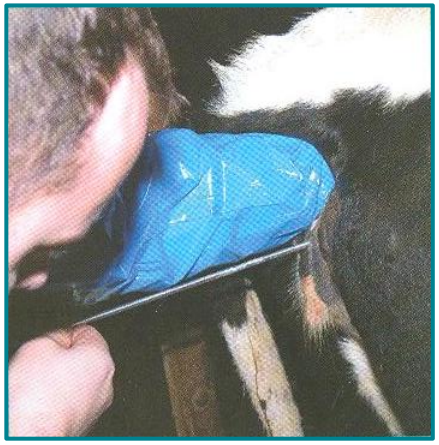
Potential benefits

Synchronisation

- Controlled breeding
- Ensure heifers produce their first calf early in the season
- Batch calving of heifers
- Time/labour saving – heat detection & handling
- Cost – £35-40 (dependent on protocol) plus AI charge & semen
- Conception rates (40 – 70 % to first service)

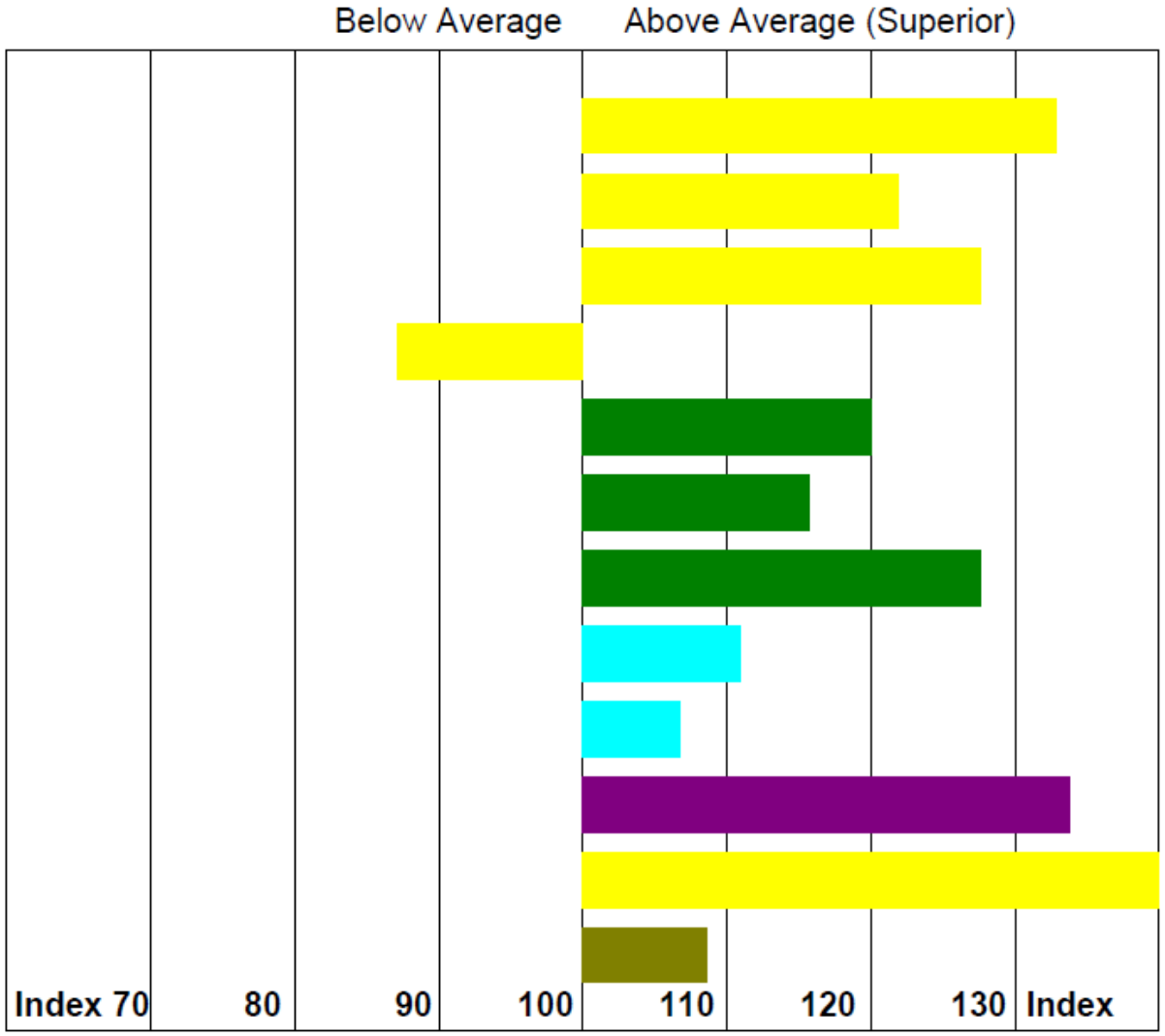
AI

- Bull selection (potentially superior genetics)
- Proven sire with high EBV's for: calving ease direct
  birth weight
  gestation



Selecting a suitable sire

Estimated breeding values (EBV's) – Givendale Norseman



Analysis date: 22/06/2014	EBV	Acc %
Gest. Length (days)	-3.1	48
Birth Weight (kg)	-1.9	68
Calving Ease (%)	1.8	62
Mat.Calv. Ease (%)	-0.4	35
200 Day Milk (kg)	5	44
200 Day Growth (kg)	26	74
400 Day Growth (kg)	65	73
Muscle Depth (mm)	2.1	72
Fat Depth (mm)	0.4	65
Beef Value	39	74
Calving Value	7	60
Maternal Value	15	35

AFBI Suckler Cow Herd

Current Research Project

Evaluation of mid & late pregnancy feeding strategies for managing body condition score of spring calving suckler cows and their subsequent reproductive and progeny performance

- **Current total of 94 suckler cows**

42 LimxFr cows

Replacement heifers sourced from the dairy herd

All cows crossed to **Stabiliser**

43 Stabiliser cows

Selected for ease of care, good fertility and maternal traits

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Stabiliser v LimxFr Dams

Maternal traits

No effect of dam breed on:

- Cow temperament score
- Calving difficulty score
- Mothering ability score
- Calf vitality score

However Body Condition Score higher in ST than LimxFr

Table 1. Cow and calves

	2013		2014	
	LimxFr (n=50)	ST (n=33)	LimxFr (n=47)	ST (n=44)
No. of cows died	1	0	5	1
No. of difficult calvings (no. of Caesarean Sections)	7 (0)	5 (2)	8 (0)	9 (1)
Calf mortality: at birth by weaning‡	1 1	2 3	0 2	1 2
Calves weaned/ 100 cows	96.0	84.8	93.6	90.9

‡Up to 8th September for 2014 data

Table 2. Measures of fertility

	2013		2014	
	LimxFr	ST	LimxFr	ST
Calving interval (days)	388	392	380	388
No. of cows in extended calving interval (>450 days)	3	0	0	2
Calving period (days)	131	97	129	128
No. of cows in extended calving period (>90days)	7	3	5	6

Improving Herd Fertility:

- Improve Heat detection
- All cows AI'd in 2014
- Synchronisation programme

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Progeny Performance

Table 3. Up to weaning

	Dam breed	
	Lim x Fr	ST
Liveweight (kg) - at birth - at weaning	 42.0 279.9	 38.1 247.1
DLWG Birth to weaning (kg/d)	1.14	1.01

Table 4. Weaning to turnout

	Dam breed	
	Lim x Fr	ST
LW at turnout (kg)	384.2	370.4
LW gain weaning to turnout (kg)	109.1	122.3
DLWG Weaning to turnout (kg/d)	0.70	0.79

2014 Grazing:

- Out to grass on Monday 14th April 2014
- Aim for average of 1kg LWG/d over grazing period

Table 5. Finished cattle

- Previous study compared entire male progeny from Stabiliser and Charolais bulls

	Breed		
	CH x (LimxFr)	ST x (LimxFr)	ST
Birth weight (kg)	48.2	44.4	42.1
Calving difficulty score	3.09	1.69	2.52
Carcass weight (kg)	328	306	295
Conformation	7.6	7.5	7.9
Fat	7.3	7.6	7.3

Key messages

Results to date suggest that the Stabiliser cow is a comparable alterative to the cross-bred Limousin x Friesian cow, in terms of fertility and maternal traits

Stabiliser v LimxFr cows

Fertility and maternal traits

Potential profit of progeny

Depends on your system:

- **Sold as weanlings-** calves from LimxFr cows were 32.8kg heavier than those from Stabiliser cows, resulting in potentially £73.80 increase in selling value.
- **Sold as stores-** live weights not significantly different
- **Sold finished-** carcass value not significantly different

Greenhouse gas (GHG) emissions

Methane research at AFBI

Measuring methane emissions from beef cattle using:

SF_6 technique →

← Calorimetric chambers

- Emissions correlated to feed intake: increase intake > increase digestion > increase emission
- But, performance must be considered as emissions per kg of product is the key
- **Methods to reduce GHG emissions include:**
  - calving at 24 months
  - improved fertility
  - high weaning efficiency
  - reducing slaughter age

Improved production efficiency is key!

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Energy metabolism of suckler cows

Management of body condition score

- Consumed feed (energy) is partitioned as follows:
  - heat production
  - faeces
  - urine
  - methane
  - milk production
  - retained energy

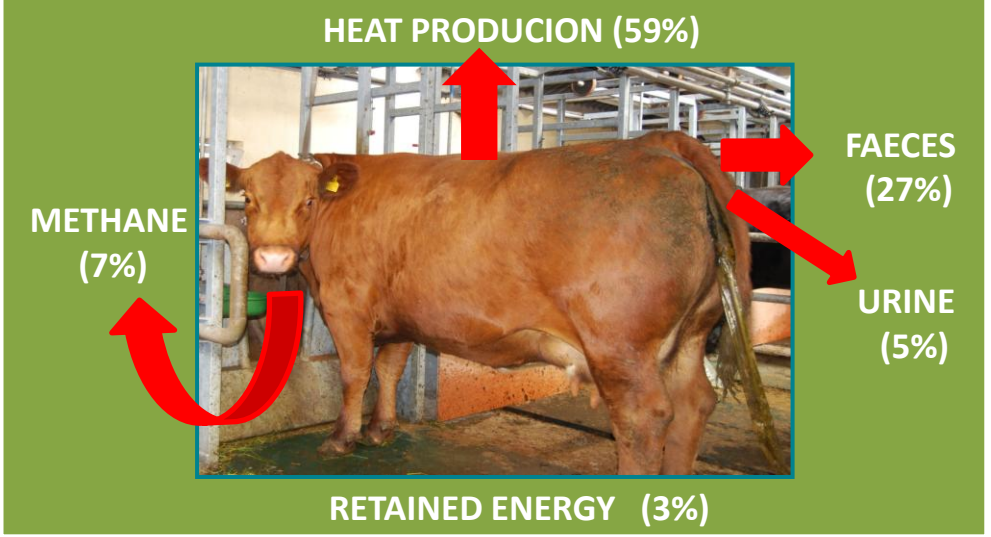
  } GHG

- The energy we supply in the form of feed is required for:
  - maintenance
  - milk production
  - pregnancy
  - body condition score

  ↓ Decreasing priority

- Two genotypes similar energy metabolism
  - dry period
  - lactating

PARTITION OF ENERGY IN DRY SUCKLER COW



Relative to Limousin x Holstein the Stabiliser cows have:

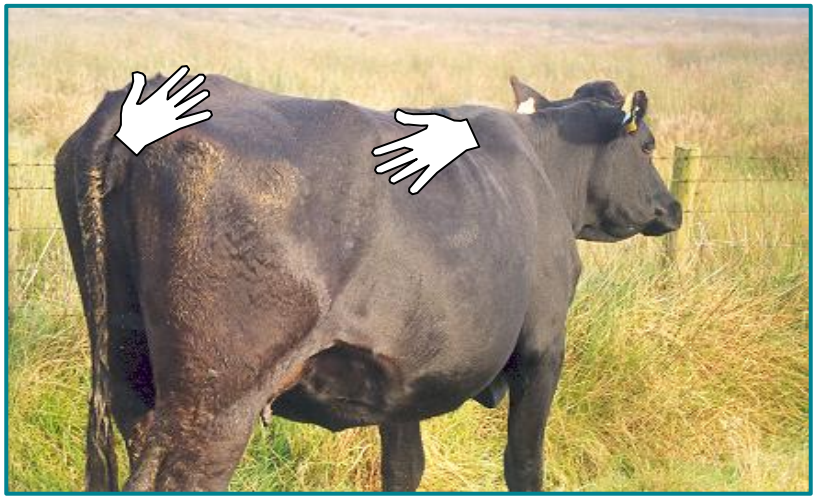
- Similar grass intake
- Lower milk yield
- Lower calf weaning weight
- Higher body condition score

Body condition score

How to assess body condition score

- Under utilised on many farms
- Is used to achieve a balance between:
  - economic feeding
  - good production
  - good welfare
- Handle cows to properly assess body condition score at:
  - calving
  - service
  - weaning
- Body condition score can impact on:
  - feed requirement
- 1 unit body condition score
  = 70 kg of live weight (600 kg)
  = 1800 MJ
  = 1 tonne silage or 250 kg barley

Condition score 2



Condition score 3

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Body condition score

Importance for fertility

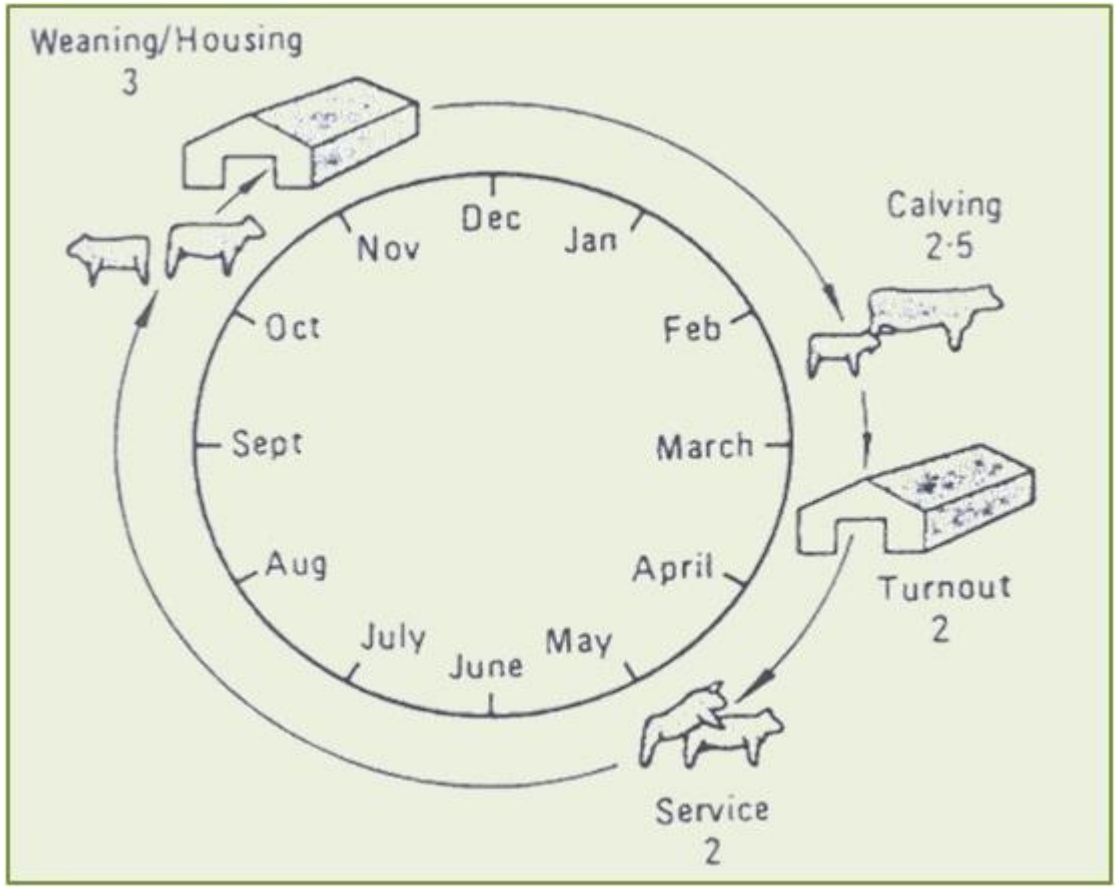
- Body condition score can impact on:
  - fertility

BCS at calving	Days to first heat
1.75	57
2.5	43
3.50	48

BCS at calving	Calving interval
1 – 1.5	418
2	382
2.5-3.0	364

Drennan & Berry (2006)

Target for spring calving herd



Body condition score

Practical methods to utilise body condition score

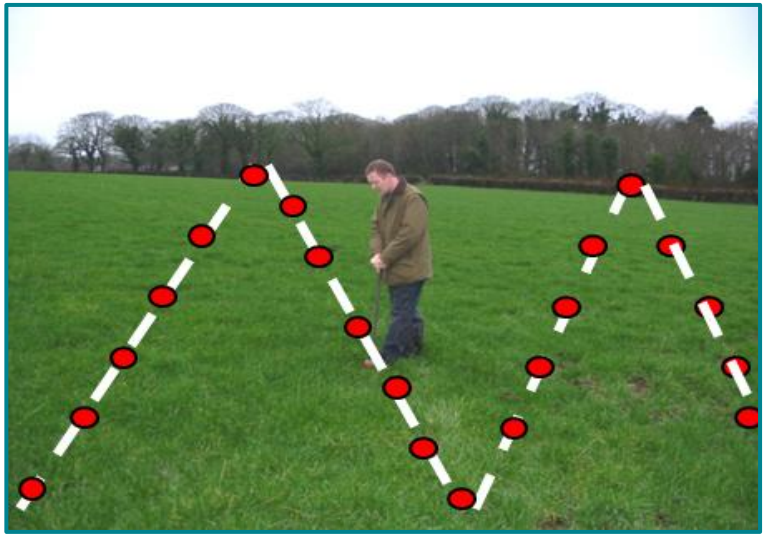
- Group cows according to condition score and feed accordingly

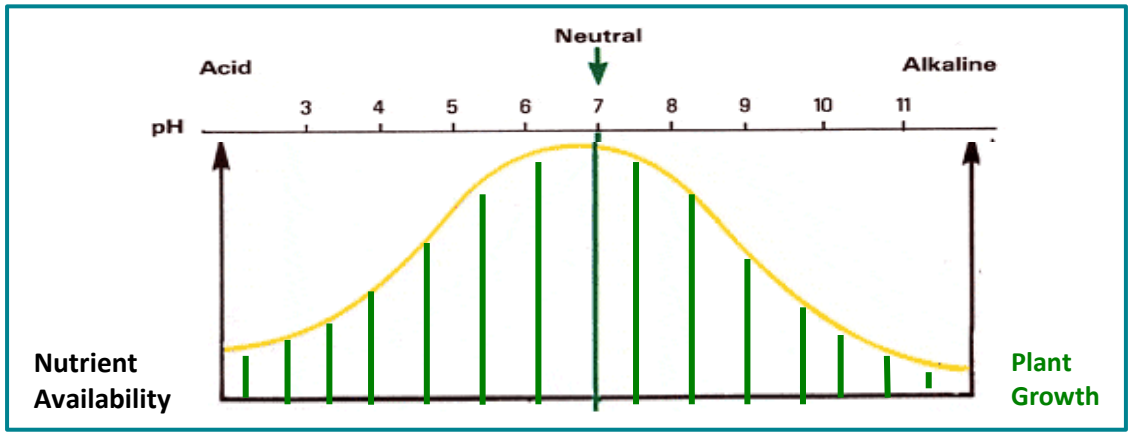
Thin cows	**OK cows**	Fat cows
<2.5	**2.5 – 3**	>3.0

- Dependent on:
  - feed quality (silage analysis)
  - feed space allowance
  - feed method
  - parasite control

- Options:
  - wean early
  - wean late
  - autumn grazing
  - forward creep grazing

Soil sampling, pH, nutrient availability and plant growth





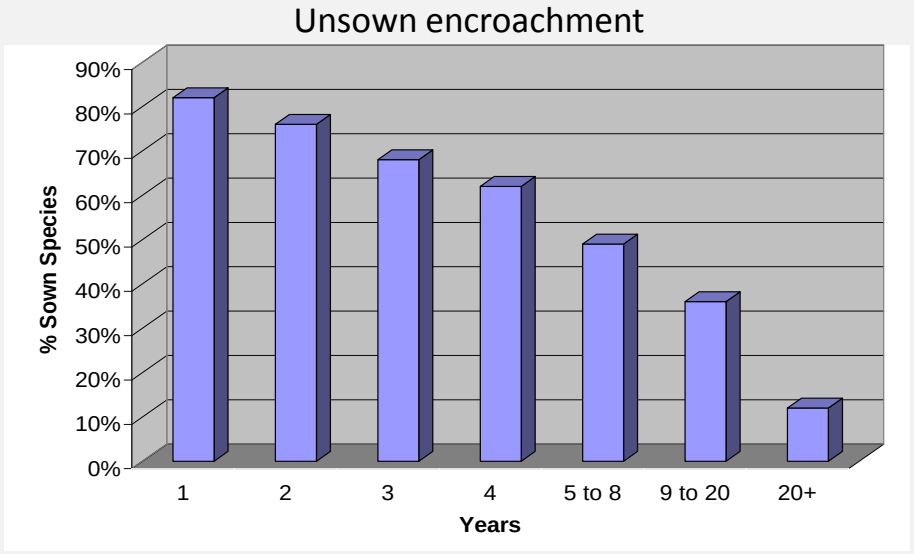
Soil analysis results

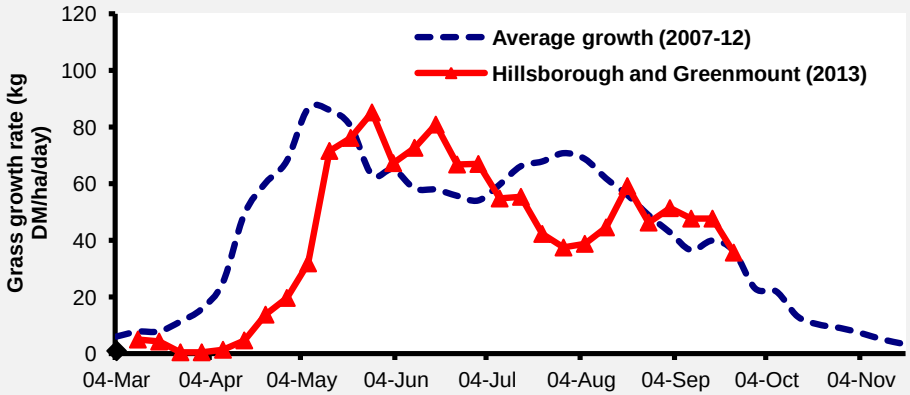
Field	pH	P	K
1	6.3	0	3
2	6.0	2	0
3	5.5	1	1
4	5.3	2	4

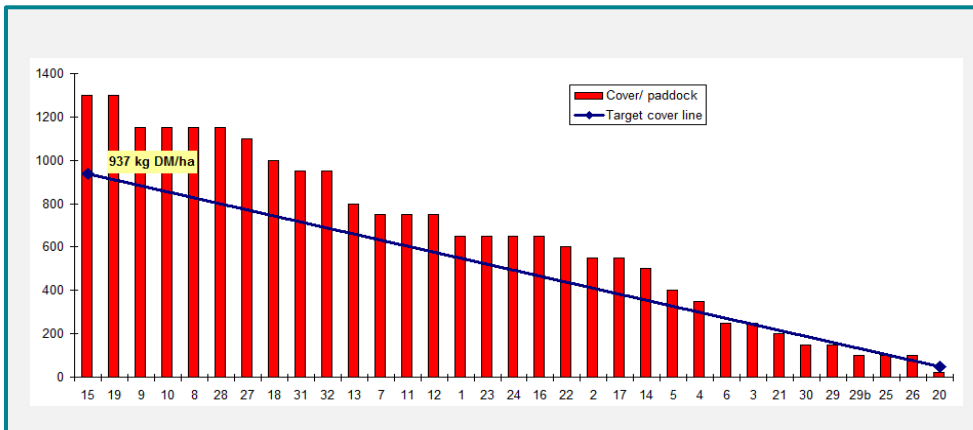
Dig a hole to check for compaction

Soil P Index		What the P Index means
0	Deficient	Production will be limited. Requires slurry/manure and/or P fertiliser.
1	Optimum Extensive	Extensive grazing. Continue with usual slurry & fertiliser policy.
2	Optimum Intensive	Intensive grazing & silage fields & arable. Continue with usual slurry & fertiliser policy.
3	High	No yield response to added P. Redistribute slurry to more suitable fields. Use a zero- P fertiliser.
4 +	Excessive	No yield response or requirement for P. Redistribute slurry to more suitable fields. Use a zero- P fertiliser.

Managing Grass







Clover Swards

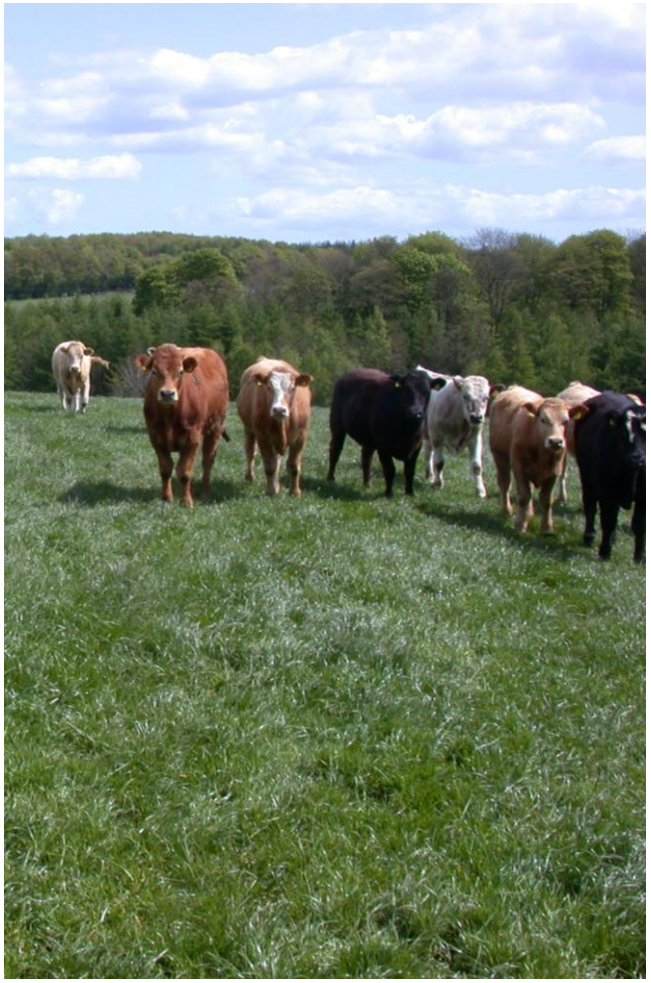
- 5-20% improvement in stock performance
- With no/little fertiliser can perform like a grass sward receiving 150-180kg N/ha/year
- Don't move stock onto a clover sward when it is wet or stock are very hungry to avoid bloat
- Sow white clovers with a range of leaf sizes
- Don't bury clover seed too deep
- Red clover swards are more suitable for cutting, don't cut too low (8cm+)
- Clover is more sensitive to acidity (pH) and fertility (P&K) than is grass
- Rest in July, graze hard in November
- Take care with spray selection

Newly established white clover

Red clover sward ready for cutting

Efficient Grassland Management

- Beef producers **must** get more production from grazed grass
  - Still plenty of scope on the majority of farms
- Matching grass supply with demand is the challenge!
  - 200kg+ over the grazing season is achievable
- Focus should be on grazing at the correct sward height
  - Rotational - 10 cm (4”) (approx. 2,800-3,000 kg DM/ha)
  - Set-stocking - 8 cm (3”) (approx. 2,200 kg DM//ha)
- Graze swards down tightly to 4 cm (1½”) or 1,500 kg DM/ha
  - Top swards if necessary – but keep it low!
- Short/leafy swards
  - Grow and recover more quickly
  - Have high energy and protein content
  - Encourages clover growth



Grazing Method

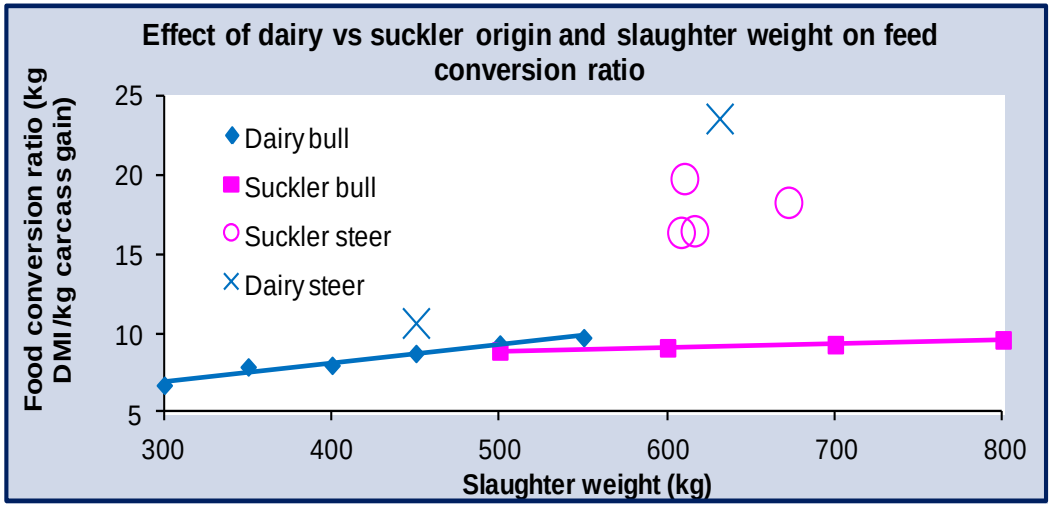
- 6 to 8 paddock rotational grazing system is best
- Paddock No can be increased at the ‘shoulders’ of the season
- Graze each paddock for 3/4 days
- Rest paddocks for 18-25 days
- Easier to determine a grass surplus/deficit and nitrogen requirement using a multi-paddock system
- Assess grass available by:
  - Plate Meter (kg DM/ha)
  - Eye balling
  - Calculate ‘Grazing Days Ahead’
- Paddocks allow more precision! **BUT** Good stockmanship is required
- Set-stocking in combination with topping is an option for some, particularly at lower stocking rates

Dairy origin beef production

Key questions:

- What stage do you purchase?
- How do you rear and finish them?
- Is dairy-origin beef production a worthwhile consideration?
- How do dairy-origin cattle compare with suckler origin cattle?

	Origin	
	Suckler	Dairy
Slaughter age (months)	25.2	26.2
Carcass weight (kg)	360	311
Conformation	R=	O=
Fat classification	3=	3-



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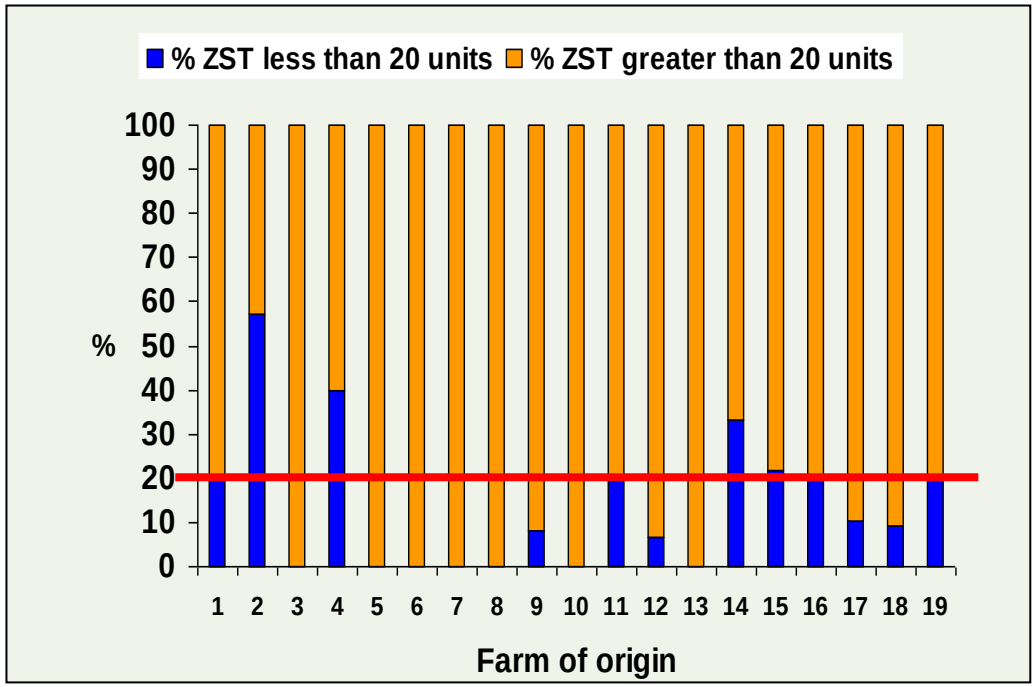
Sourcing dairy-origin calves

Importance of purchasing healthy calves



Parameter	*Immune status category (ZST units)*	
	0 - 20	*>20*
Live weight gain (kg/d)		
Start to 3 mths	0.64	0.77*
Slaughter age (mths)	20.1	19.5**

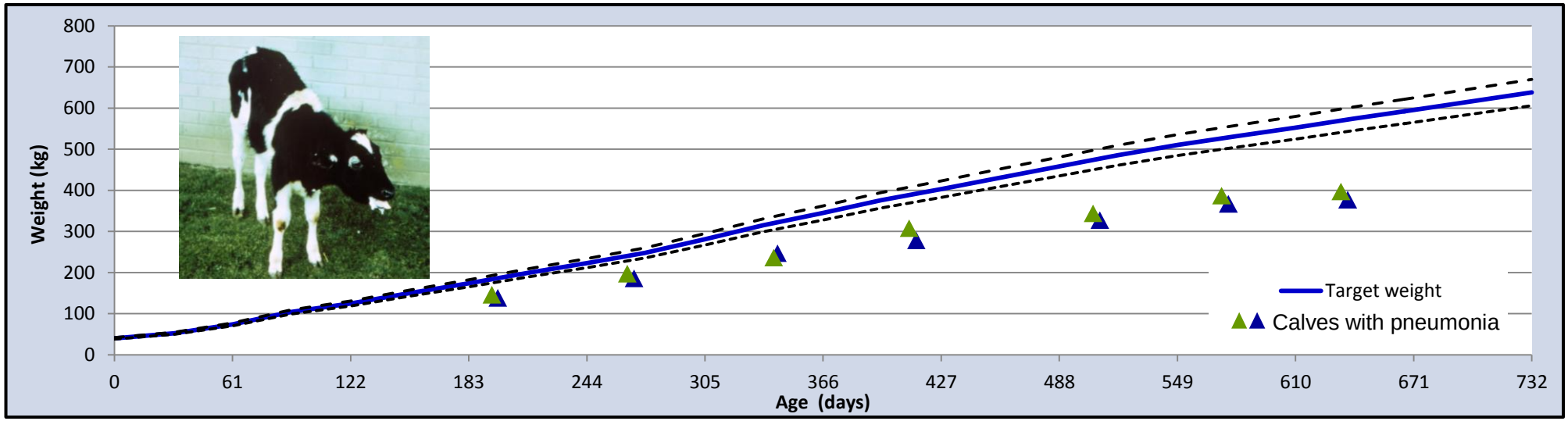
- 14% of calves per farm had inadequate immune status (ZST < 20 units)
- Significant variation between farms
- Calves with low immune status:
  - required higher veterinary treatments
  - required additional 17 days to reach target slaughter weight

Influence of calf health

Impact of calf ill health on long term performance

Parameter	Effect of scour	
	No	Yes
Live weight (kg)		
8 weeks	71	68***
1.5 year	439	427*
Mortality at 1 year (%)	4.8	7.9*

Parameter	Effect of pneumonia	
	No	Yes
Live weight (kg)		
8 weeks	72	68***
1.5 year	441	428**



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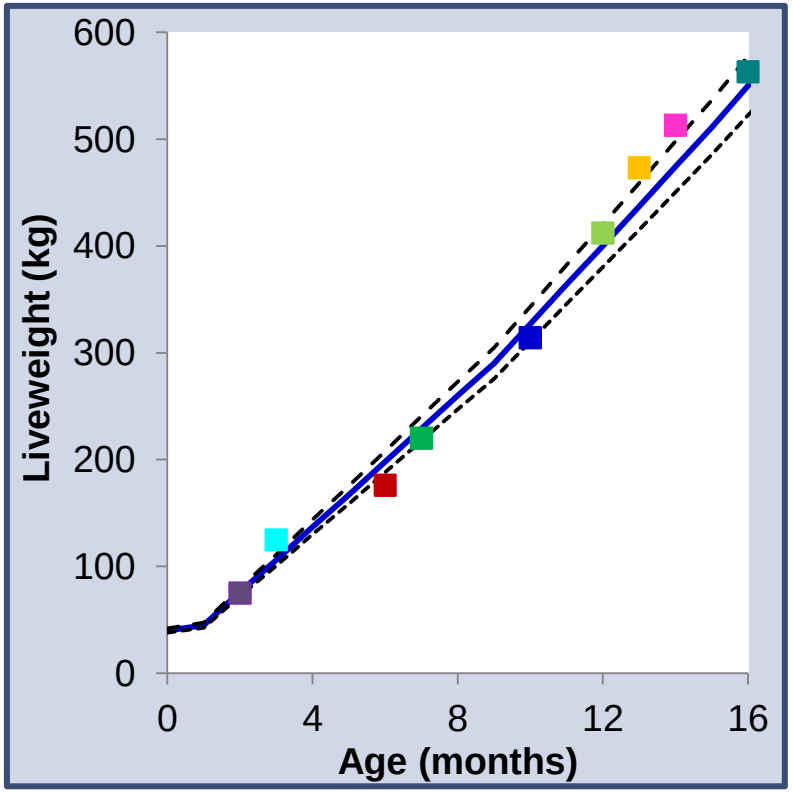
16 month old Holstein bull beef

Spring born Holstein bulls

- First summer at grass
- Finished on 50:50 forage : concentrate diet

SUMMARY	Quantity	£/head
Finished bull (P/O 2/3)	270 kg @ £2.90/kg	£783
Less calf value		£55
OUTPUT		**£728**
Calf rearing to 3 months		£97
Concentrate	1.6 tonne	£320
Grazing	0.05 ha	£34
Silage	1.1 tonne (DM)	£132
Vet/transport/fee		£40
Total variable costs		**£623**
GROSS MARGIN PER HEAD		**£105**



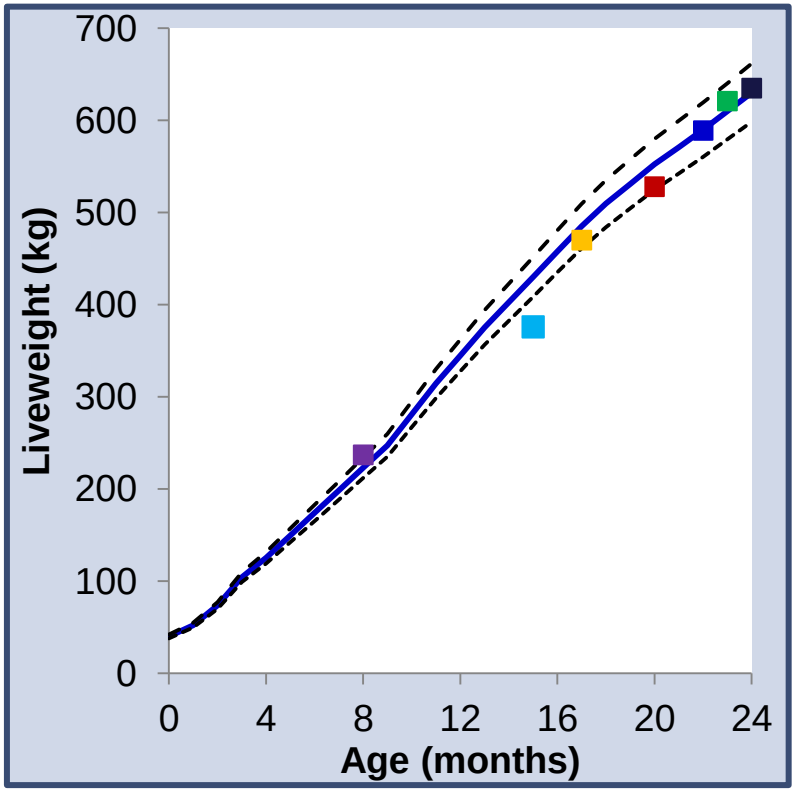
Target DLWG 1.05 kg/day

24 month old dairy-origin steer

Spring born Holstein and beef cross Holstein steers

- First and second summer at grass
- Finished on grass silage plus concentrates

SUMMARY	Quantity	£/head
Finished steer (P/O 3/4)	328 kg @ £2.98/kg	£977
Less calf value		£175
OUTPUT		**£802**
Calf rearing to 3 months		£97
Concentrate	0.8 tonne	£160
Grazing	0.3 ha	£204
Silage	1.9 tonne (DM)	£228
Vet/transport/fee		£50
Total variable costs		**£739**
GROSS MARGIN PER HEAD		**£63**



Target DLWG 0.8 kg/day

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16 month old Holstein bull beef

Autumn born Holstein bulls

- Should a grazing period be included in a 16 month bull system?
- Is it worthwhile supplementing these dairy origin bulls while at grass?

	2 kg concentrate	0 kg concentrate
LW at turnout (kg) (6 months)	174	174
LW at housing (kg) (10 months)	309	304
LWG(kg/d)	1.17	1.12

Experimental treatment

- Set stocked – no concentrate
- Set stocked – 2 kg concentrate

	2 kg concentrate	0 kg concentrate
Estimated increase in carcass weight (kg)	64.9	62.2
Increase in carcass value (£)	184	177
Grazing cost (£)	54	54
Concentrate cost (£)	48	0
Veterinary cost (£)	2	2
Margin over costs (£)	80	121

Key Messages

- No benefit of concentrate supplementation at grass
- Supplementing these cattle at grass reduced potential margins over costs by £40/head
- Potential to produce low cost beef from grass

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Key messages

- **Based on industry data there is potential to**
  - reduce calving age
  - reduce calving interval
  - increase animal performance (carcass gain)

  } Potential to reduce production cost and reduce GHG emissions

- **Relative to Limousin cross Holstein suckler cows the Stabiliser composite**
  - has similar maternal traits
  - higher BCS, which allows for potential saving in winter feeding costs
  - less milk and lower weaning weights of progeny
  - BUT similar live weights post weaning
  - allows for better biosecurity

- **Dairy origin beef**
  - buy healthy
  - bulls more efficient than steers
  - maximise production from forage

- **Key to achieving high returns is through MONITORING performance**
  - weighing cattle
  - body condition scoring cows
  - benchmark

  } Feed accordingly

- **DON'T underestimate the value and potential of grazed grass**