Research Challenge Beef Farm Walk

"On-farm research to underpin improvements in the carbon footprint of beef production"

at the farm of:

Robert, David and Martin Sloan

32 Lisnastrean Road, Lisburn

Thursday 26th April, 2012

AgriSearch NI
Farmer Funded Research

afbi Agri-Food and Biosciences Institute

cafre
College of Agriculture, Food & Rural Enterprise

Researching the way forward

Research to underpin improved production efficiency

Today's farm walk is aimed at providing you with tools and information to help you make improvements with your beef enterprise

Topics for discussion include:

1. Calf management and health
2. Dairy origin rearing and finishing systems
3. Monitoring performance
4. Grassland management
5. Finishing options

Farm overview

Robert, David and Martin Sloan, Lisburn

- Farm Area: 500 acres
- Vegetable enterprise
- 280 cow Holstein-Friesian dairy herd
- Male progeny transferred to beef enterprise

Aims:

- Maximising production efficiency
  - monitoring performance
  - use of high quality grass/ grass silage

Recent Farm Developments & Technology include:

- Regular weighing of cattle to monitor growth
- Modifying diets in line with animal performance

Representation:

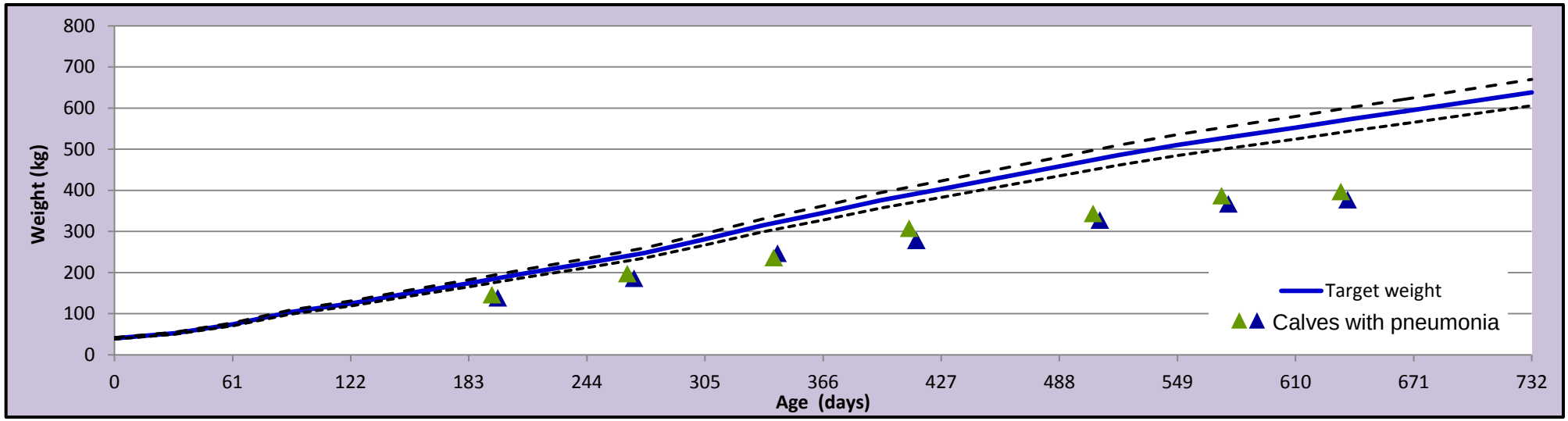
- Chairman of UFU Lagan Group

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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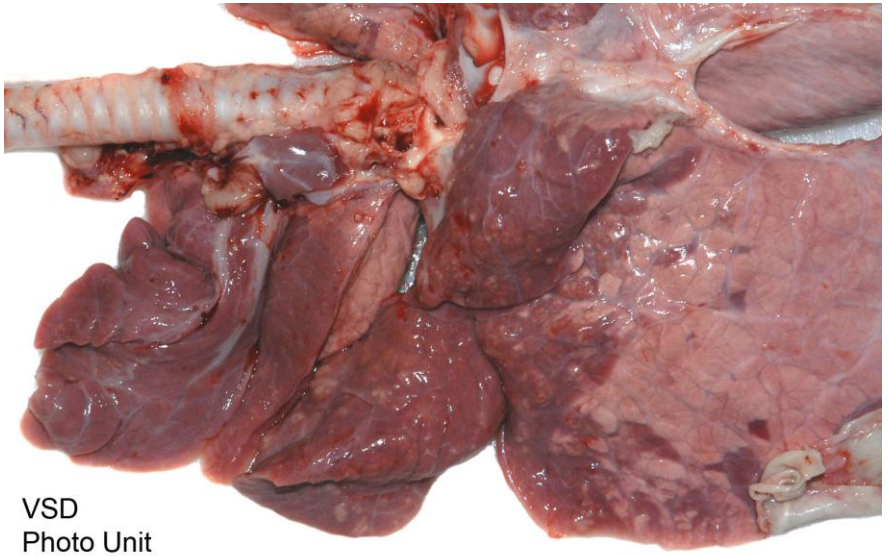
Vaccination plans

Pneumonia in older calves

ACUTE DISEASE (SHIPPING FEVER)

- INFECTIOUS AGENTS
  - Pasteurella
  - Mycoplasma spp
  - Viruses
    - PI3
    - RSV
    - BR
    - BVD
- ENVIRONMENT
  - Temperature change
- MANAGEMENT
  - Stress
    - Weaning
    - Mixing
    - Housing
    - Diet change
- PREVENTION
  - Management
  - Vaccination
  - Antibiosis



VSD
Photo Unit

Vaccination plans

Pneumonia in young calves

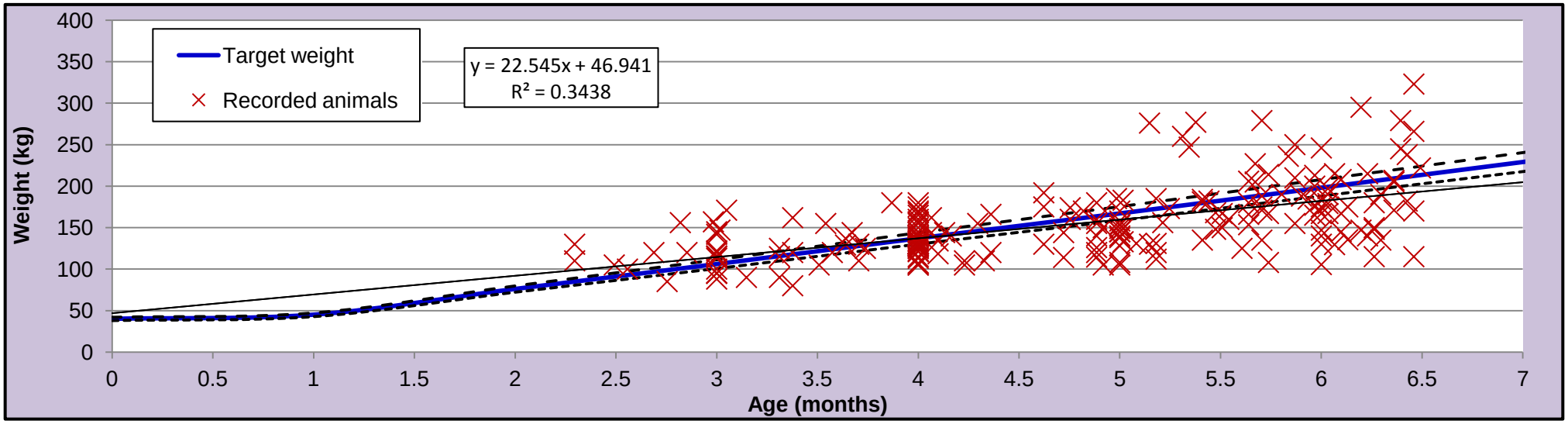
ACUTE and CHRONIC DISEASE

- INFECTIOUS AGENTS
  - Viruses
  - Mycoplasma spp
  - Bacteria
- ENVIRONMENT
  - Risk factors
    - Sudden cold stress, Heat stress, High humidity
- MANAGEMENT
  - Risk factors
    - Early weaning, Low colostrum, Multi-source, Mixing, Over-crowding, Poor hygiene, Procedures
- CALF FACTORS
  - Inherited traits
- PREVENTION
  - Management
  - Vaccination
  - Antibiosis

Achieving Target Weight

Performance of RCF producers

	Feeding period (days)	*Weight (kg)*	*Growth rate required (kg/d)*
Birth		45	
Birth to weaning	49	80	0.7
Weaning to turnout 1st summer	41	110	0.7



Key is to monitor performance – online tool being developed to help with this

First season grazing

Grassland management

Grazed Grass remains the cheapest source of feed available

Current Grass Quality (GrassCheck Figures)

Dry Matter	**21%**
ME	**12.4 MJ/kg DM**
Crude Protein	**20 %**

Grazing systems – Set Stocked or Rotational Grazing

Meal Feeding – No response in performance if well grazed

First season grazing

Grassland management

Stocking Rates:

Stock Carried/Ha	March	April - June	Jul – Aug	Sept - Oct
Suckler Cow plus Calf	2	3.5	3	2
400 Kg	2	5	3	2
320 Kg	3	6	4	2
250 Kg	4	8	5	3

Grazing Target:

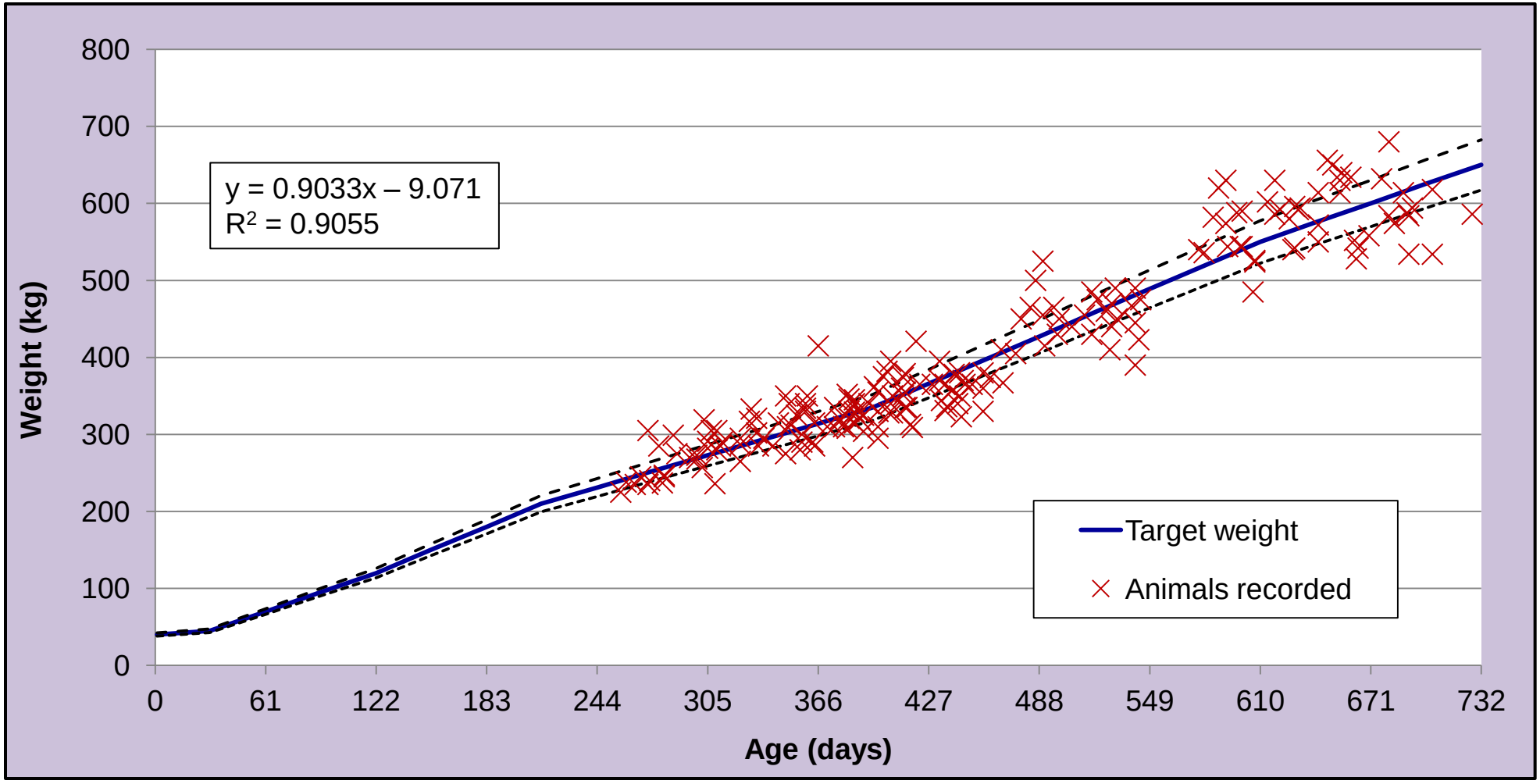
Pre Grazing grass cover **2800 kg DM/ha**
Post Grazing grass cover **1600 kg DM/ha**

Walk grazing swards regularly to monitor grass growth

Monitor performance and set realistic targets

Performance at grass

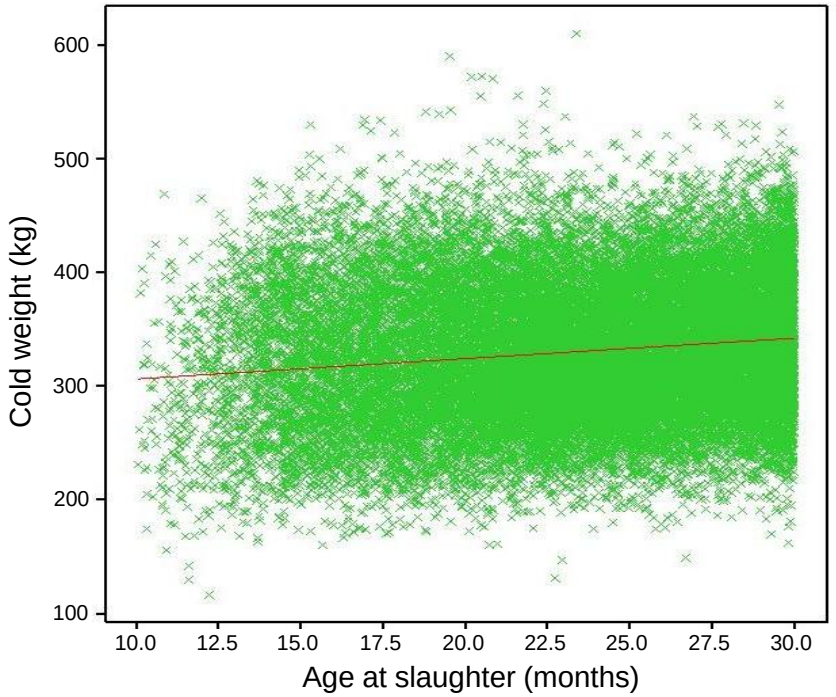
Sloan Farm



Bovine Information System

Industry Analysis

	Age at slaughter (months)	Carcass weight (kg)	Conformation grade	Fat class
Bulls	17.3	324	R	3
Steers	25.5	345	R	3
Heifers	24.6	307	R	3



- Large variation in weight of animals slaughtered in NI
- Poor relationship between age at slaughter and carcass weight
- Significant scope for improvement through targeted growth

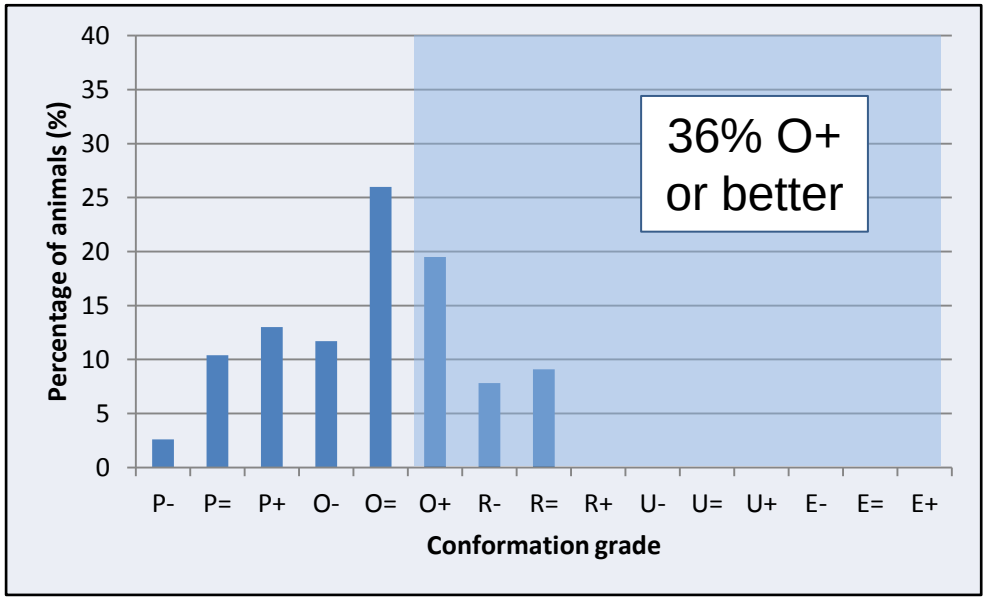
Steer Performance

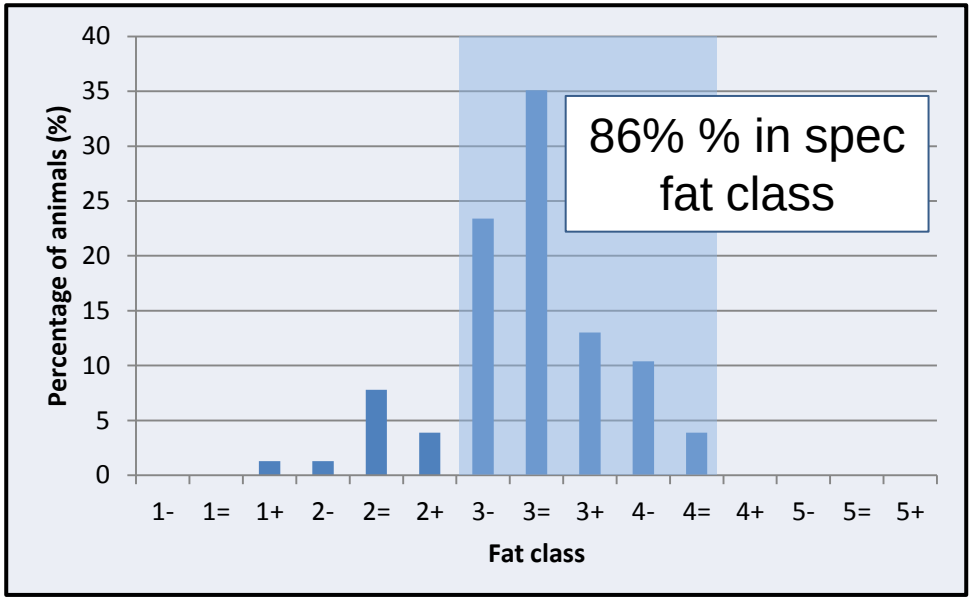
Robert, David and Martin Sloan

Breed category	No. of cattle	Age at slaughter (months)	Carcass weight (kg)	Conformation	Fat class
Pure Dairy	27	25.3	322	P+	3-
Native x Dairy	16	22.7	303	O=	3+
Continental x Dairy	34	24.5	350	O+	3=
AVERAGE		**24.4**	**328**	**O=**	**3=**

Steer Performance

Robert, David and Martin Sloan

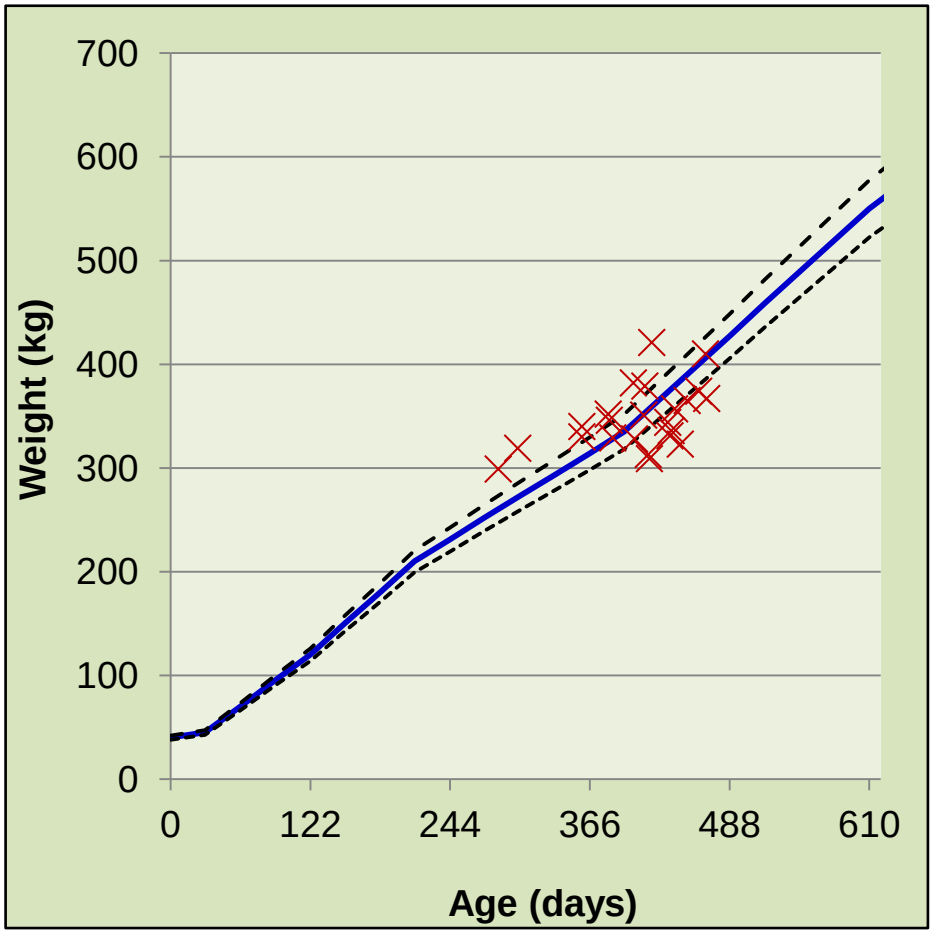




Steer Performance

Robert, David and Martin Sloan

SUMMARY	
Target age at slaughter (months)	20
Target weight at slaughter (kg)	550
No. of animals	23
Age (months)	14
Live weight (20 March) (kg)	348
DLWG required to present (kg/day)	0.75
DLWG achieved to present (kg/day)	0.75



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Gross margin analysis

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	(£/HEAD)
Finished steer (322 kg @ £3.06)	985
Less calf purchase price	90
OUTPUT	**895**
Rearing cost to 3 months	83
Concentrates (0.35 tonne)	70
Grassland cost (0.5 ha)	340
By-products (2 tonne)	41
Silage cost (3 tonne)	108
Vet /transport/fee	45
Total variable costs	687
GROSS MARGIN PER HEAD	**208**

24 Month Holstein Steer Beef Production

Aims:

- Calves reared on farm
- Achieved 0.78 kg/d DLWG from birth
- Slaughter age: 24 months
- Carcass weight: 320 kg
- Grade
  - Fat class 3
  - Conformation P
- Maximum use of grazed grass and high quality grass silage

Bull beef production systems

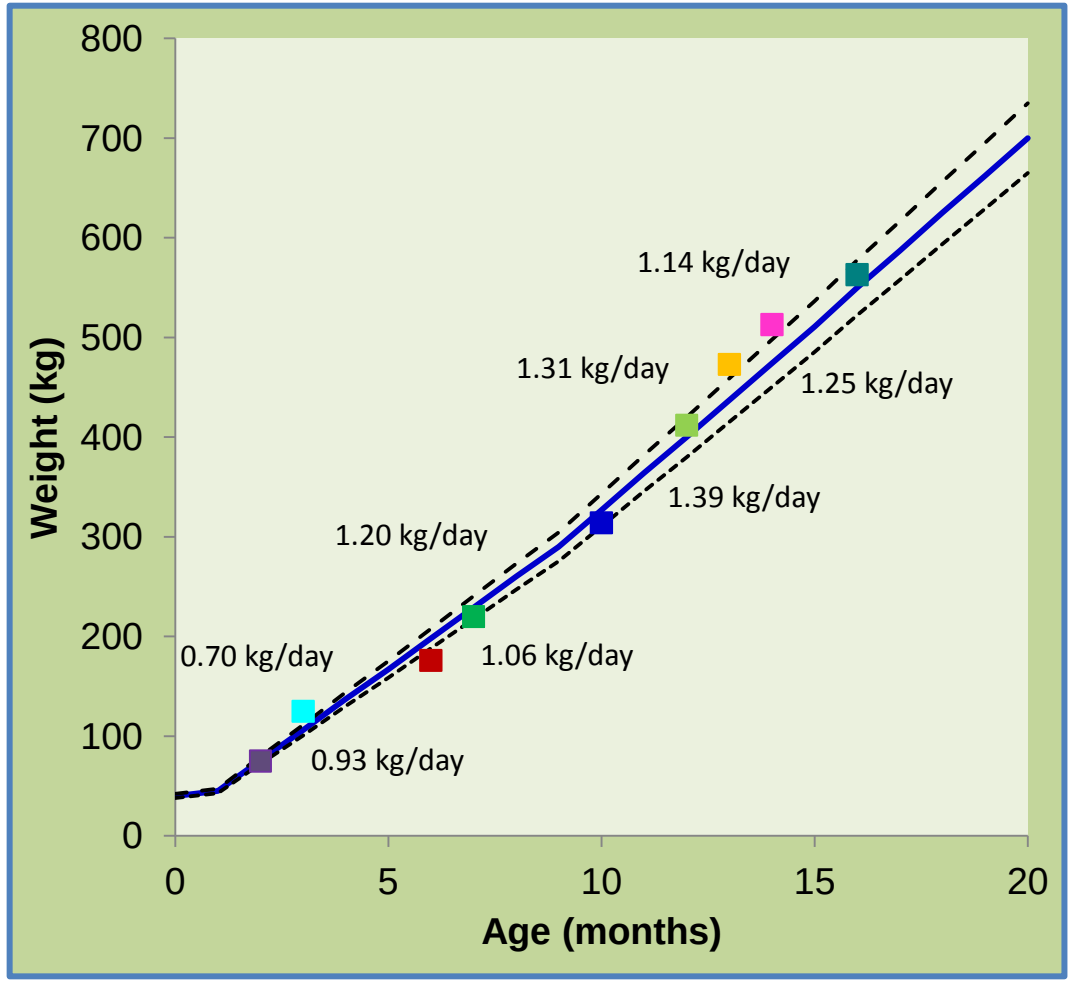
Finishing systems for Holstein and beef cross Holstein bulls

	Finishing system	
	Intensive bull system	Forage/concentrate based bull system
Slaughter age (months)	15.0	16.4
Lifetime carcass gain (kg/day)	0.67	0.58
Carcass weight (kg)	309	298
Total concentrate input (t fresh)	**2.6**	**1.7**
Total silage input (t DM)	0.27	0.86
Grazing area (ha/animal)	0	0.05
CARCASS VALUE (£)	**986**	**945**
TOTAL VARIABLE COSTS	**£743**	**£646**
GROSS MARGIN PER HEAD	**-£4**	**£52**

16 month old bull blueprint

Holstein Bulls

SUMMARY	
No. of animals	22
Target age at slaughter (months)	16
Target weight at slaughter (kg)	550
Carcass weight (kg)	270
Conformation	P/O
Fat class	2/3
Kill out %	49.6
DLWG required (kg/day)	1.05
DLWG achieved (kg/day)	1.12



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16 month old bull beef

Budget

SUMMARY	Quantity	£/head
Finished bull	270 kg @ £3.06/kg	826
Less calf value		123*
OUTPUT		**703**
Milk replacer	18 kg	27
Straw	70 kg	5
Concentrate	1.6 tonne	368
Grazing	0.05 ha	34
Silage	1.1 tonne (DM)	132
Vet/transport/fee		40
Total variable costs		**606**
GROSS MARGIN PER HEAD		**97**

Economics of production dependent on:

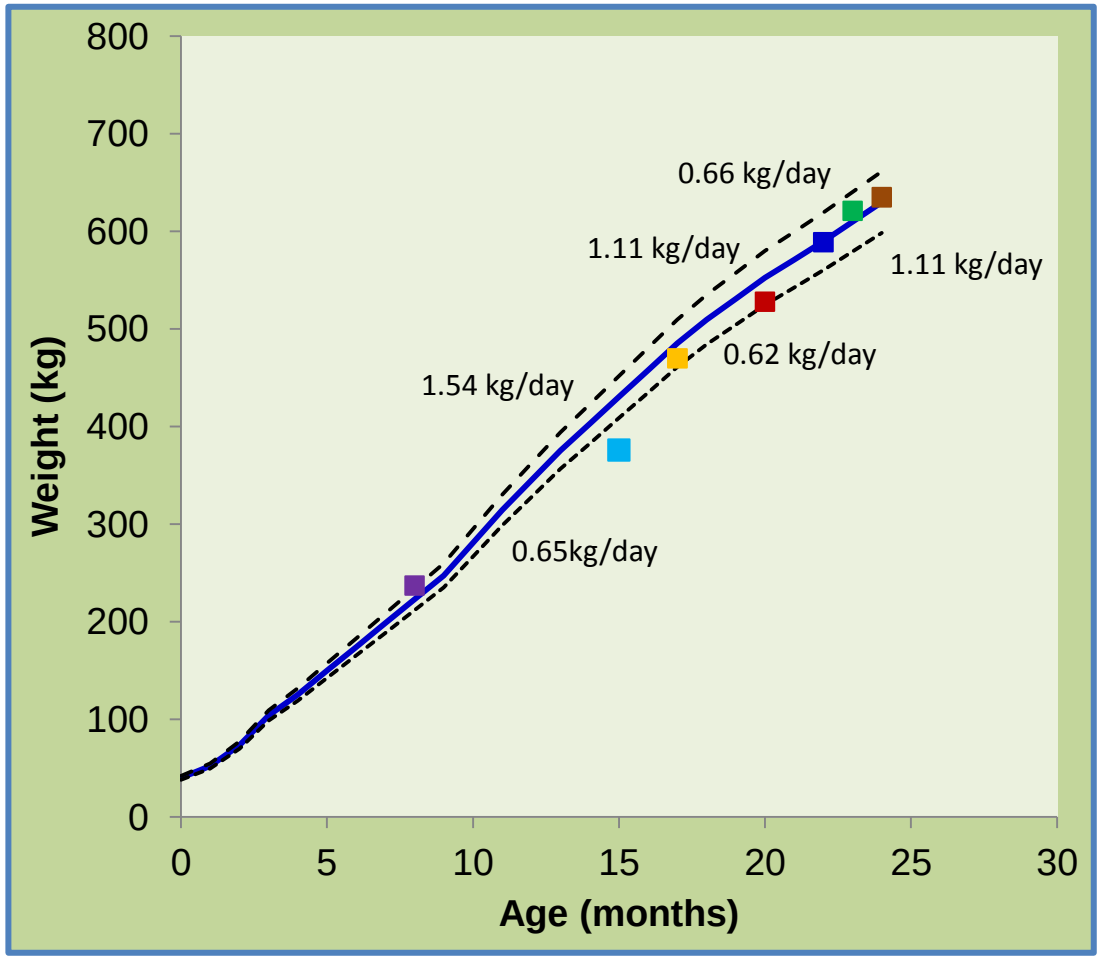
1) Purchase price
2) Calf mortality
3) Animal performance/health
4) Feed price
5) Beef price

Sensitivity analysis	
± £10/t conc price	± £16
± 10p/kg beef price	± £27

24 month steer blueprint

Holstein and Beef x Holstein Steers

SUMMARY	
No. of animals	42
Target age at slaughter (months)	24
Target weight at slaughter (kg)	630
Carcass weight (kg)	328
Conformation	P/O
Fat class	3 / 4
Kill out (%)	51
DLWG required (kg/day)	0.81
DLWG achieved (kg/day)	0.83



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26 month steer production

Comparison of Holstein and beef cross Holstein steers on medium concentrate system

	Holstein	Early maturing	Late maturing	
		(Angus)	Belgian Blue	Limousin
Lifetime carcass gain (kg/day)	0.39	0.41	0.41	0.43
Carcass weight (kg)	322	332	335	349
Kill out %	47.7	47.9	51.3	51.9
Concentrate inputs (t fresh)	1.2	1.1	1.1	1.1
Finished steer value	**£1001**	**£1046**	**£1072**	**£1117**
Less calf purchase price	£123	£264	£355	£355
OUTPUT	**£878**	**£782**	**£717**	**£762**
Production cost	£803	£752	£759	£767
GROSS MARGIN PER HEAD	**£75**	**£30***	**-£42**	**-£5**

24 month steer blueprint

Budget for rearing & finishing Holstein & Beef x Holstein steers

SUMMARY	Quantity	£/head
Finished steer	328 kg @ £3.11/kg	1020
Less calf value		247
OUTPUT		773
Calf rearing cost to 3 months		83
Concentrate	0.8 tonne	184
Grazing	0.3 ha	204
Silage	1.9 tonne (DM)	228
Vet/transport/fee		35
Total variable cost		734
GROSS MARGIN PER HEAD		39

Sensitivity analysis	
± £10/t concentrate price	± £9
± 10 p/kg carcass price	± £33

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Importance of silage quality

Silage quality	Poor	Average	Good
ME (MJ/kg DM)	9.8	10.8	11.5
Protein (% DM)	10.3	11.3	12.3
D-value (% DM)	61	67	72
HFIS Intake	70	79	85
Daily concentrate requirement to obtain:			
0.7 kg/day (300 kg steer)	2.5	1.0	0
1.0 kg/day (500 kg steer)	6.0	4.0	1.5

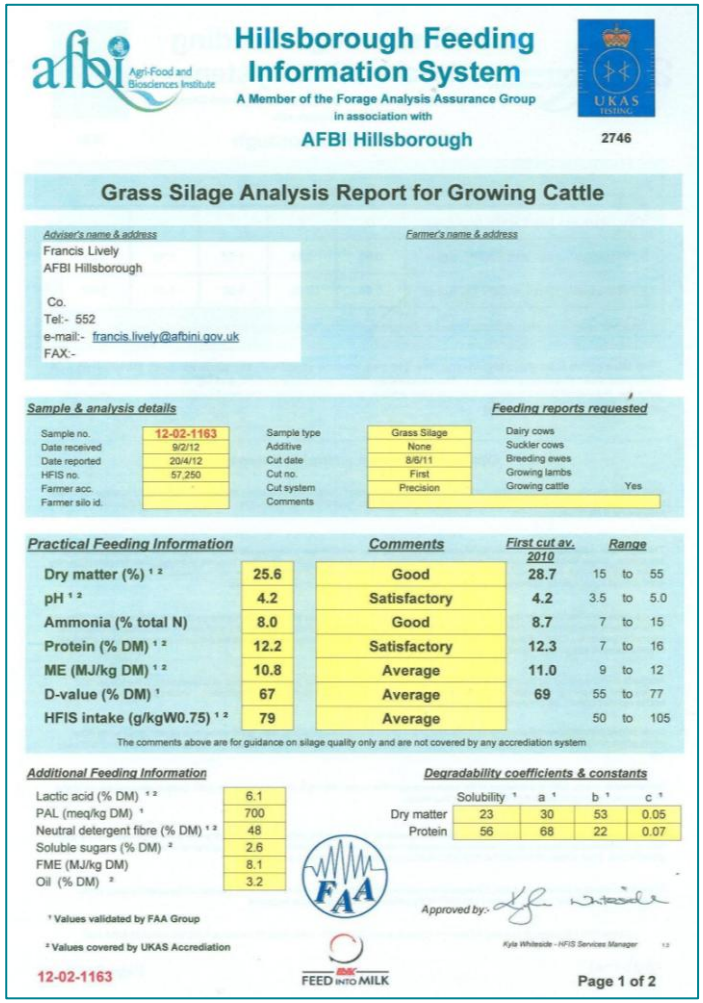
Message: **Producing high quality silage will lower concentrate requirement, lower feed cost and increase gross margin**

Silage quality on NI beef farms

Grass silage 2011 / 12	Average	Range
Dry Matter (%)	27.4	15 - 55
pH	4.2	3.5 – 5.0
Ammonia (% total N)	8.0	5 - 15
Protein (% DM)	11.3	7 - 18
ME (MJ/kg DM)	10.8	8.3 – 12.3
D-value (% DM)	67	52 - 77
HFIS Intake (g/kgW0.75)	79	50 - 105

This year the HFIS Service has analysed almost 10,000 grass silage samples, with 1,668 of these requesting a growing cattle or suckler report which relates to 17% of samples compared to 15% in the 2008/09 season

Hillsborough Feeding Information Service



Hillsborough Feeding Information System

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2746

Grass Silage Analysis Report for Growing Cattle

Adviser's name & address

Francis Lively
AFBI Hillsborough

Co.
Tel:- 552
e-mail:- francis.lively@afbini.gov.uk
FAX:-

Farmer's name & address

Sample & analysis details

Sample no.	12-02-1163	Sample type	Grass Silage
Date received	9/2/12	Additive	None
Date reported	20/4/12	Cut date	8/6/11
HFIS no.	57,250	Cut no.	First
Farmer acc.		Cut system	Precision
Farmer silo id.		Comments	

Feeding reports requested

Dairy cows	
Suckler cows	
Breeding ewes	
Growing lambs	
Growing cattle	Yes

Practical Feeding Information		Comments	First cut av. 2010	Range
Dry matter (%) [1 2]	25.6	Good	28.7	15 to 55
pH [1 2]	4.2	Satisfactory	4.2	3.5 to 5.0
Ammonia (% total N)	8.0	Good	8.7	7 to 15
Protein (% DM) [1 2]	12.2	Satisfactory	12.3	7 to 16
ME (MJ/kg DM) [1 2]	10.8	Average	11.0	9 to 12
D-value (% DM) [1]	67	Average	69	55 to 77
HFIS intake (g/kgW0.75) [1 2]	79	Average		50 to 105

The comments above are for guidance on silage quality only and are not covered by any accrediation system

Additional Feeding Information

Lactic acid (% DM) [1 2]	6.1
PAL (meq/kg DM) [1]	700
Neutral detergent fibre (% DM) [1 2]	48
Soluble sugars (% DM) [2]	2.6
FME (MJ/kg DM)	8.1
Oil (% DM) [2]	3.2

Degradability coefficients & constants

	Solubility [1]	a [1]	b [1]	c [1]
Dry matter	23	30	53	0.05
Protein	56	68	22	0.07

[1] Values validated by FAA Group

[2] Values covered by UKAS Accrediation

Approved by:- Kyla Whiteside - HFIS Services Manager

FEED INTO MILK

12-02-1163

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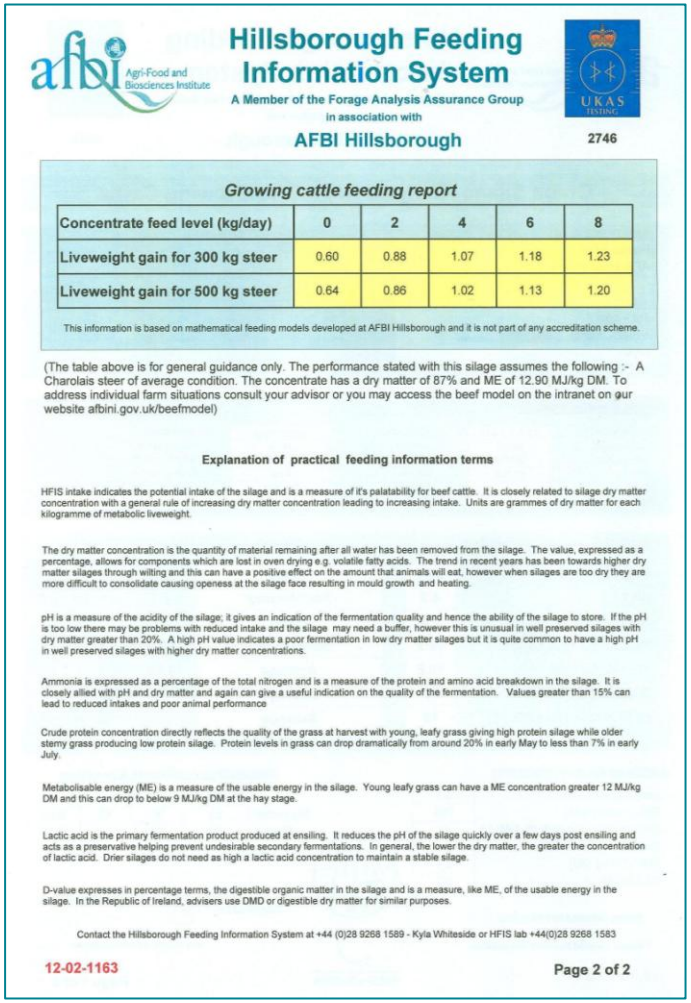

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Growing cattle feeding report

Concentrate feed level (kg/day)	0	2	4	6	8
Liveweight gain for 300 kg steer	0.60	0.88	1.07	1.18	1.23
Liveweight gain for 500 kg steer	0.64	0.86	1.02	1.13	1.20

This information is based on mathematical feeding models developed at AFBI Hillsborough and it is not part of any accreditation scheme.

(The table above is for general guidance only. The performance stated with this silage assumes the following :- A Charolais steer of average condition. The concentrate has a dry matter of 87% and ME of 12.90 MJ/kg DM. To address individual farm situations consult your advisor or you may access the beef model on the intranet on our website afbini.gov.uk/beefmodel)

Explanation of practical feeding information terms

HFIS intake indicates the potential intake of the silage and is a measure of it's palatability for beef cattle. It is closely related to silage dry matter concentration with a general rule of increasing dry matter concentration leading to increasing intake. Units are grammes of dry matter for each kilogramme of metabolic liveweight.

The dry matter concentration is the quantity of material remaining after all water has been removed from the silage. The value, expressed as a percentage, allows for components which are lost in oven drying e.g. volatile fatty acids. The trend in recent years has been towards higher dry matter silages through wilting and this can have a positive effect on the amount that animals will eat, however when silages are too dry they are more difficult to consolidate causing openess at the silage face resulting in mould growth and heating.

pH is a measure of the acidity of the silage; it gives an indication of the fermentation quality and hence the ability of the silage to store. If the pH is too low there may be problems with reduced intake and the silage may need a buffer, however this is unusual in well preserved silages with dry matter greater than 20%. A high pH value indicates a poor fermentation in low dry matter silages but it is quite common to have a high pH in well preserved silages with higher dry matter concentrations.

Ammonia is expressed as a percentage of the total nitrogen and is a measure of the protein and amino acid breakdown in the silage. It is closely allied with pH and dry matter and again can give a useful indication on the quality of the fermentation. Values greater than 15% can lead to reduced intakes and poor animal performance

Crude protein concentration directly reflects the quality of the grass at harvest with young, leafy grass giving high protein silage while older stemy grass producing low protein silage. Protein levels in grass can drop dramatically from around 20% in early May to less than 7% in early July.

Metabolisable energy (ME) is a measure of the usable energy in the silage. Young leafy grass can have a ME concentration greater 12 MJ/kg DM and this can drop to below 9 MJ/kg DM at the hay stage.

Lactic acid is the primary fermentation product produced at ensiling. It reduces the pH of the silage quickly over a few days post ensiling and acts as a preservative helping prevent undesirable secondary fermentations. In general, the lower the dry matter, the greater the concentration of lactic acid. Drier silages do not need as high a lactic acid concentration to maintain a stable silage.

D-value expresses in percentage terms, the digestible organic matter in the silage and is a measure, like ME, of the usable energy in the silage. In the Republic of Ireland, advisers use DMD or digestible dry matter for similar purposes.

Contact the Hillsborough Feeding Information System at +44 (0)28 9268 1589 - Kyla Whiteside or HFIS lab +44(0)28 9268 1583

12-02-1163

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Online growth monitoring

- AFBI developing a simple tool to aid growth monitoring
- Animal list and ages supplied by APHIS
- Inputted weights automatically plotted against target

Animal Weights

Animal Type: Dairy Origin Beef - Bulls

Target Age at Slaughter: 16 months

Target Slaughter Weight: 550 kg

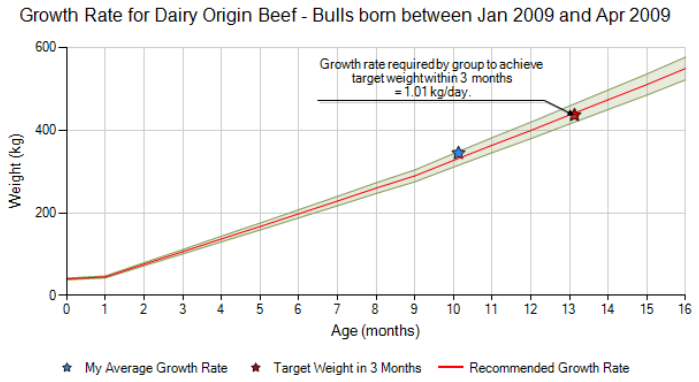
Animal Tag No	Sex	Breed	Date of Birth	Age (months)	Weight (kg)
UK 9XXXXXX 2130 5	M	Hereford	24/10/2010	10.2	
UK 9XXXXXX 2131 6	M	Hereford	24/10/2010	10.2	
UK 9XXXXXX 2132 7	M	Hereford	24/10/2010	10.2	
UK 9XXXXXX 2134 2	M	Hereford	26/10/2010	10.2	
UK 9XXXXXX 2135 3	M	Hereford	29/10/2010	10.1	
UK 9XXXXXX 2137 5	M	Friesian	30/10/2010	10.0	
UK 9XXXXXX 2138 6	M	Hereford	31/10/2010	10.0	

« Previous Step | Get Growth Target Report »

New Report | Print Report | Download Report

Animal Summary Table | Summary Chart | Individual Animal Chart

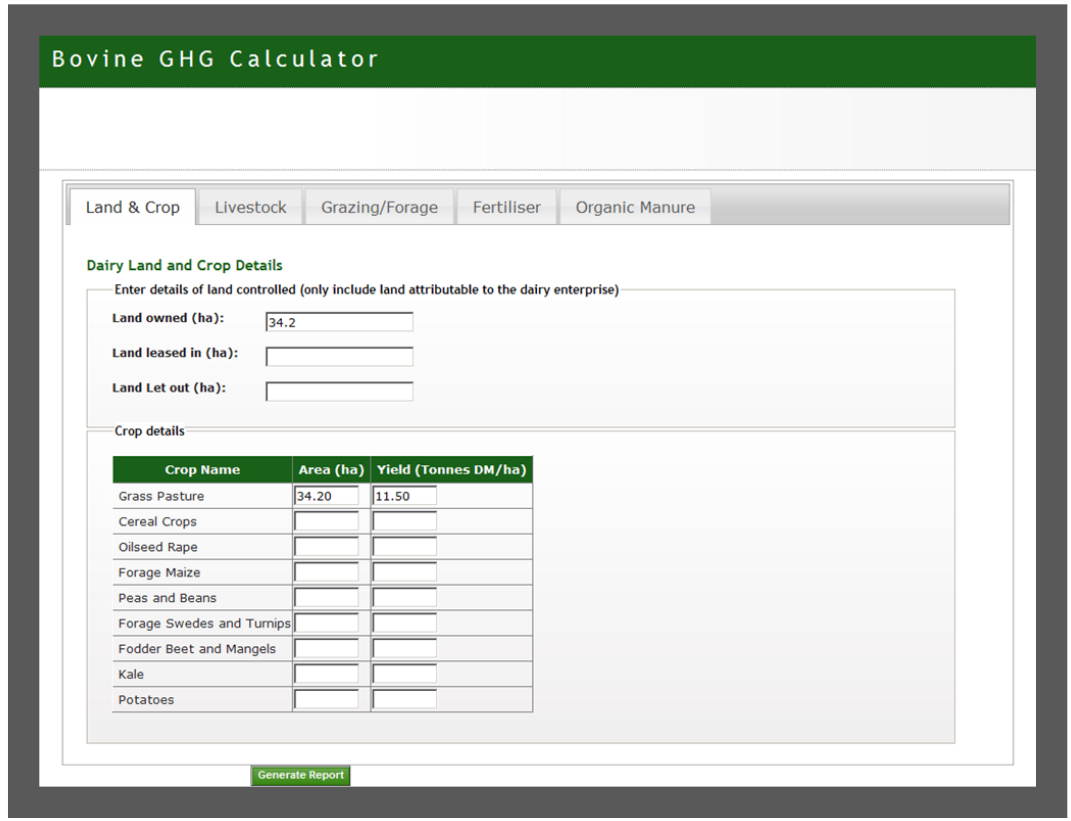
Average Growth Rate Data



Online monitoring of Greenhouse gases

BovIS
Bovine Information System

- Online GHG monitoring tool
- Linked with animal counts from APHIS
- Provides baseline values
  - enabling benchmarking
- Exploration of mitigation strategies
- Launch date summer 2012



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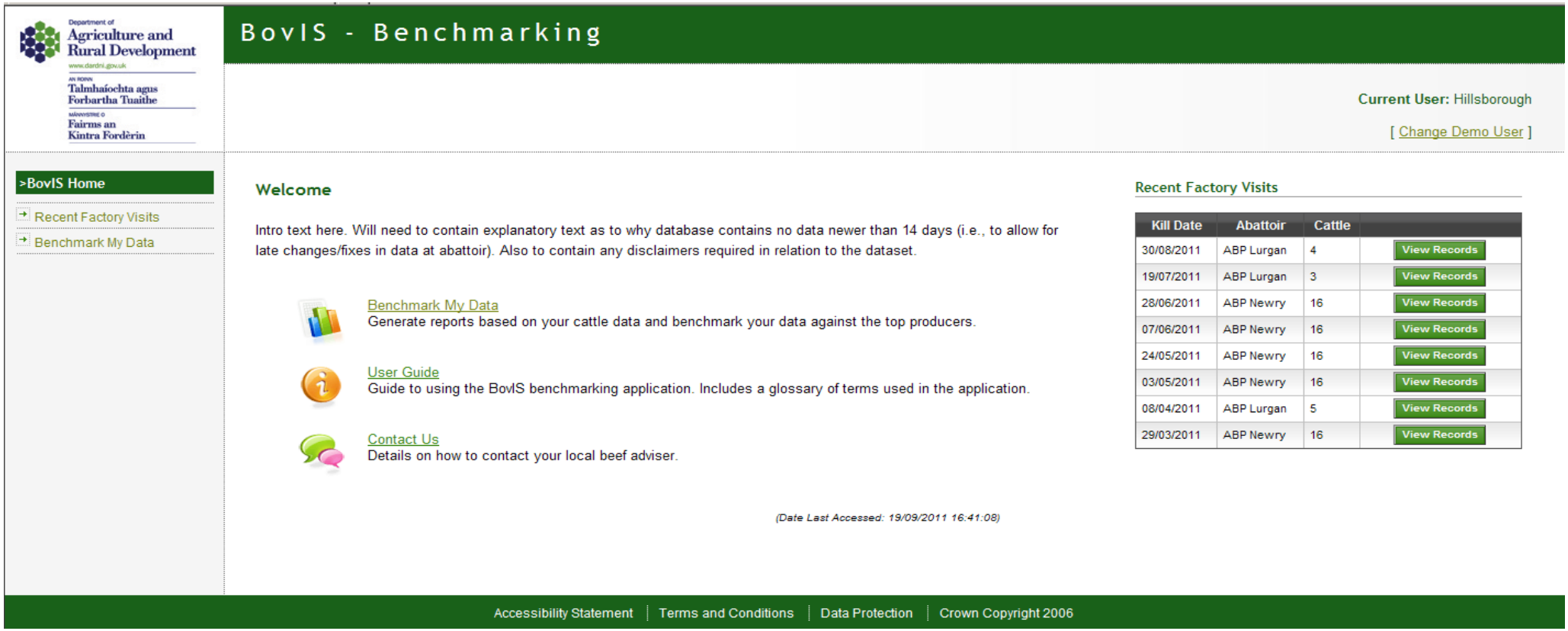
Bovine Information System (BovIS) – Carcass Benchmarking Tool



BovIS - Recent factory visit information

BovIS - Benchmarking

Current User: Hillsborough

[Change Demo User]

Recent Factory Visits

« Return to Slaughter History

Details of Cattle Slaughtered: 28 June 2011

Animal Tag	Date of Birth	Type	Breed	Age at Slaughter (months)	Carcass Weight (kg)	Grade	Fat Class	Daily Carcass gain (kg/day)	
UK 9 390002 8251 2	04/02/2010	Young Bull	Stabiliser	16.7	418.30	U-	4-	0.82	View Dam View Sire
UK 9 390002 8256 7	07/02/2010	Young Bull	Stabiliser	16.6	384.40	U-	4-	0.76	View Dam View Sire
UK 9 390002 8265 2	01/04/2010	Young Bull	Stabiliser	14.9	346.20	U=	3=	0.76	View Dam View Sire
UK 9 390002 7825 3	18/03/2010	Young Bull	Stabiliser	15.3	335.40	U-	4-	0.72	View Dam View Sire
UK 9 390002 7983 7	26/11/2009	Steer	Holstein	19.0	306.20	P+	3+	0.53	View Dam View Sire
UK 9 390002 7986 3	02/12/2009	Steer	Holstein	18.8	296.20	P-	3=	0.52	View Dam View Sire
UK 9 390002 7974 5	17/11/2009	Steer	Holstein	19.3	293.00	P+	3=	0.50	View Dam View Sire
UK 9 390002 7987 4	13/12/2009	Steer	Holstein	18.4	284.00	P+	3+	0.51	View Dam View Sire
UK 9 390002 8166 1	20/01/2010	Young Bull	Holstein	17.2	273.40	P+	3-	0.52	View Dam View Sire
UK 9 332751 2450 5	05/02/2010	Young Bull	Holstein	16.7	270.40	P+	3-	0.53	View Dam View Sire
UK 9 390002 7993 3	31/12/2009	Steer	Holstein	17.8	270.10	O-	3=	0.50	View Dam View Sire
UK 9 332751 2435 4	21/01/2010	Young Bull	Holstein	17.2	254.40	P+	2=	0.49	View Dam View Sire
UK 9 390002 7984 1	28/11/2009	Steer	Holstein	18.9	254.40	O=	3-	0.44	View Dam View Sire
UK 9 390002 7956 1	25/10/2009	Steer	Holstein	20.0	254.00	P+	2+	0.42	View Dam View Sire
UK 9 390002 7982 6	25/11/2009	Steer	Holstein	19.0	249.70	P+	3=	0.43	View Dam View Sire
UK 9 390002 7969 7	09/11/2009	Steer	Holstein	19.5	249.30	P=	3=	0.42	View Dam View Sire

BovIS - Benchmarking against another time period within your herd

BovIS - Benchmarking

Current User: Hillsborough

[Change Demo User]

Benchmarking Report

Select Breed/Breed Category: Pure Dairy (23) | View Report | Compare Breed | Compare Date Range

Summary | Conformation | Fatness | Weight | Carcass Gain | Animal Data

Summary Data

Report Date Range: 01/08/2010 to 31/08/2011

Animal Type: Young Bulls
Breed Category: Pure Dairy
Breed: All "Pure Dairy" Breeds

Animal Count: 23
Carcass Gain Rank: 324 out of 853

Summary of Your Performance

	Animal Count	Avg Weight (kg)	Avg Fatness	Avg Conformation	Avg Age (mths)	Avg Carcass Gain (kg/day)	In Spec (%)
My Young Bulls	23	279.2	3-	O-	16.1	0.57	0.0
Top 10%	591	297.4	3-	O=	13.7	0.73	10.2
All Producers	10,802	272.4	2+	O=	16.7	0.55	2.0
My Pure Continental	7	363.1	4-	U-	15.6	0.76	71.4
Aug 2009 - Aug 2010	20	283.3	3=	O-	16.0	0.58	0.5

NOTES