

Research Challenge Beef Farm Walk

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

at the farm of:

Brian Radcliffe

10 Tullyconnaght Road, Banbridge



Wednesday 26th October 2011

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
2. Dairy origin rearing and finishing systems
3. Monitoring performance
4. BovIS applications

Brian Radcliffe, Tullyconnaght Road, Banbridge

- Farm Area: 62 acres owned and 13 acres leased
- 200 Dairy born beef cattle
- Pedigree Charolais and Bluefaced Leicester Sheep
- Part-time



Aims:

- Source calves from reputable producers
- Maximising production efficiency
- Finish bulls under 16 months

Impact of colostrum on calf performance

	Immune status category (ZST units)	
	0-20	>20
Percentage of calves receiving antibiotic pre-weaning (%)	48	37
<i>Live weight gain (kg/day)</i>		
Start to 3 months	0.64	0.77
Age at slaughter	20.1	19.5
Margin/feed (£/head)	121	138

14% of calves per farm had inadequate immune status (ZST <20) which lead to more health problems and lower performance colostrum is critical!

Impact of calf ill health on long term performance

Parameter	Effect of scour	
	No	Yes
Live weight (kg)		
8 weeks	71	68***
6 months	161	152**
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 year	272	263**
1.5 year	441	428**

- ◆ Calf ill health has a long term impact on animal performance

Reduced labour feeding systems

	Low Labour	Standard
<i>Live weight gain (kg/day)</i>		
Start to weaning	0.67	0.67
Carcass weight (kg)	334	334
Labour input (mins/calf/day)	2.1	5.2
Labour input (hours/week/50 calves)	12	30
Labour costs (£)	890	2163

* assume labour cost of £12/hour (DARD Farm Business Data, 2009), 6-week rearing period, rearing 50 calves



- ◆ Systems are available to minimise labour costs that have no detrimental effect on animal performance

Feeding options

	AFBI Hillsborough*	
	Once	Twice
Milk replacer intake (kg DM)	14.4	18.6
Starter intake (kg DM)	69.7	68.8
Liveweight gain (kg/day)	0.4	0.4
Relative labour requirement ¹	67	100

Calves weaned at 35 and 42 days for the once and twice-a-day treatments respectively – intake and performance data recorded until day 70

Message: Once-a-day feeding can be performed successfully under good management and will reduce labour requirements

Target weight for 24 month steer production

	Feeding period (days)	Weight (kg)	Growth rate required (kg/d)
Birth		45	
Birth to weaning	49	80	0.7
Weaning to turnout 1 st summer	41	110	0.7
Turnout to housing 1 st winter	153	235	0.8
Housing to turnout 2 nd summer	182	380	0.8
Turnout to housing 2 nd winter	183	530	0.8
Housing 2 nd winter to slaughter at 24 months	123	630	0.8

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

Target weight for 18 month steer production

	Feeding period (days)	Weight (kg)	Growth rate required (kg/d)
Birth		45	
Birth to weaning	49	80	0.7
Weaning to turnout 1 st summer	163	240	0.9 -1.0
Turnout to housing 1 st winter	183	405	0.9
Housing to slaughter at 18 months	151	550	1.0

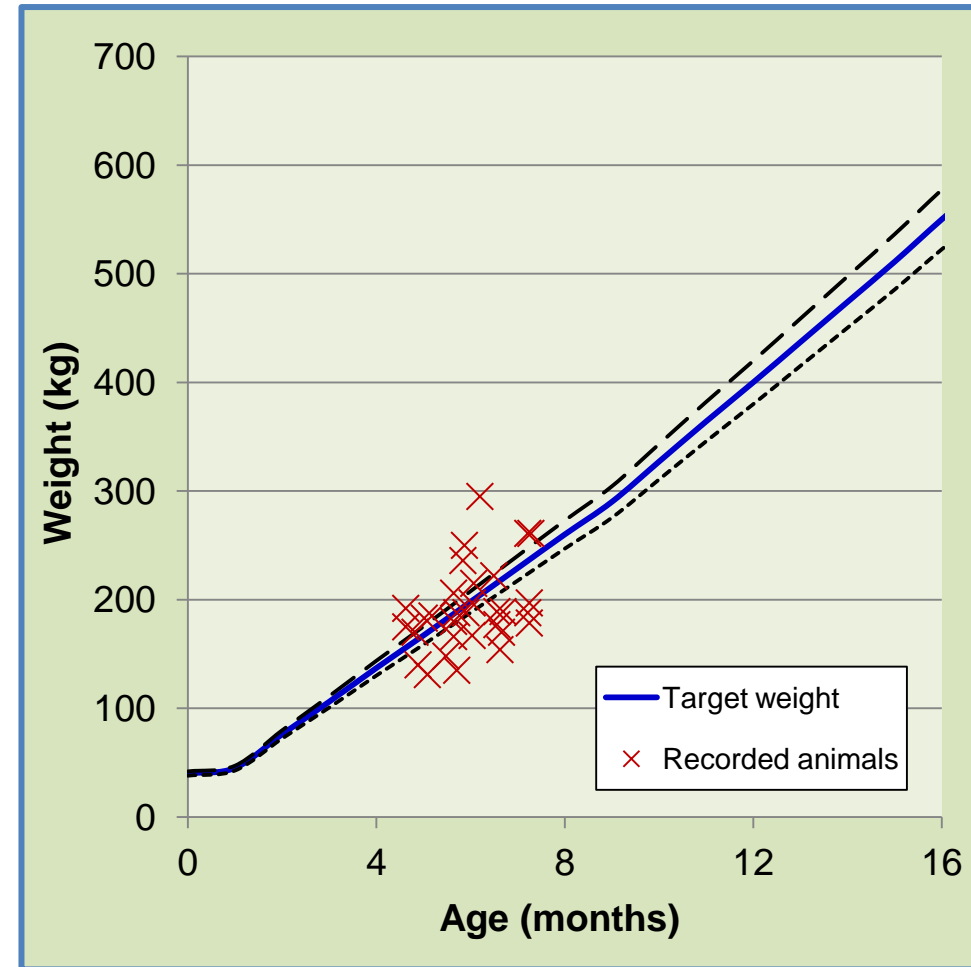
Key is to monitor performance – online tool being developed to help with this

Target weight for 16 month bull production

	Feeding period (days)	Weight (kg)	Growth rate required (kg/d)
Birth		45	
Birth to weaning	49	80	0.7
Weaning to turnout 1 st summer	41	110	0.7
Turnout to housing 1 st winter	153	250	0.9
Housing to slaughter at 16 months	245	550	1.2

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

SUMMARY	Group 1
Target age at slaughter (months)	16
Target weight at slaughter (kg)	550
No. of animals	31
Age (months)	6
Live weight (01 Sept) (kg)	191
DLWG required to present (kg/d)	0.86
DLWG achieved to present (kg/d)	0.80
DLWG since last visit (kg/d)	0.98
DLWG to slaughter at 16 months (kg/d)	1.18



	£/head
Finished bull (228 kg @ 284p/kg)	£648
Less calf value	£65*
OUTPUT	£583
Calf rearing cost to 3 months	£62
Concentrate (1.4 tonne)	£305
Grazing (SR 0.05/ha)	£35
Silage (0.7 tonne)	£84
Vet/transport/fee	£40
Total variable cost	£526
GROSS MARGIN PER HEAD	£57

* 6% calf mortality

Sensitivity analysis	
± £10/t concentrate price	£15
± 10 p/kg carcass price	£23

Rearing/finishing protocol

- calves are batched according to size
- offered grass silage + 2 kg conc until turnout
- turned out to pasture + 2 kg conc
- housed & gradually increased to ad lib concentrates with access to grass silage
- slaughtered under 15 months

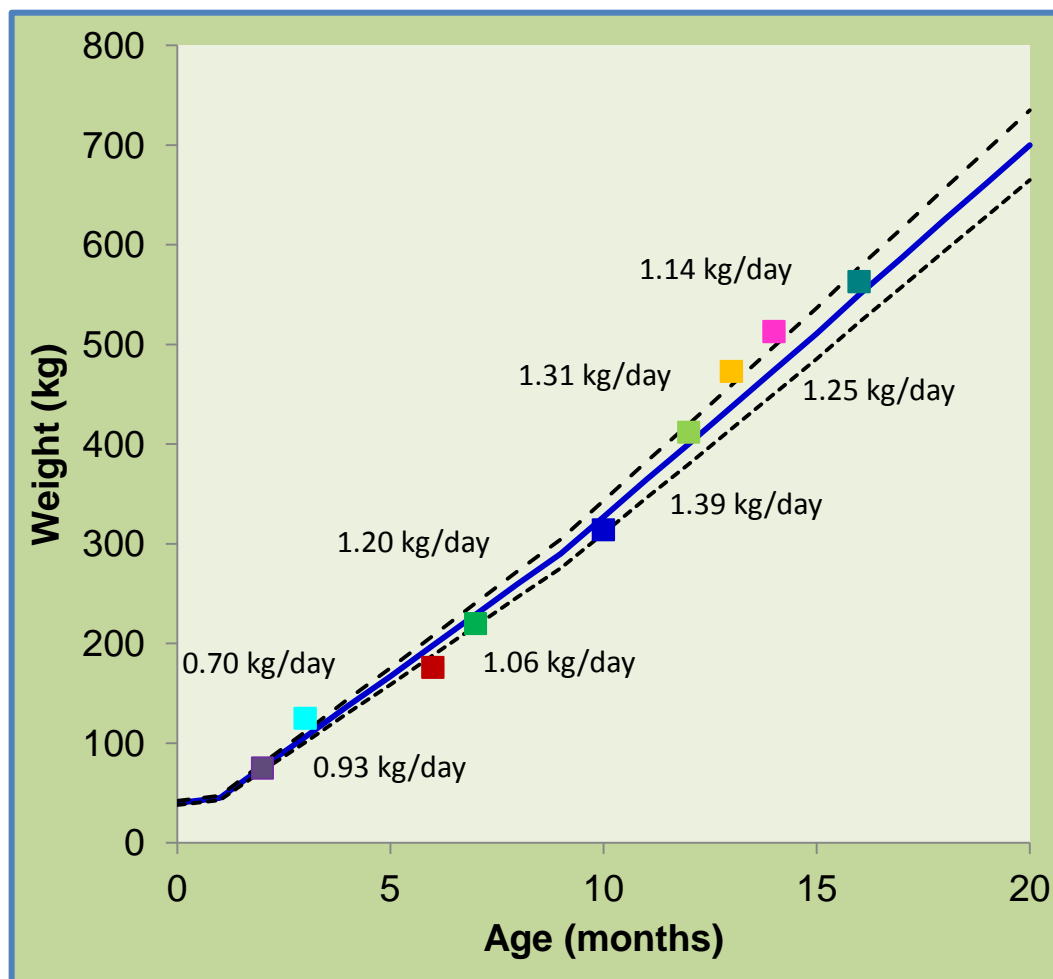
Aim

- Increase carcass weight at slaughter to 270kg

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



SUMMARY	Quantity	£/head
Finished bull	270 kg @ £2.84/kg	£767
Less calf value		£82*
OUTPUT		£685
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		£79

Economics of production very dependent on:

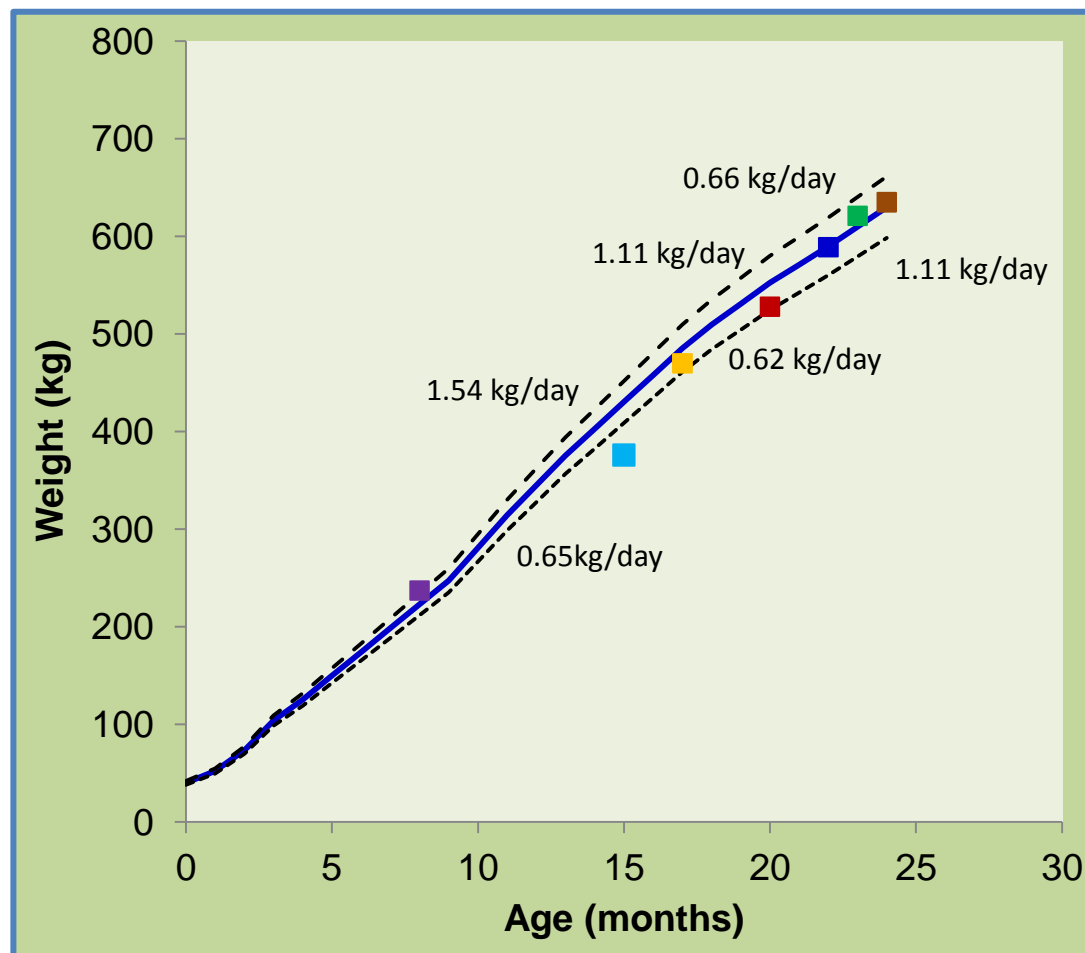
- 1) Purchase price
- 2) Calf mortality
- 3) Animal performance/health
- 4) Feed price
- 5) Beef price

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

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



Budget for rearing & finishing Holstein & Beef x Holstein steers

SUMMARY	Quantity	£/head
Finished steer	328 kg @ £2.84/kg	932
Less calf value		187
OUTPUT		745
Calf rearing cost to 3 months		70
Concentrate	0.8 tonne	184
Grazing	0.3 ha	204
Silage	1.9 tonne (DM)	228
Vet/transport/fee		35
Total variable cost		721
GROSS MARGIN PER HEAD		£24



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

- ◆ 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 »

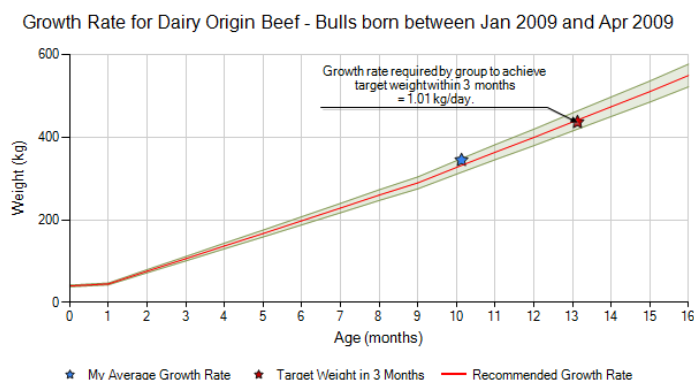
New Report Print Report Download Report

Animal Summary Table

Summary Chart

Individual Animal Chart

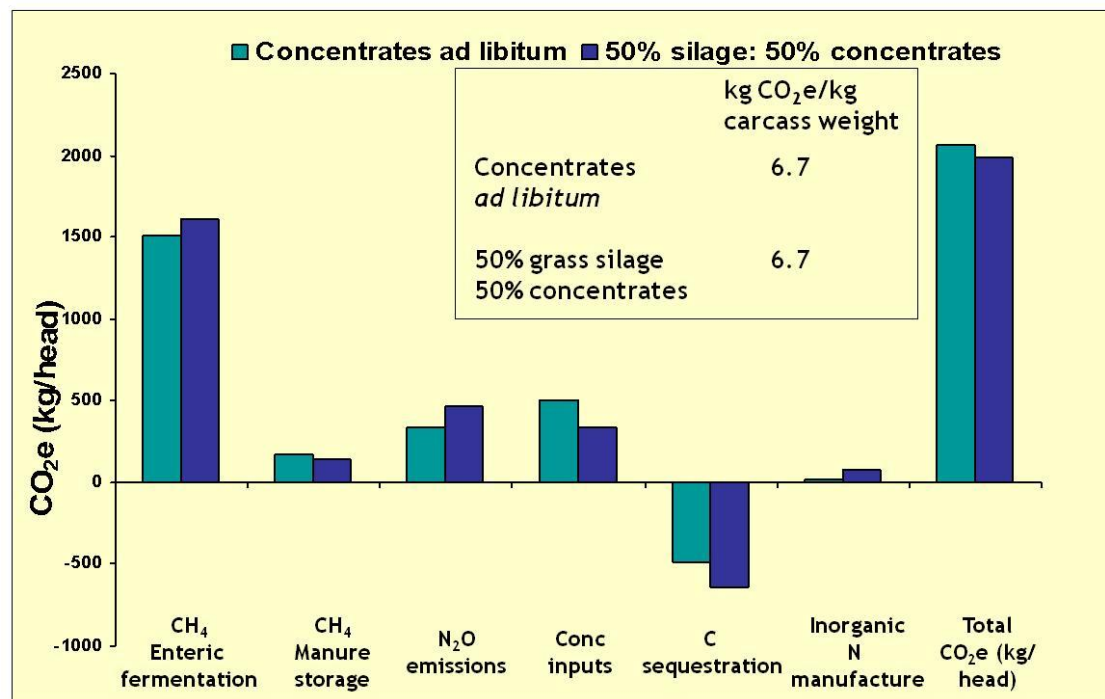
Average Growth Rate Data



BACKGROUND

- ◆ NI Programme for Government - 25% reduction in GHGs by 2025
- ◆ Work underway to establish more accurate GHG emissions from various classes of livestock
- ◆ Need to monitor GHG emissions at national and individual farm level

Effect of increasing the percentage of forage in the diet on carbon footprint (1)



BovIS

Bovine Information System

- ◆ Online GHG monitoring tool
- ◆ Linked with animal counts from APHIS
- ◆ Provides baseline values
 - enabling benchmarking
- ◆ Exploration of mitigation strategies
- ◆ Expected online late 2011

Bovine GHG Calculator

Land & Crop Liveness Grazing/Forage Fertiliser Organic Manure

Dairy Land and Crop Details

Enter details of land controlled (only include land attributable to the dairy enterprise)

Land owned (ha):

Land leased in (ha):

Land Let out (ha):

Crop details

Crop Name	Area (ha)	Yield (Tonnes DM/ha)
Grass Pasture	34.20	11.50
Cereal Crops	<input type="text"/>	<input type="text"/>
Oilseed Rape	<input type="text"/>	<input type="text"/>
Forage Maize	<input type="text"/>	<input type="text"/>
Peas and Beans	<input type="text"/>	<input type="text"/>
Forage Swedes and Turnips	<input type="text"/>	<input type="text"/>
Fodder Beet and Mangels	<input type="text"/>	<input type="text"/>
Kale	<input type="text"/>	<input type="text"/>
Potatoes	<input type="text"/>	<input type="text"/>

Generate Report