# Improving beef production efficiency through growth monitoring tools

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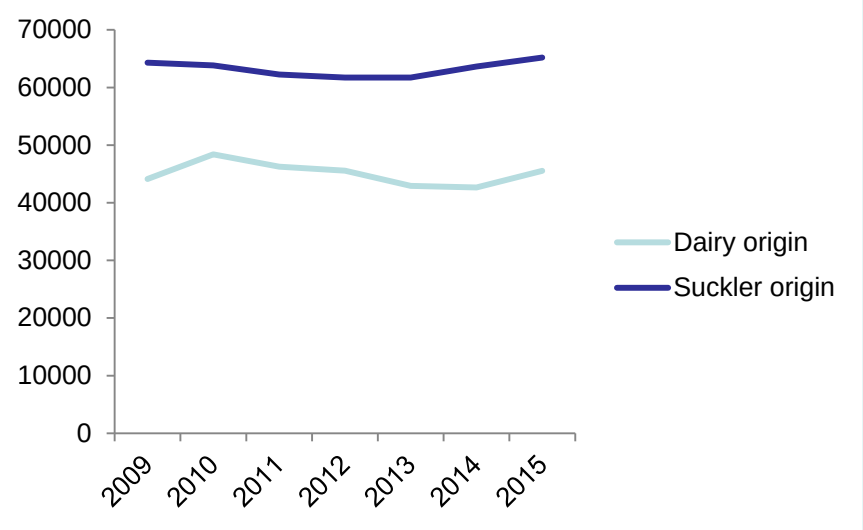
# Introduction to Northern Ireland beef industry (1)

## Size and scale of herds

- Suckler cows - 260,325
  - 15,090 herds
  - 17.3 cows per herd
- Dairy cows - 311,500
- Finishing herds (BovIS)
  - 9,510 herds
  - 38 animals slaughtered per year

Figure 1. Contribution of origin to annual carcass outputs in BovIS plants 2009-2015



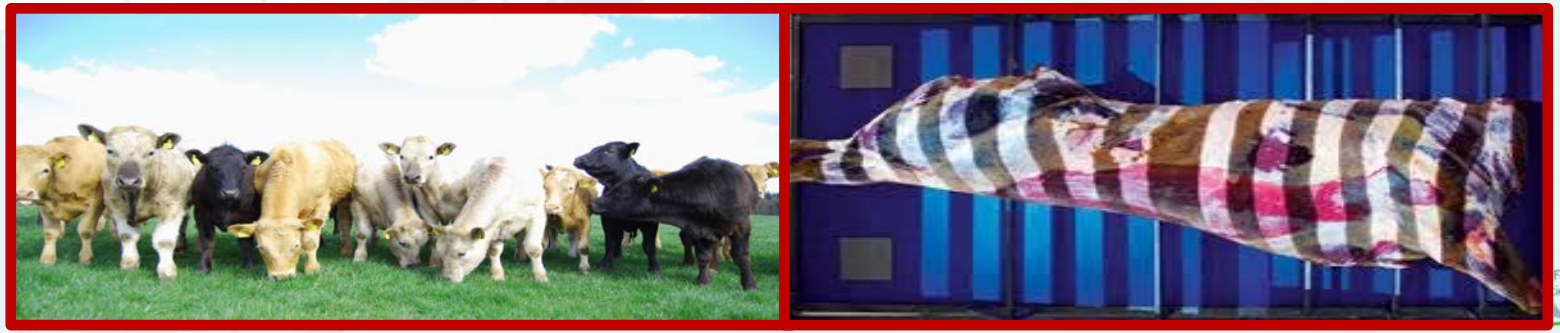
# Northern Ireland's integrated cattle database

- AFBI, through DAERA & AgriSearch funding have created the Bovine Information System (BovIS)

BovIS
Bovine Information System

Integration of government and industry data

- Animal and Public Health Information System (APHIS)
- Carcass data from NI abattoirs



# Integrating carcass data

BovIS
Bovine Information System

| APHIS Data |
| --- |
| Animal tag number |
| Abattoir code |
| Kill number |
| Kill date |

| Slaughter Data |
| --- |
| Animal tag number |
| Abattoir code |
| Kill number |
| Kill date |
| Class code |
| Conformation grade |
| Fat class |
| Hot weight |
| Cold weight |

| | |
| --- | --- |
| Breed | Sex |
| Sire breed | Date of birth |
| Colour | Dam date of birth |
| Dam tag number | Breed category |
| Dam breed | Herd number |
| Sire tag number | |

Department of Agriculture and Rural Development www.dardni.gov.uk
AgriSearch Farmer Funded Research
cafre College of Agriculture, Food & Rural Enterprise
LMC Livestock & Meat Commission
Foyle
abp Anglo Beef Processors
dunbia naturally better...
Linden FOODS
WD MEATS
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# Introduction to Northern Ireland beef industry (2)

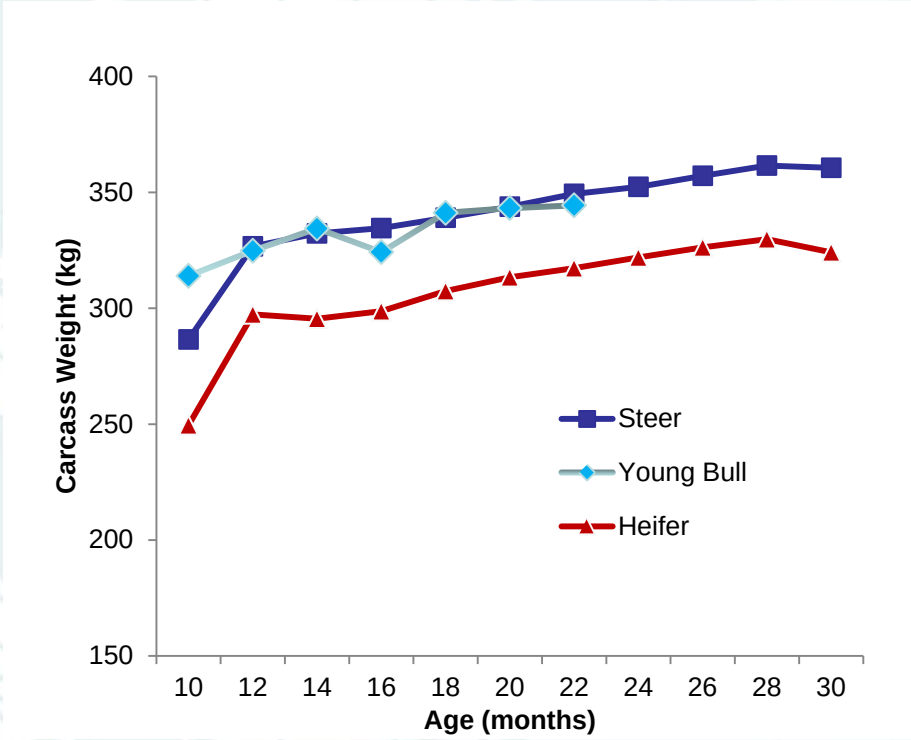
- BovIS (Bovine Information System) captures >90 % of all animal slaughtered in Northern Ireland
- Benchmark annual performance:

**Breakdown of type of cattle slaughtered in BovIS plants for the years 2009-2015**

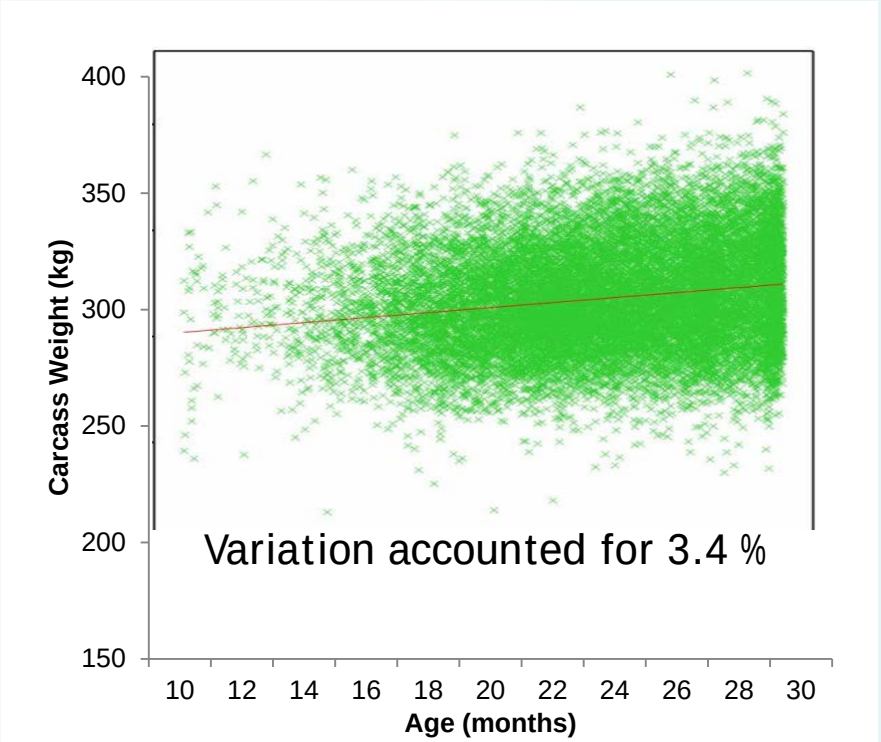
| Type | Proportion of cattle (%) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | Mean | SD |
| Young Bull | 11.0 | 14.7 | 11.1 | 10.9 | 14.3 | 8.9 | 7.2 | 11.2 | 2.69 |
| Steer | 38.8 | 37.6 | 39.0 | 38.7 | 35.2 | 40.3 | 43.3 | 39.0 | 2.47 |
| Heifer | 29.6 | 28.0 | 27.6 | 25.8 | 27.8 | 29.7 | 28.4 | 28.1 | 1.33 |
| Cow | 17.6 | 15.8 | 19.4 | 21.7 | 19.8 | 19.0 | 18.8 | 18.9 | 1.84 |
| Bull | 3.1 | 3.9 | 3.0 | 2.9 | 2.9 | 2.1 | 1.1 | 2.7 | 0.88 |

# Introduction to Northern Ireland beef industry (3)

**Relationship between age at slaughter and carcass weight (prime dataset)**




**Relationship between age at slaughter and carcass weight for prime steers, slaughtered 2015**

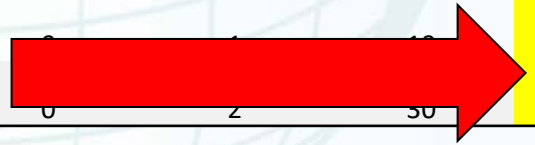


# Northern Ireland beef industry – challenges

- Reduce the variation in the performance of beef cattle

**Proportion of prime production by animal type and daily carcass gain**

| Animal type | Proportion cattle(%) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | <0.2 | 0.2-0.3 | 0.3-0.4 | 0.4-0.5 | 0.5-0.6 | 0.6-0.7 | 0.7-0.8 | >0.8 | Total |
| Young Bull | 0 | 0 | 1 | 6 | 18 | 24 | 20 | 31 | |
| Steer | | | | 43 | 26 | 8 | 2 | 1 | |
| Heifer | 0 | 2 | 30 | 46 | 18 | 3 | 1 | 0 | |



# Northern Ireland beef industry – challenges

- Suckler herd fertility
  - Average age of first calving = 31 months
  - Mean calving interval = 410 days

- Question:
- Why not calve suckler heifers at 24 months?

# Farmers choice:
# Reasons given for not calving at 24 months

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

**Donaldson, 1968 quoted:**

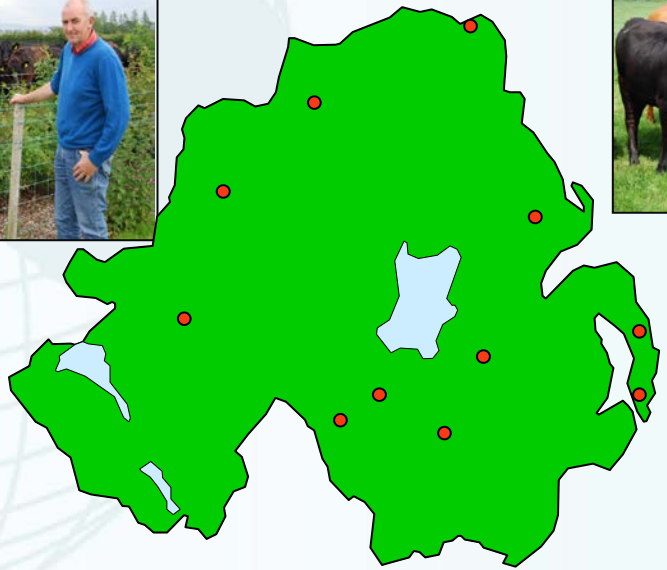
‘Beef heifers that calve at 2 years of age produce more calves in their lifetime than heifers that calve first at 3 years of age’

# OBJECTIVE

- Develop an online growth monitoring tool for:
  - Rearing heifers to successfully calve down at 24 months
  - Rearing cattle to meet a range of market specification targets
    - Bulls – under 16 months
    - Steers – 24 months
    - Heifers – 22 months

# Materials and methods (1)

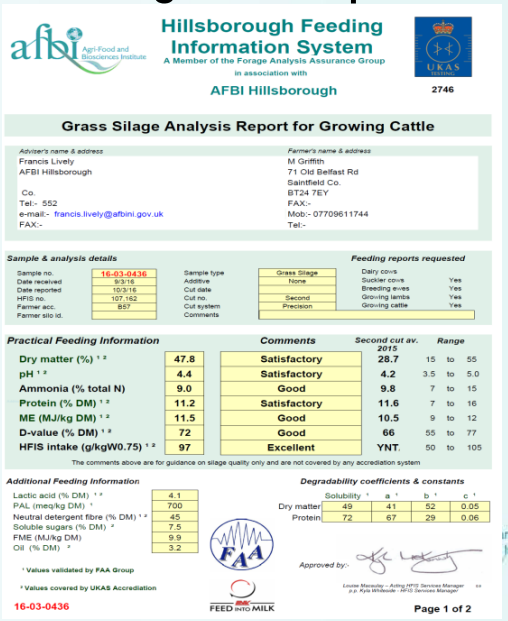
- Established a team of 12 on farm co-researchers
  - 6 suckler producers
  - 6 producers rearing dairy-origin beef



# Materials and methods (2)

- Set performance targets
  - Suckler producers to achieve 60 and 90% mature live weight at 14 and 24 months, respectively
  - Dairy-origin beef producers to meet a range of target end points:
- Animals weighed every 3 months

- Nutritional and veterinary advice provided



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**Hillsborough Feeding Information System**

A Member of the Forage Analysis Assurance Group in association with

AFBI Hillsborough

UKAS TESTING 2746

**Grass Silage Analysis Report for Growing Cattle**

| Adviser's name & address | Farmer's name & address |
|---|---|
| Francis Lively<br>AFBI Hillsborough<br><br>Co.<br>Tel:- 552<br>e-mail:- francis.lively@afbini.gov.uk<br>FAX:- | M Griffith<br>71 Old Belfast Rd<br>Saintfield Co.<br>BT24 7EY<br>FAX:-<br>Mob:- 07709611744<br>Tel:- |

| Sample & analysis details | | | | Feeding reports requested | |
|---|---|---|---|---|---|
| Sample no. | 16-03-0436 | Sample type | Grass Silage | Dairy cows | |
| Date received | 9/3/16 | Additive | None | Suckler cows | Yes |
| Date reported | 10/3/16 | Cut date | | Breeding ewes | Yes |
| HFIS no. | 107,162 | Cut no. | Second | Growing lambs | Yes |
| Farmer acc. | 857 | Cut system | Precision | Growing cattle | Yes |
| Farmer silo id. | | Comments | | | |

| Practical Feeding Information | | Comments | Second cut av. 2015 | Range | | |
|---|---|---|---|---|---|---|
| Dry matter (%) [1 2] | 47.8 | Satisfactory | 28.7 | 15 | to | 55 |
| pH [1 2] | 4.4 | Satisfactory | 4.2 | 3.5 | to | 5.0 |
| Ammonia (% total N) | 9.0 | Good | 9.8 | 7 | to | 15 |
| Protein (% DM) [1 2] | 11.2 | Satisfactory | 11.6 | 7 | to | 16 |
| ME (MJ/kg DM) [1 2] | 11.5 | Good | 10.5 | 9 | to | 12 |
| D-value (% DM) [1 2] | 72 | Good | 66 | 55 | to | 77 |
| HFIS intake (g/kgW0.75) [1 2] | 97 | Excellent | YNT. | 50 | to | 105 |

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

| Additional Feeding Information | |
|---|---|
| Lactic acid (% DM) [1 2] | 4.1 |
| PAL (meq/kg DM) [1] | 700 |
| Neutral detergent fibre (% DM) [1 2] | 45 |
| Soluble sugars (% DM) [2] | 7.5 |
| FME (MJ/kg DM) | 9.9 |
| Oil (% DM) [2] | 3.2 |

[1] Values validated by FAA Group

[2] Values covered by UKAS Accreditation

| Degradability coefficients & constants | Solubility [1] | a [1] | b [1] | c [1] |
|---|---|---|---|---|
| Dry matter | 49 | 41 | 52 | 0.05 |
| Protein | 72 | 67 | 29 | 0.06 |

FAA

FEED INTO MILK

Approved by:-

Louise Marsden - Acting HFIS Services Manager
p.p. Kyla Whiteside - HFIS Services Manager

16-03-0436

Page 1 of 2

# Example of set targets for rearing suckler heifer replacement

**Mature cow weight 650 kg**

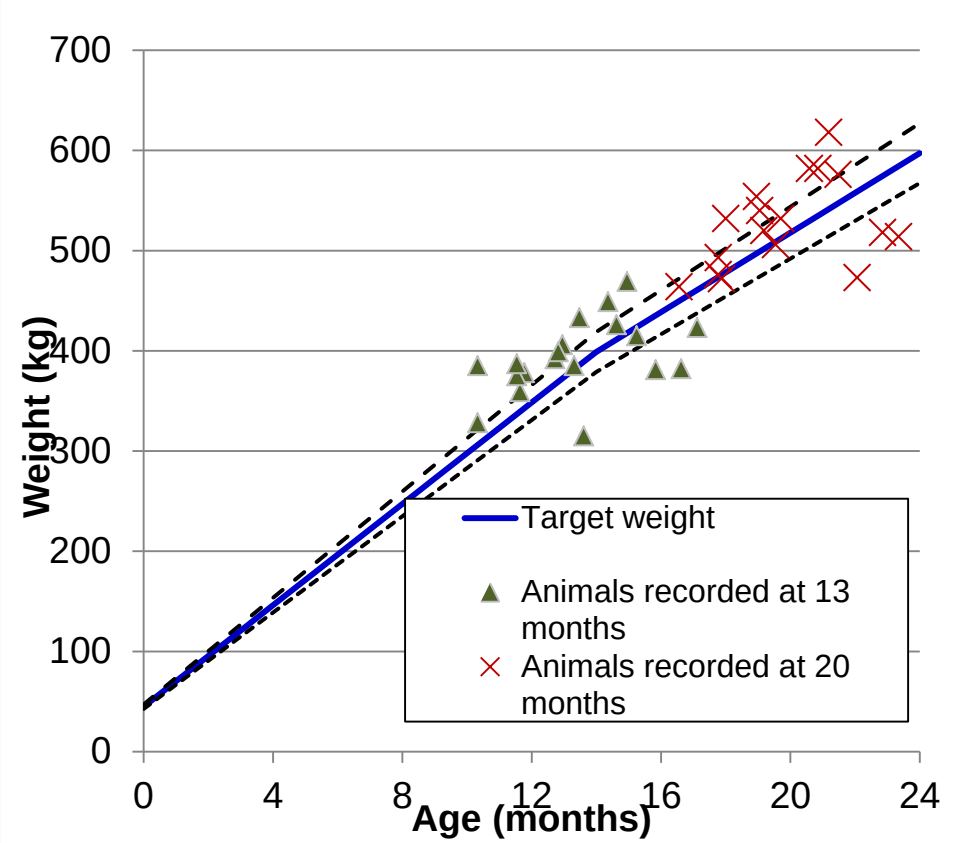
Bulling weight 60% mature weight at 14 months

Calving weight 90% mature weight at 24 months

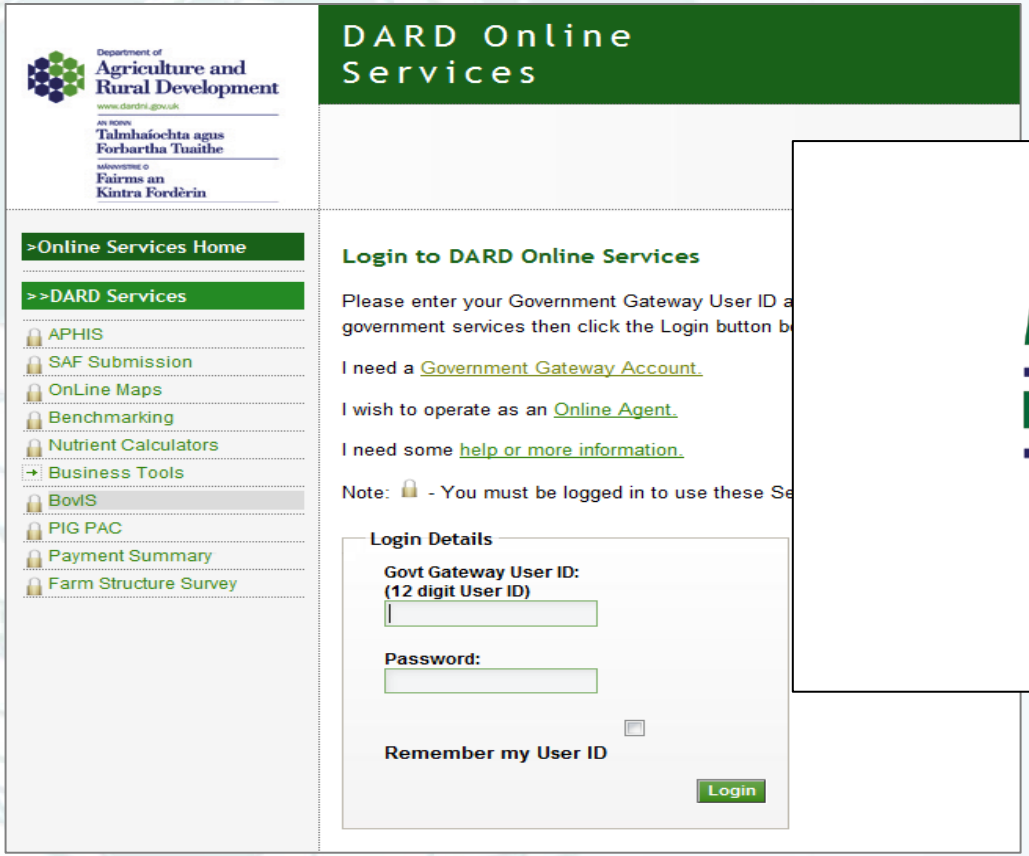
| Age (months) | Weight (kg) | Growth rate (kg/d) |
|---|---|---|
| 3 | 110 | 0.90 |
| 6 | 215 | |
| 9 | 280 | |
| 12 | 330 | 0.74 |
| 14 | 390 | |
| 18 | 480 | |
| 21 | 532 | 0.57 |
| 24 | 585 | |

# Example of farmer growth monitoring report

| SUMMARY | Spring 2010 |
|---|---|
| Mature cow weight | 650 kg |
| Target weight at 1st calving | 585 kg |
| Target weight at breeding | 390 kg |
| | |
| No. of animals | 19 |
| Age | 13 months |
| Live weight | 394 kg |
| DLWG achieved | 0.85 kg/d |
| | |
| No. of animals | 17 |
| Age | 20 months |
| Live weight | 527 kg |
| DLWG achieved | 0.80 kg/d |



# Development of online growth monitoring tool




BovIS

Bovine Information System

**Online Growth Monitoring tool**

10 YEAR ANNIVERSARY 2006-2016

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# Example of monitoring programme for 16 month old bulls

## 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 9[redacted]130 5 | M | Hereford | 24/10/2010 | 10.2 | |
| UK 9[redacted]131 6 | M | Hereford | 24/10/2010 | 10.2 | |
| UK 9[redacted]132 7 | M | Hereford | 24/10/2010 | 10.2 | |
| UK 9[redacted]134 2 | M | Hereford | 26/10/2010 | 10.2 | |
| UK 9[redacted]135 3 | M | Hereford | 29/10/2010 | 10.1 | |
| UK 9[redacted]137 5 | M | Friesian | 30/10/2010 | 10.0 | |
| UK 9[redacted]138 6 | M | Hereford | 31/10/2010 | 10.0 | |

« Previous Step | Get Growth Target Report »

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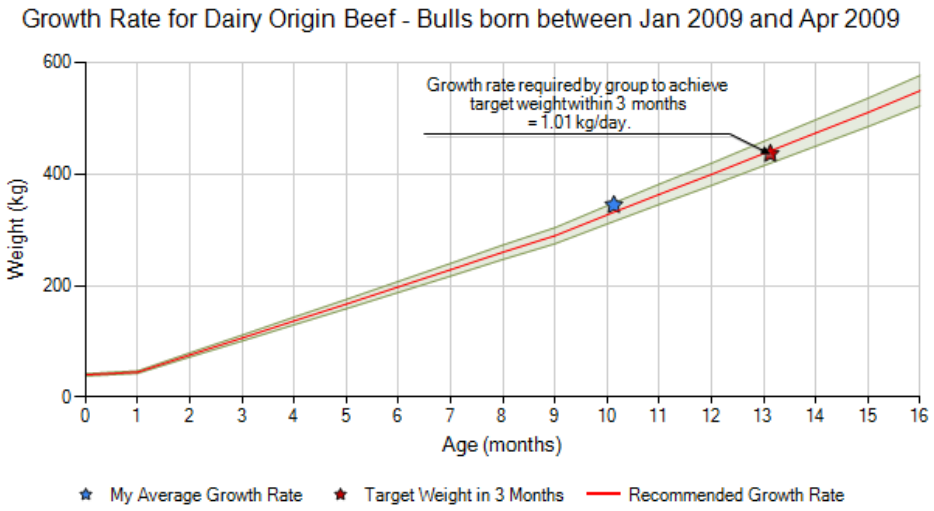
# Example of growth monitoring graph for 16 month old bulls

New Report | Print Report | Download Report

Animal Summary Table | Summary Chart | Individual Animal Chart

## Average Growth Rate Data

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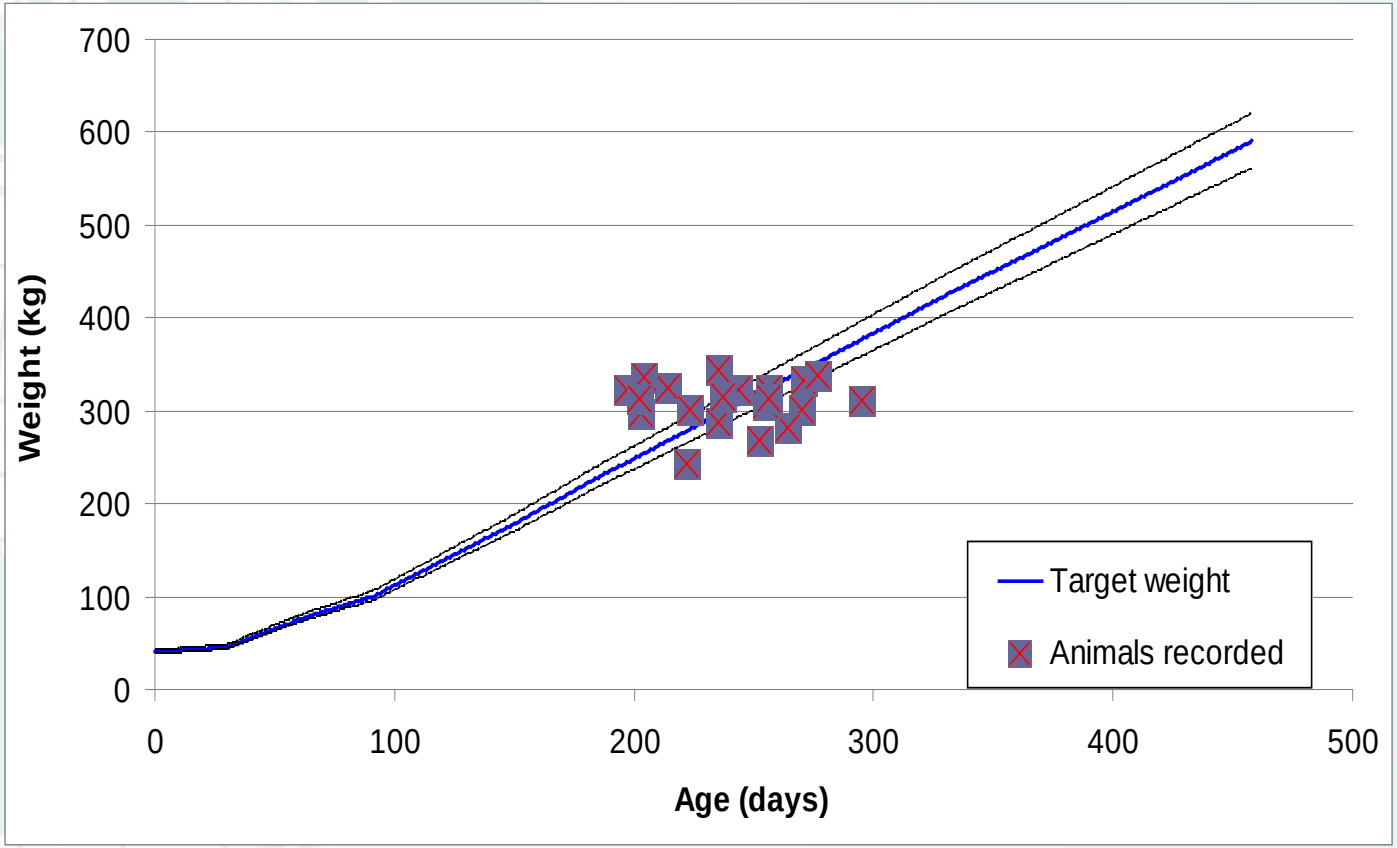
# Example of growth monitoring graph for 16 month old bulls



# Impact: age at first calving

| Farm | Age at first calving (months) | |
|---|---|---|
| | 2009/10 | 2011/12* |
| A | **23** | **23** |
| B | **32** | **24** |
| C | **30** | **27** |
| D | **-** | **26** |
| E | **30** | **24** |
| F | **26** | **25** |
| All | **28** | **24** |

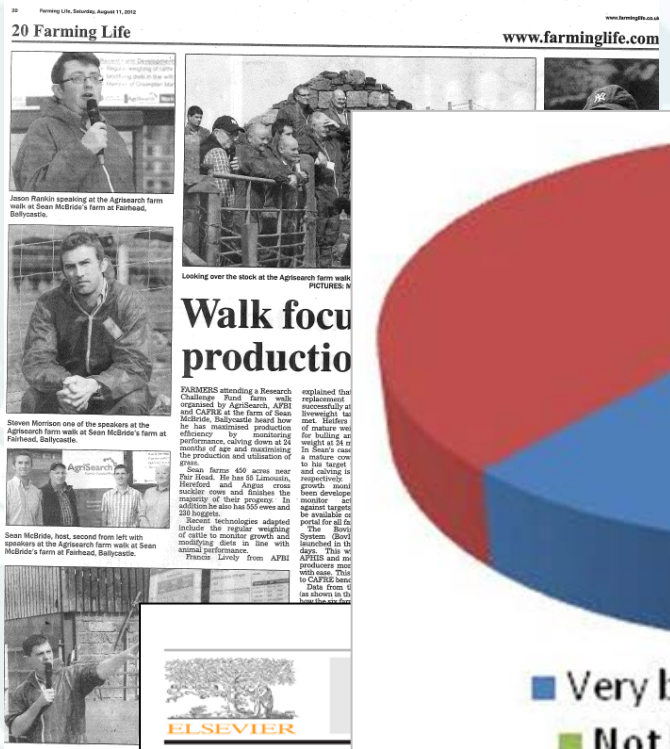
- 121 heifers were monitored to calve at 24 months
- First calving age reduced by four months
- Less than 5% veterinary assistance

# Impact: dairy origin beef

| Farm | Animal type | Targets | | | Estimated growth | |
|---|---|---|---|---|---|---|
| | | Age at slaughter (months) | Lwt (kg) | DLWG (kg/d) | Lwt at slaughter (kg) | DLWG (kg/d) |
| A | Bull | 10.5 | 410 | 1.16 | 450 | 1.19 |
| B | Heifer | 22.0 | 550 | 0.76 | 556 | 0.70 |
| C | Steer | 24.0 | 630 | 0.81 | 650 | 0.77 |
| D | Bull | 16.0 | 550 | 1.05 | 447 | 0.91 |
| E | Bull | 18.0 | 630 | 1.07 | 633 | 1.03 |
| F | Steer | 24.0 | 630 | 0.81 | 660 | 0.85 |

- Growth monitoring ensured target market specification was achieved

# Impact: across the industry



20 Farming Life

www.farminglife.com

Jason Rankin speaking at the Agrisearch farm walk at Sean McBride's farm at Fairhead, Ballycastle.

Looking over the stock at the Agrisearch farm walk

PICTURES: M

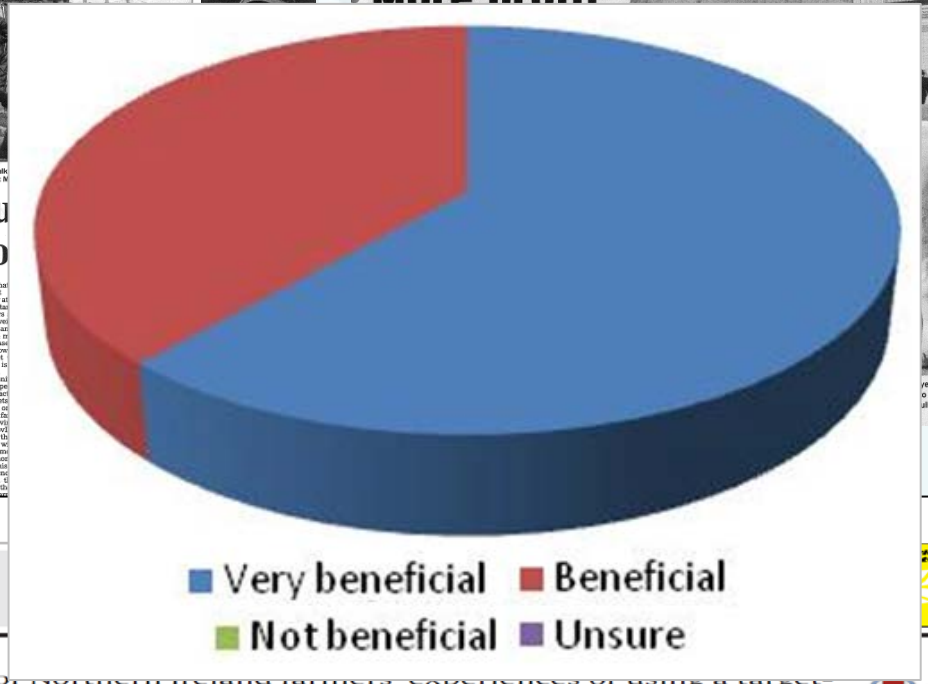
Walk focu

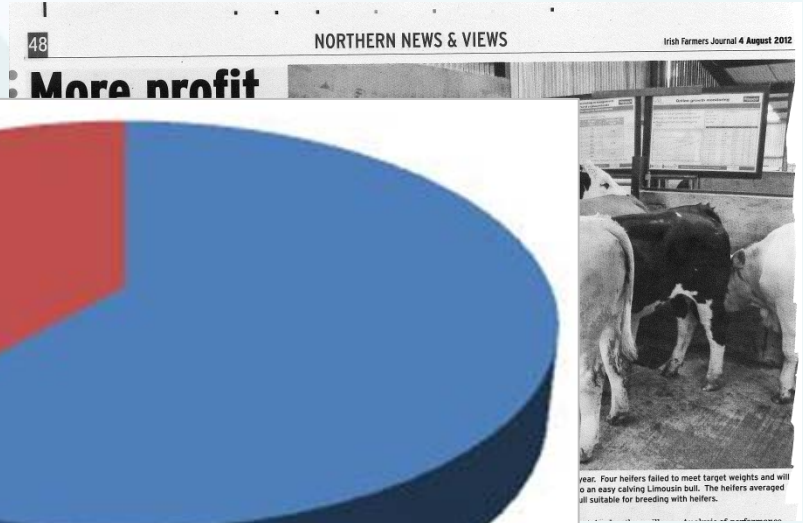
productio

FARMERS attending a Research Challenge Fund farm walk organised by AgriSearch, AFBI and CAFRE at the farm of Sean McBride, Ballycastle heard how he has maximised production efficiency by monitoring performance, calving down at 24 months of age and maximising the production and utilisation of grass.

Steven Morrison one of the speakers at the Agrisearch farm walk at Sean McBride's farm at Fairhead, Ballycastle.

Sean McBride, host, second from left with speakers at the Agrisearch farm walk at Sean McBride's farm at Fairhead, Ballycastle.



48 NORTHERN NEWS & VIEWS Irish Farmers Journal 4 August 2012

More profit

year. Four heifers failed to meet target weights and will o an easy calving Limousin bull. The heifers averaged ll suitable for breeding with heifers.

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## BovIS now available online

Since 2007 researchers at AFBI have been working on the development of a database that farmers can use to benchmark physical performance of their herds. The first phase of this database or Bovine Information System (BovIS) is now available on the rural portal (www.ruralni.gov.uk). To access the information producers must log in to DARD online services.

When logged on, farmers will be able to obtain a summary of the physical performance of all the cattle they have slaughtered from 1 January 2009. This includes the percentage of cattle that are 'in-spec' and a breakdown of the performance of progeny from various sires and dams.

They are also able to generate reports based on different breeds and categories (steers, heifers, young bulls, cows) and compare their performance against similar producers ranked in the top 10%.

At present the information is only available to the finisher who presented the animal for slaughter, but in time it is hoped that suckled calf producers will also be able to see how their cattle performed when killed.

The other major potential of BovIS is that it could eventually be used as a means of evaluating all the various breeds and breed types used across NI, and also all the different sires. The slaughter information already held on BovIS (which is being added to on a daily basis) could help the industry make real genetic progress by identifying the top performing sires and bloodlines.

ELSEVIER

CrossMark

An analysis of Northern Ireland farmers' experiences of using a target-driven beef heifer growth management plan and development of an empirical model leading to the launch of a decision support tool to promote first calving of beef heifers at 24 months

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# Conclusions

- AFBI in partnership with industry has developed an innovative online growth monitoring tool which has proven to:
  - Help producers to achieve optimum age at first calving
  - Help producers to deliver carcasses in line with market specification

- Collaborative model of industry working with producers, advisors and scientists is driving production efficiency

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# Acknowledgments


- 12 on-farm co-researchers

The Research Challenge Fund

Department of Agriculture, Environment and Rural Affairs
www.daera-ni.gov.uk

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