

Zimbabwe Herdbook Beef School 2019

Developments in Beef Breeding in the UK

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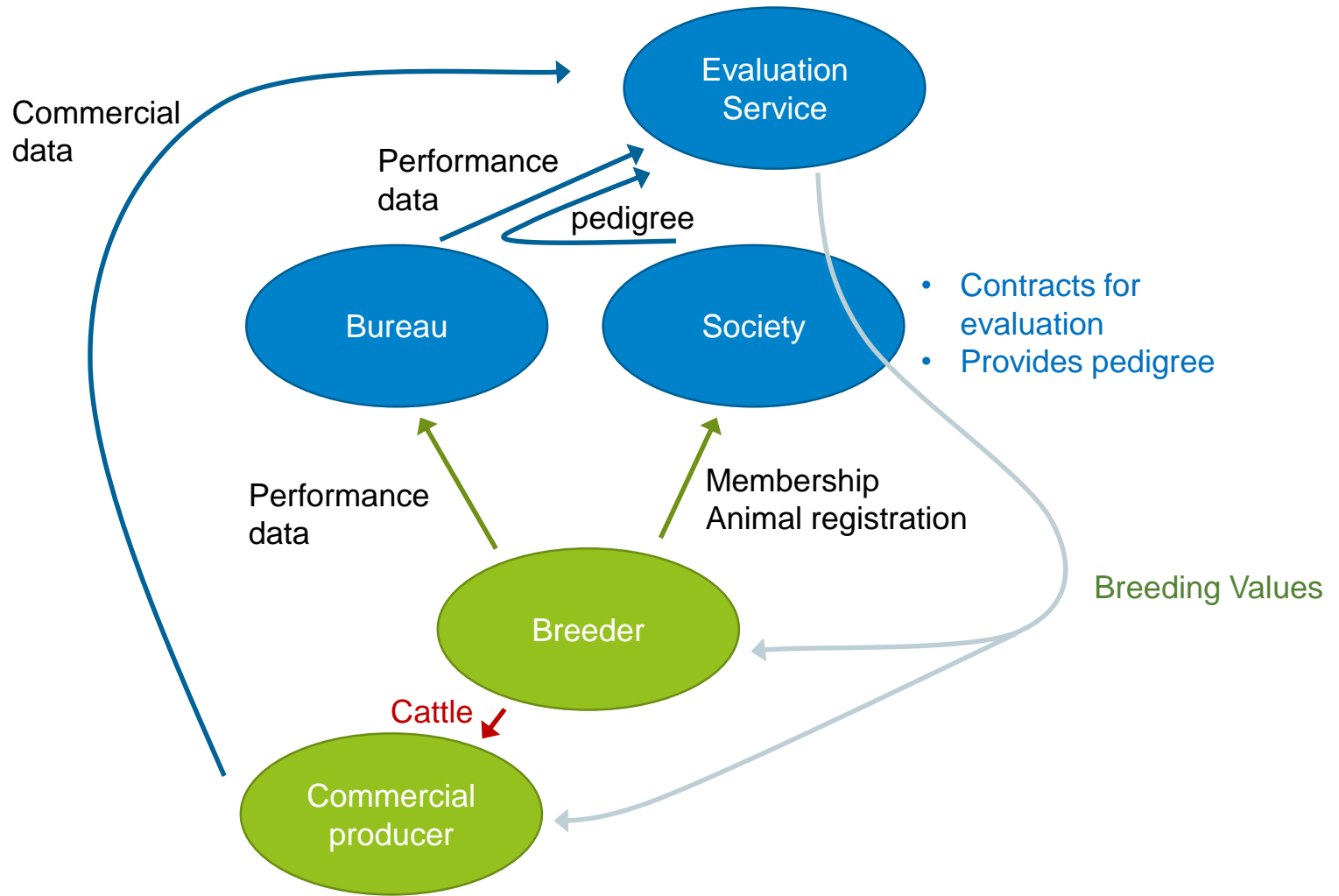


BEEF & LAMB

Overview

- Overview of breeding services in the UK
- Update on current R&D projects
- What next?

Performance recording and genetic evaluation



Genetic services landscape

	Sheep	Numerically small beef breeds	Limousin	Stabiliser	Other beef breeds
Performance recording					
Ultrasound scanning					
Genetic evaluations					
Research funding					

What determines Signet / AHDB involvement

- Market failure
- Impact

Signet objectives

1. To provide performance recording services to 500 flocks per annum covering at least 20 breeds, increasing the number of flocks submitting data online by 5% per annum over 5 years.
2. To provide ultrasound scanning for over 35,000 lambs per annum, increasing this to 40,000 lambs per annum in 5 years.
3. To increase the proportion of weight-recorded Terminal Sire lambs in pedigree flocks from 15% to 25% over the next 5 years – thus increasing the impact and value of recording services.

Service developments

- Development of new database
- National Terminal Sire evaluations for sheep

Current Research

Key breeding and genetics projects

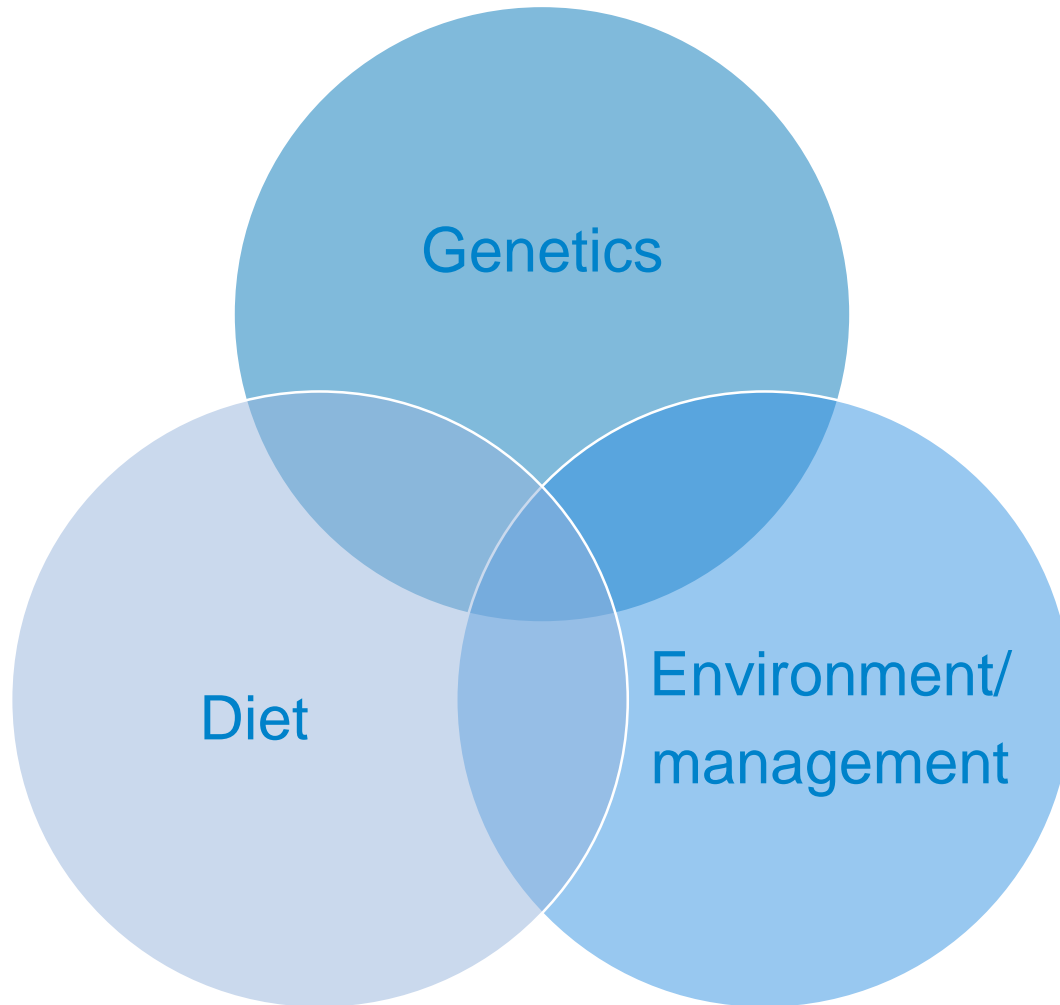
- Beef feed efficiency programme
- EBVs for carcass traits
- bTB genetic evaluations in beef cattle
- Further national evaluation
- Ram Compare
- Defra scoping study
- iSAGE

The logo for the Beef Feed Efficiency Programme features a blue silhouette of a cow standing on a green arrow that points to the right. The text 'BEEF FEED EFFICIENCY PROGRAMME' is written in white, bold, uppercase letters across the green arrow.

BEEF FEED EFFICIENCY PROGRAMME

- 4 year project
- Funded by Defra and AHDB £1.75M
- Led by AHDB & SRUC
- Scottish unit funded by Scottish Government and ABP

Components of feed efficiency

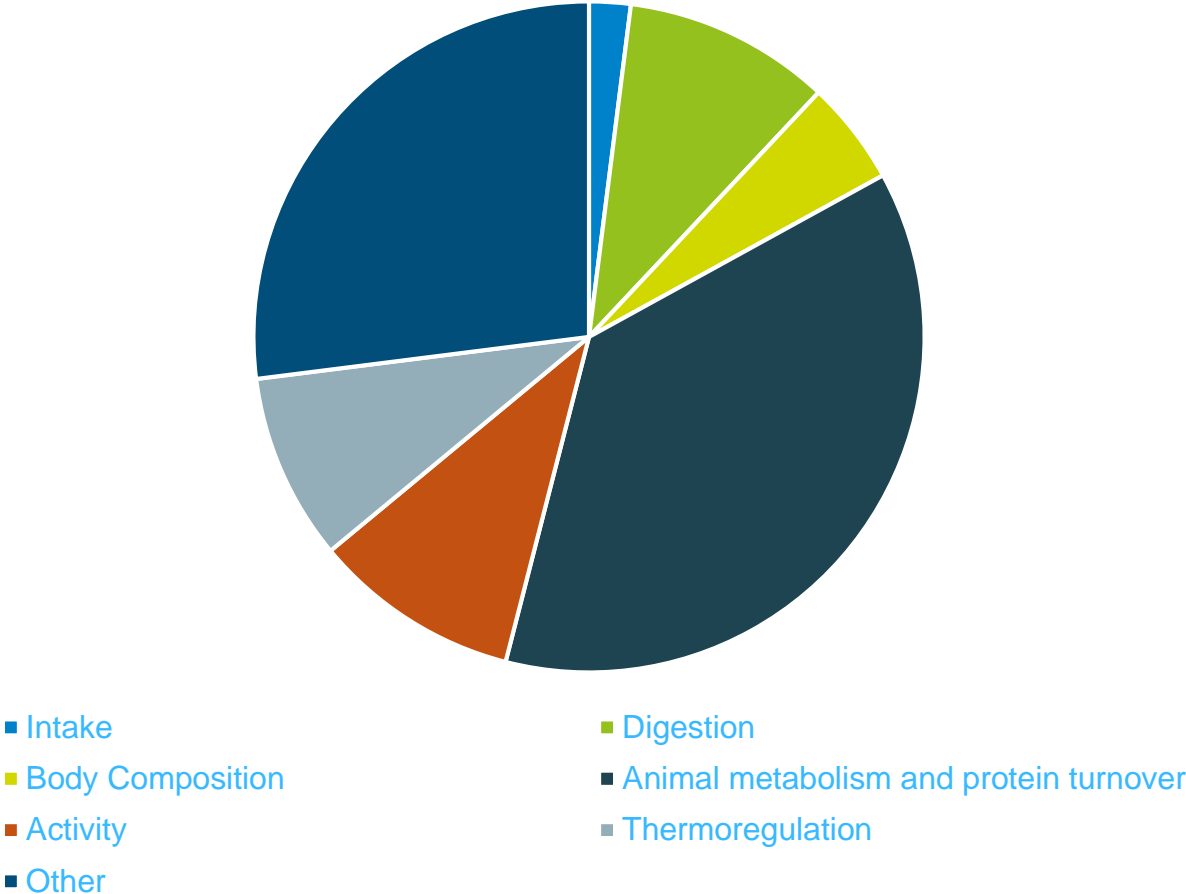


What is feed efficiency?

- (Gross) Feed Efficiency – liveweight gain / dry matter intake
- Feed Conversion Ratio – kg feed DM/kg weight gain (also called feed to gain F:G)
- Residual feed intake – Difference between actual and predicted intake (taking account of weight change, body weight and composition)
 - Independent of growth and mature size
 - Usually estimated as residual variation from regression
 - Can be incorporated in selection indexes as the individual traits with appropriate weightings

Biological factors contributing to Residual Feed Intake

% contribution to RFI



Richardson and Herd, 2004 cited by Retallick and Faulkner, 2012

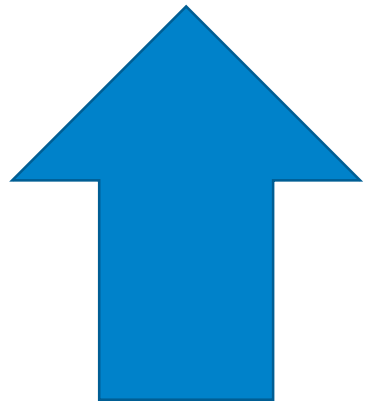


STOCKTAKE REPORT 2016

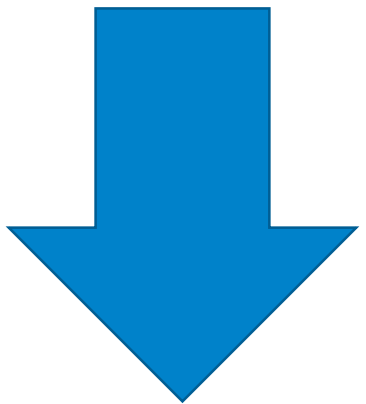
This document includes costings
for English cattle and sheep
enterprises in the year
ending 31 March 2016



Adding feed efficiency to selection indices



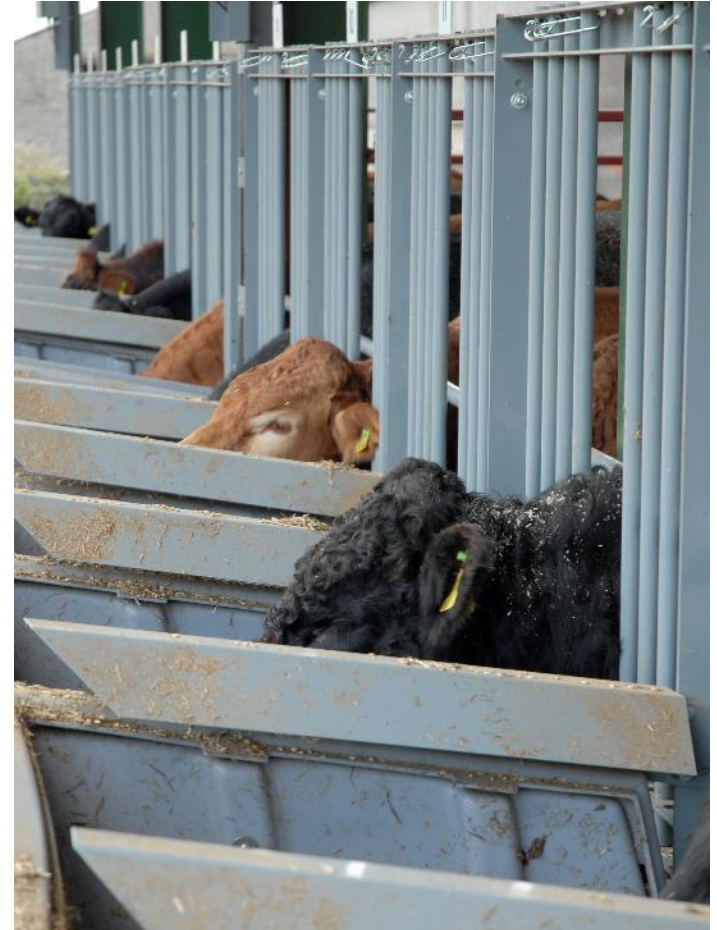
£ - 36%



GHG - 22%

Vision → Legacy

- demonstrate the ability to measure and select for feed intake parameters in cattle on commercial farms
- establish a system for recording after the end of the project that can be extended across cattle breeds.



Measuring feed efficiency

- GrowSafe feed intake recording equipment
- Known registered sire
- 7-12 months of age at trial start
- Measurement period 63 days
- Age range within batch 8-12 weeks
- Steers



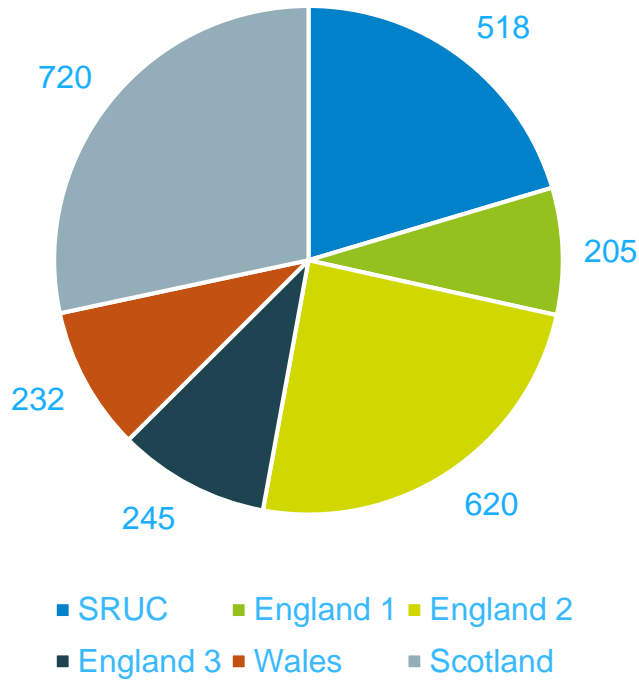
Industry benefits

- Identify individual animals and sires with superior genetics for feed efficiency
- Enable breeders to actively select for feed efficiency
- Development of model(s) for longer term legacy for industry
- ↓ GHG emissions

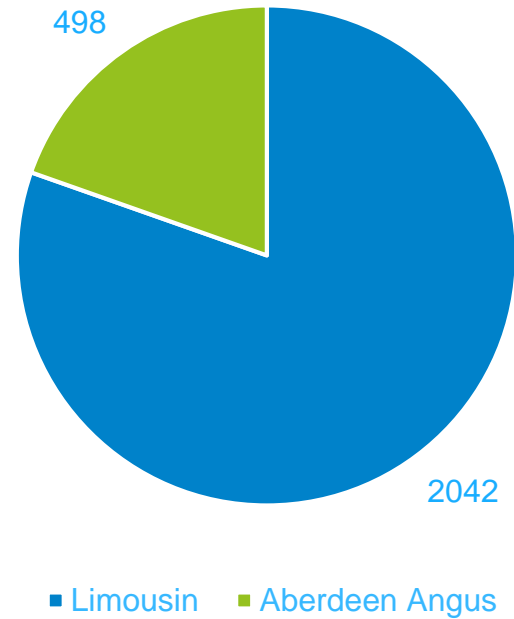


Records collected - 2540

Records collected by farm



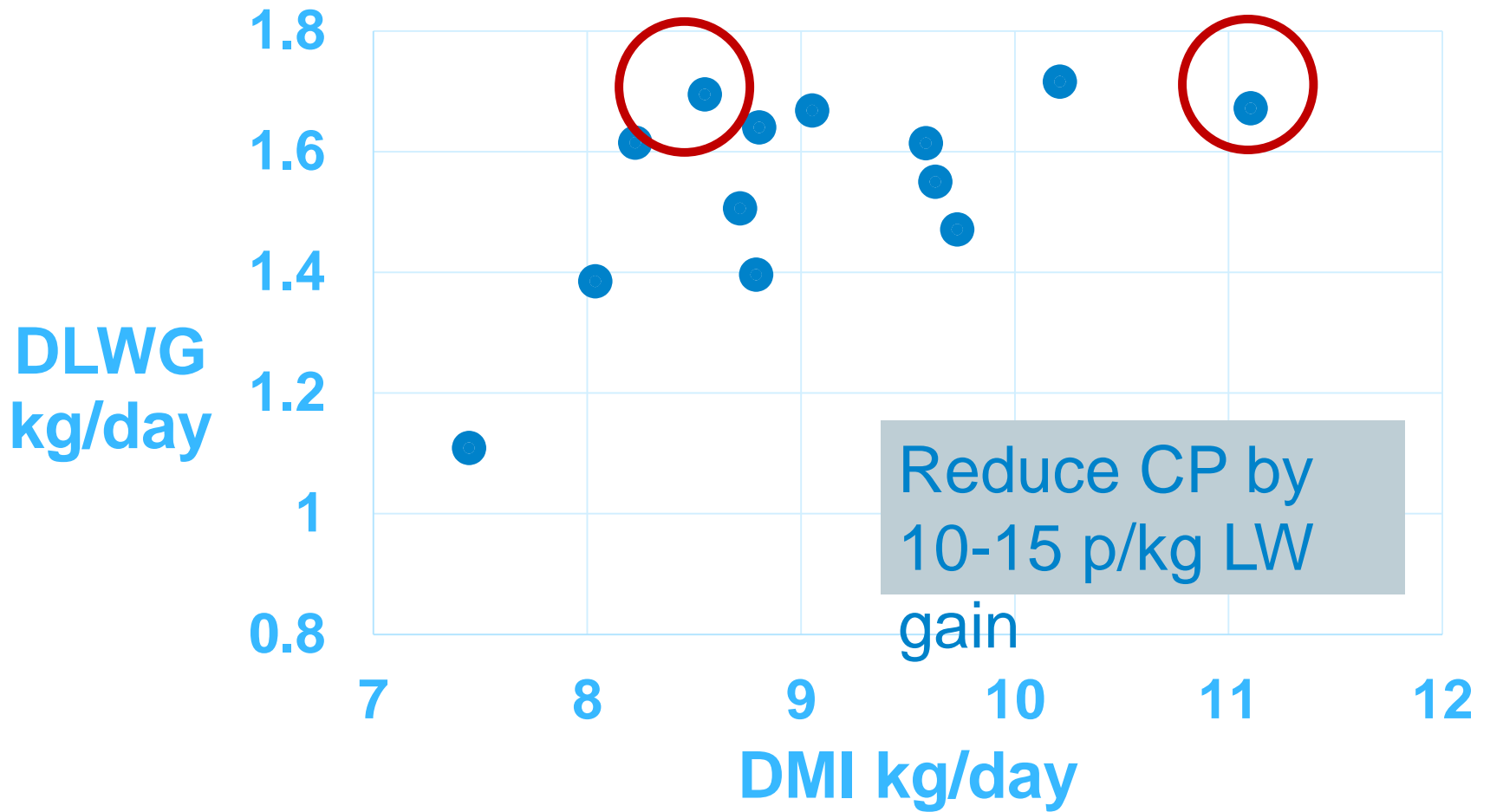
Records collected by breed cross



Challenges

- Sourcing calves – Dairy x Lim are in limited supply (Lim not a popular sire for dairy farmers)
- High price of weaned suckled calves
- Seasonality of market – heavily weighted on spring calving
- Logistics and cost of transporting small groups to the units
- Keeping batches tight enough in age and sire spec
- TB restrictions

Relationship between DM intake and growth rate by sire



Future principles

- Retain focus (breeding for feed efficiency)
- Fair use of the assets
- Maximum possible benefit to the British beef industry
- Revenue generated re-invested

Next steps – from a technical perspective

- Establish EBVs for Limousin
- Generate genetic parameters for Angus
- Open recording to all

- Genomic key
- Apply genetic parameters to other breeds?

• BUT.....



Who leads measurement programmes

- Breed society?
- Individual Breeders?
- Supply chain?
- Other options?

What is needed to deliver genetic improvement programme

- phenotypes - quality and quantity
- pedigree records
- access to a genetic evaluation engine
- an organisational structure that seeks to equitably distribute the costs and benefits of a national genetic evaluation.



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GrowSafe
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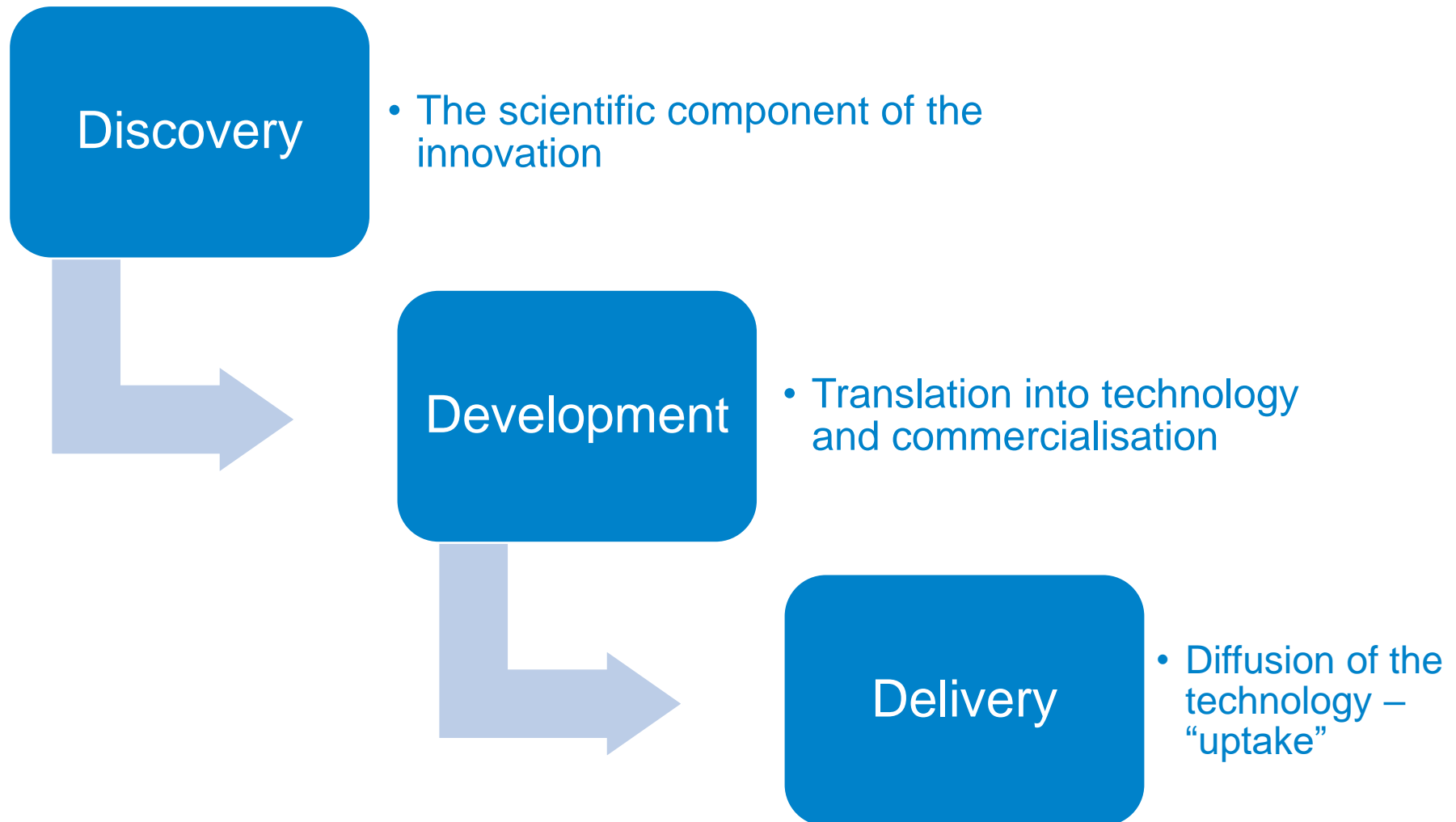
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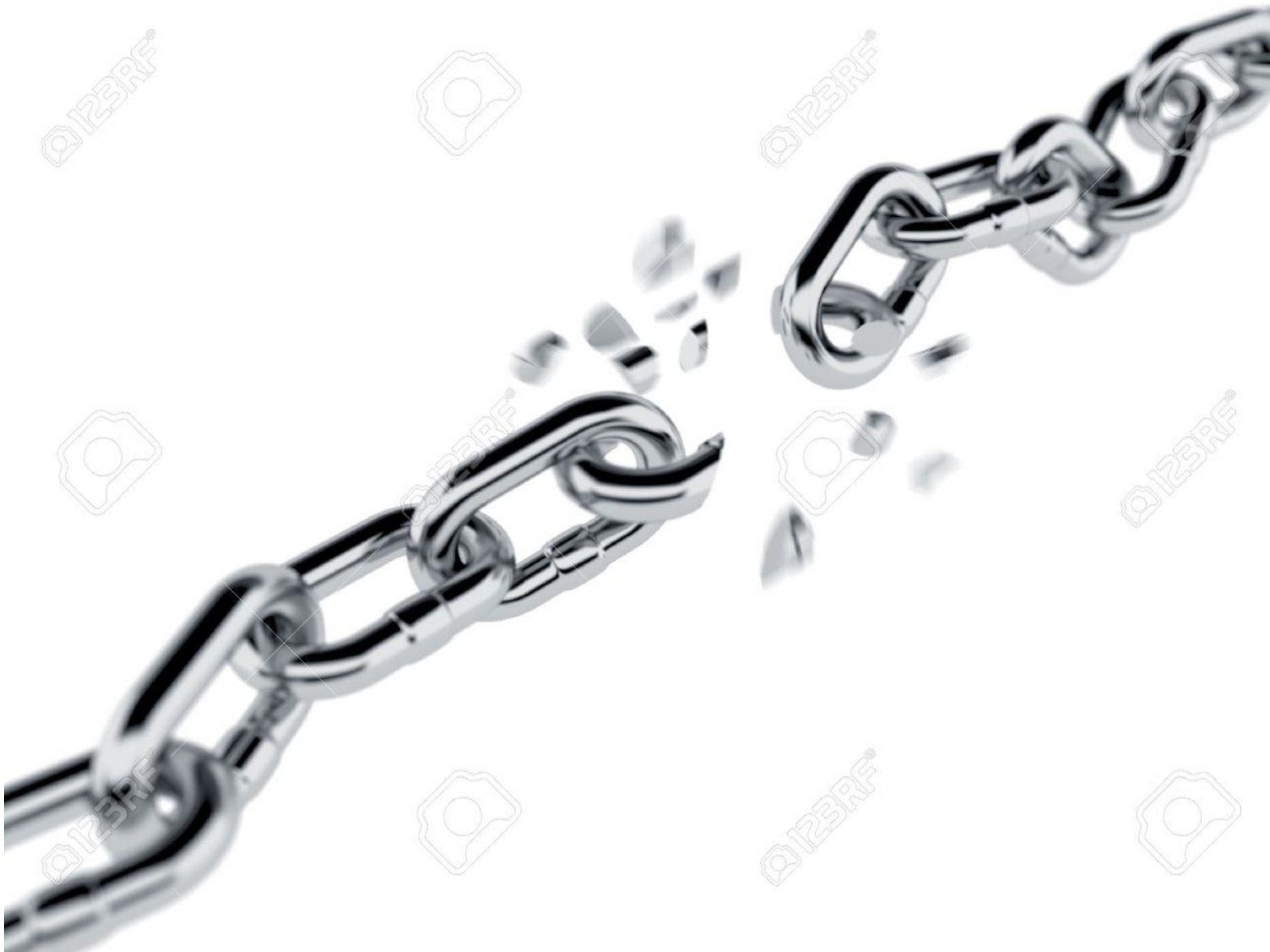
Components of agricultural innovations





Barriers to uptake – an Australian view

- General lack of appreciation of importance of feed costs
- High cost and complexity of recording individual animal feed intake
- Practical limitations, animal health concerns and overhead costs of centralised bull testing
- Reluctance of breeders to hand over control of their breeding stock to central facilities
- Minimal use of AI etc reducing ability to recoup costs.



123RF



123RF



123RF



123RF

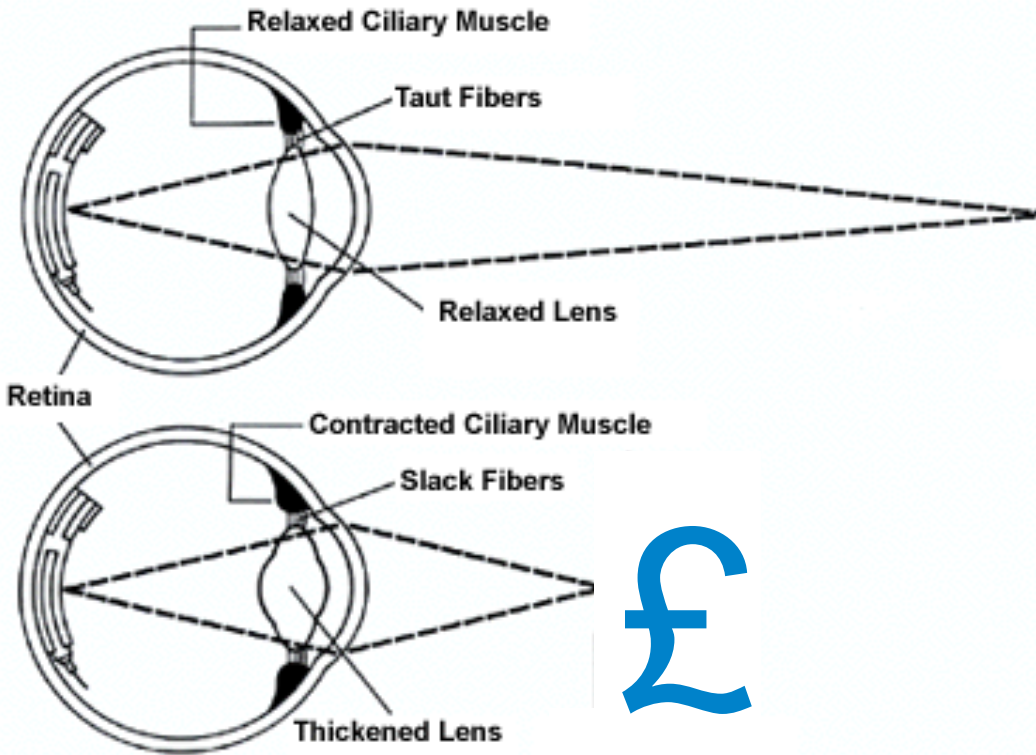
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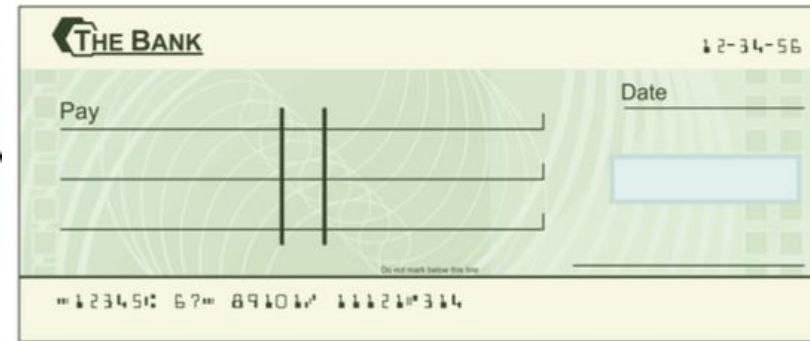


A change in focus



From:

Increasing output

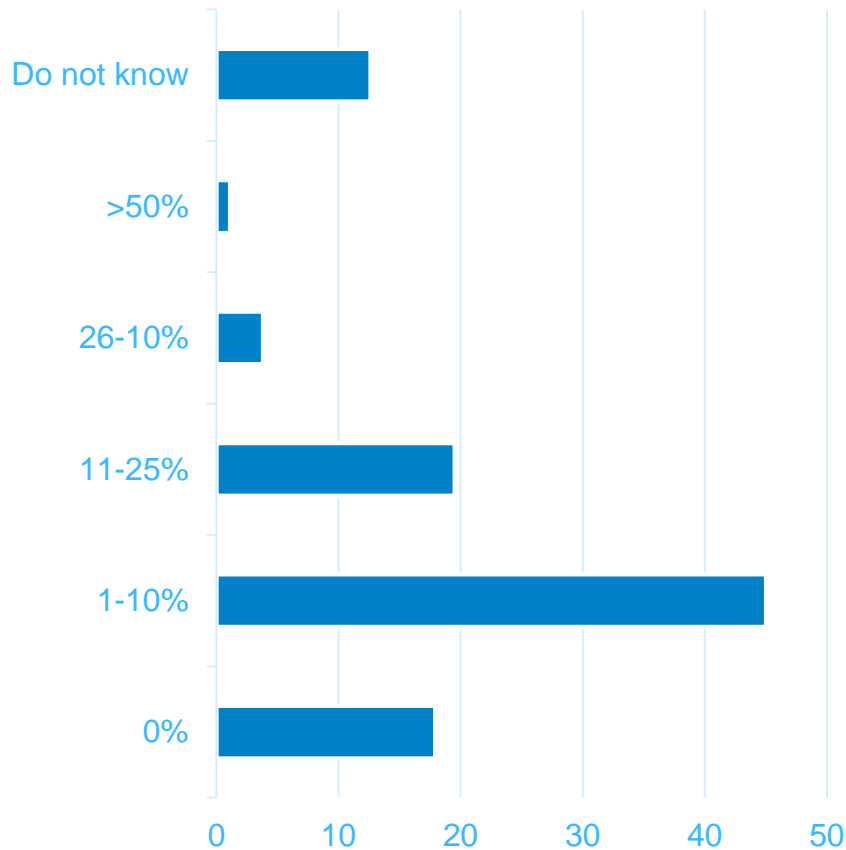


To

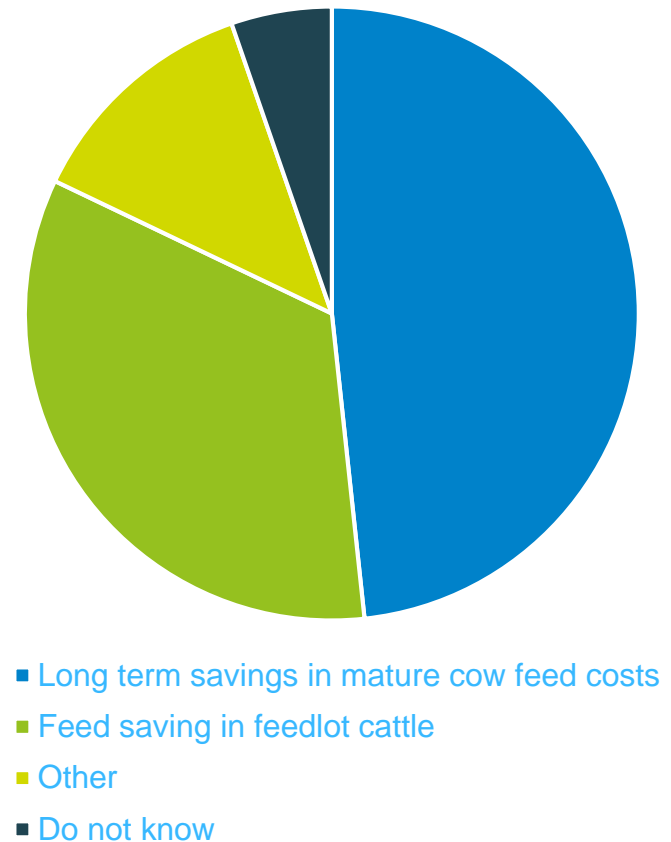
Input costs

Perceived willingness to pay among buyers for bulls evaluated for feed efficiency

"how much more are your buyers willing to pay?"



Primary factors that lead buyers to pay more



Options for the way forward

National programme

- Addresses sustainability targets
- Incentive
- Management?

Breed society

- Opportunity to share costs among membership
- Is it their top priority?

Supply chain

- Sharing of costs and benefits
- GHG story and corporate social responsibility

Building a sustainable model

- Market recognition
- Supply chain linkage
- Reward for delivering reduced GHG emissions

In the meantime....

- Working on a follow on project for Defra
- Collecting further records
- Assessing impact on meat quality

National Beef Evaluations

AHDB National Beef Evaluations

Generation of EBVs from commercial data sources

- Births, deaths and movements
 - British Cattle Movement Service
- Carcase weight, fat and conformation
 - UK Beef processors
- Health data
 - Animal and Plant Health Agency

Data sources are combined using UK eartag ID



EUROP carcasse trait EBVs

- Funded in several phases
 - Phase 1, 2012: demonstrate suitability of data
 - Phase 2, 2014-16: production of EBVs
- Nearly 7 million abattoir records
 - 7 companies (many more sites)
 - 2001-2018 (not all sites have data in all years)
 - Data continues to flow weekly from some sites



Phase 1 – Carcasse traits (released Nov 18)

- Age at slaughter (days)
- Carcasse weight (kg)
- Carcasse fat class (EUROP)
- Carcasse conformation (EUROP)
- Average daily carcasse gain (kg/day)

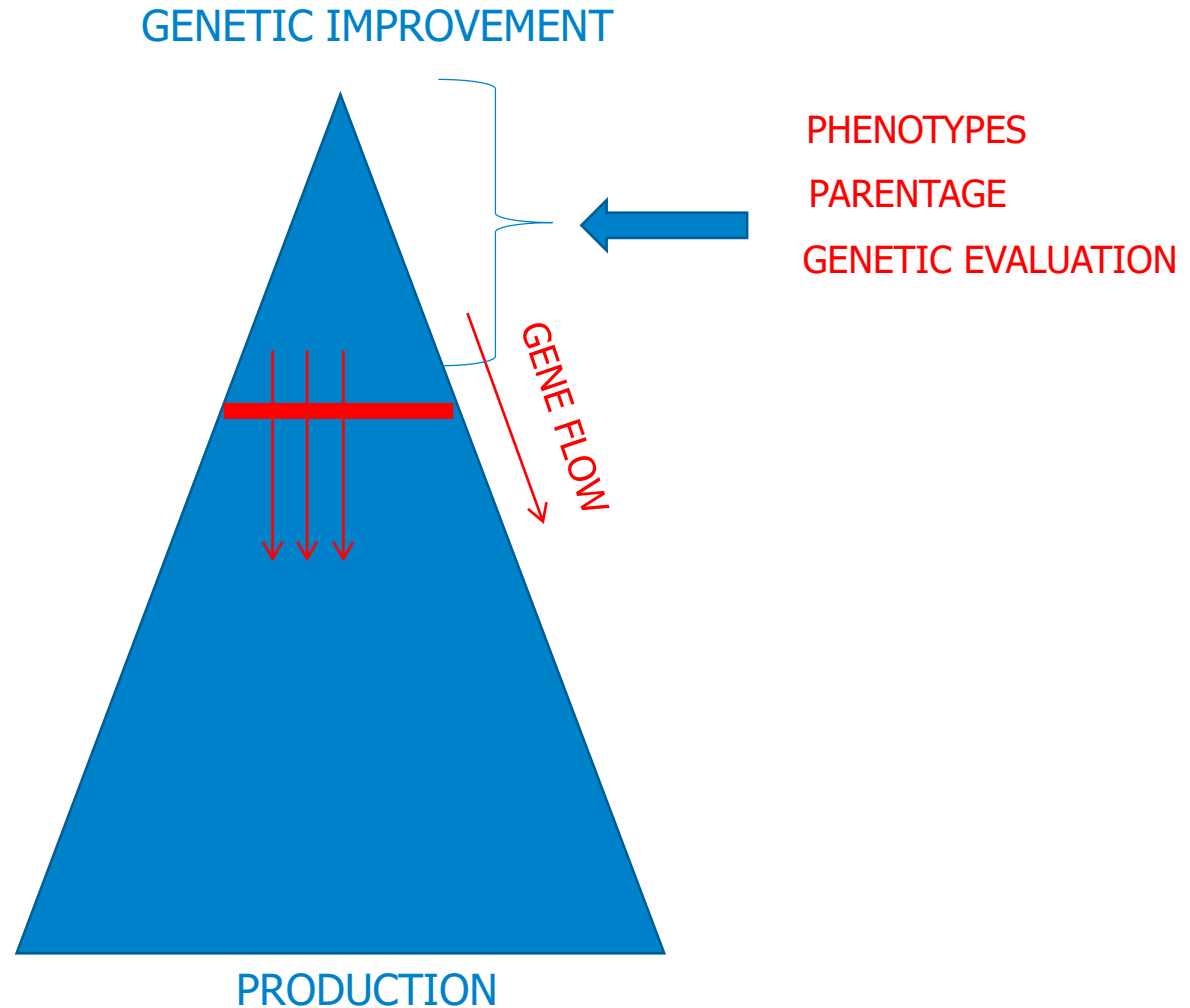
Phenotypes provided by UK beef processors

High heritability traits (0.4 – 0.6)



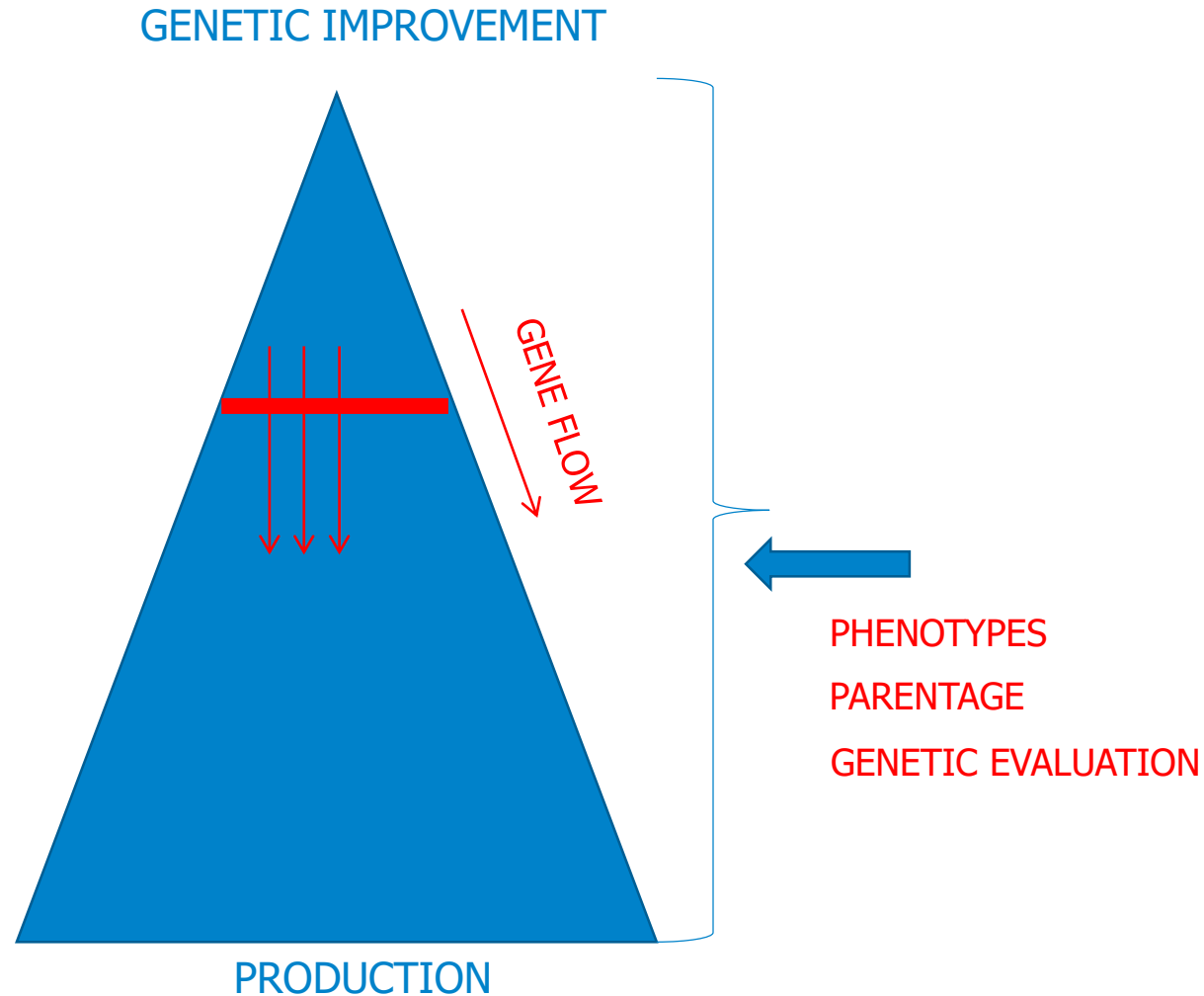
Benefits of genetic evaluation of pedigree animals

- Able to obtain phenotypes
 - Live weights
 - Ultrasound scans
 -
 - Dates of birth
- Able to form contemporary groups of animals treated alike
 - Often small
- Parent information
 - DNA testing



Benefits of genetic evaluation of commercial animals

- National databases can provide phenotypes with minimal effort from farmers
 - Large number of animals with phenotypes
 - Phenotypes often traits of direct economic importance
- contemporary groups possible based on herd and movement information in BCMS
 - Large numbers per CG
- Parent information
 - Not as well recorded on the sire side, but many animals



Data

- BCMS and abattoir data was combined containing carcass weight, conformation class, fat class and slaughter age
- After data quality edits ~1.5million records remained from seven UK abattoir companies

Trait	Heritability
Carcass Weight	0.40
Conformation Class	0.41
Fat Class	0.45
Days to slaughter	0.63



- 4944 Charolais bulls in carcass traits project dataset with 5+ progeny
 - The minimum accuracy value for carcass trait EBVs was therefore 63%
- 3916 of these could be matched to Breed Society records for which EBVs were available

Information currently available via Breedplan

	Count of EBVs reported Out of 3916 selected bulls	
Calving ease	3910	99.8%
Calving ease daughters	3910	99.8%
Gestation length	2132	54.4%
Birth weight	3513	89.7%
200 day weight	3320	84.8%
400 day weight	3320	84.8%
600 day weight	3320	84.8%
Mature cow weight	1685	43.0%
200 day milk	3465	88.5%
Scrotal size	1601	40.9%
Carcase weight	2223	56.8%
Eye muscle area	1917	49.0%
Rib fat	1921	49.1%
Retail beef yield percent	1919	49.0%
Intra-muscular fat percent	1025	26.2%

Important information that must be used when selecting bulls

Information from carcass traits project

Based on 3916 matched Charolais bulls

	Total records	Average per bull (Bulls selected had at least 5 progeny)
Progeny (Carcass traits analysis)	104763	29.1
Measured progeny (Carcass traits analysis)	113932	26.8
Ultrasound scanned progeny (Breedplan)	11204	2.9
Daughters (Breedplan)	4474	1.1

92% of sires in this subset will have no ultrasound scanned progeny in Breedplan analysis, as most will have been sold for commercial use












Results

- Relationships between traits tends to go in the expected direction
- Selection on existing traits will enhance abattoir attributes, however the relationship is not 100%
- This indicates the ability to make more progress with both sets of information



Delivery – Different routes for different breeds

We are not alone!

BREEDPLAN  breedplan.uns.edu.au	Aberdeen Angus  aberdeen-angus.co.uk	Beef Shorthorn  beefshorthorn.org
British Blue  britishbluecattle.org	British Charolais  charolais.co.uk	British Simmental  britishsimmental.co.uk
Hereford Cattle  herefordcattle.org	Murray Grey  murray-grey.co.uk	Red Ruby Devon  redrubydevon.co.uk
South Devon  sdhbs.org.uk	Welsh Black  welshblackcattlesociety.com	



**Agricultural Business
Research Institute**

The Carcase Traits Project

ing values produced as part of the Carcase Traits Project, an AHDB Beef and Lamb, AHDB Dairy and HCC funded research project undertaken by SRUC. This ana
data from BCMS, abattoirs and Breed Societies to produce Estimated Breeding Values (EBVs) for traits of economic importance.

Search for an animal:



Animal Details

Animal ID	UK542740500435	Date of birth	18/07/2012	Sire	UK96364155213
Prefix name	AUCHENLAY HITMAN ET	Sex	M	Dam	UK542740400231
Herdbooknumber	H-20121387				

Analysis

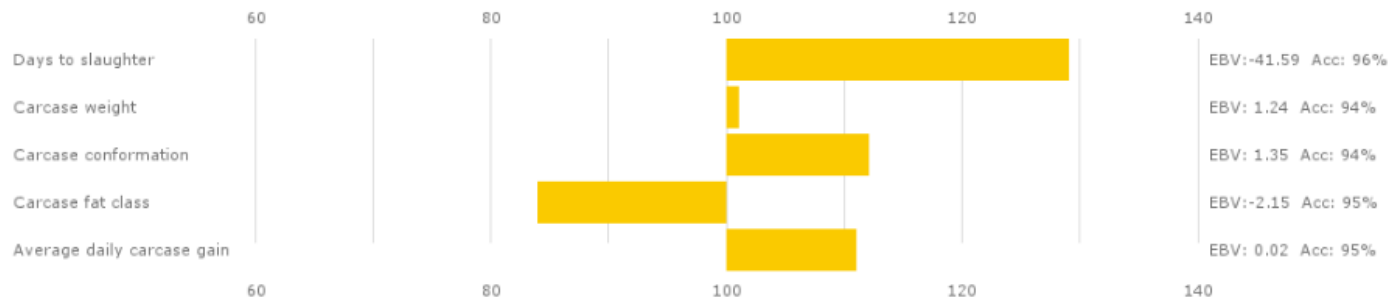
BLUP Analysis Date: 25/02/2019

Breed in analysis: british blue

Number of progeny with carcase records: 51

Breed group: **Continental**

Number of herds with carcase records: 22



For more information on the Beef Carcase Traits Project – please click on this link: <http://www.signetfbc.co.uk/beef-carcase-traits/>

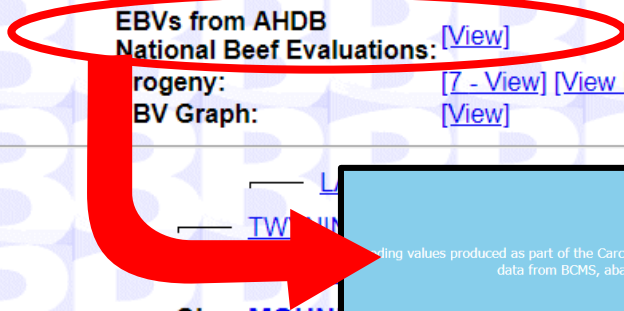


British Blue Animal Details

AUCHENLAY HITMAN

[Home](#) [Animal Enquiry](#) [EBV Enquiry](#) [Mating Predictor](#) [Member Enquiry](#) [Sale Catalogues](#) [Semen Catalogues](#) [Download Files](#) [Online Transactions](#)

HerdBook No.: H-20121387
Sex: Male
EarTag (UKxxx..): UK542740500435
Birth Date: 18/07/2012
Registration Status: Registered
Colour: White
Got by E.T.: Yes
Breeder: [R & M PATERSON](#)
Current Owner: COGENT BREEDING LTD
DNA Ref No.: W504673
EBVs from AHDB National Beef Evaluations: [\[View\]](#)
Progeny: [\[7 - View\]](#) [\[View by Herd\]](#)
BV Graph: [\[View\]](#)



Sire: [MOUN](#)

[PARK P](#)

Animal: [AUCHENL](#)

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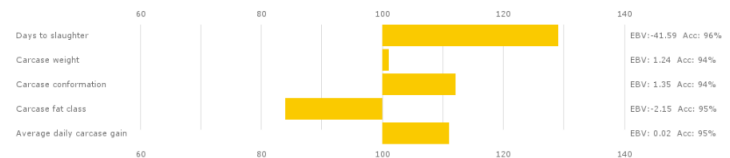
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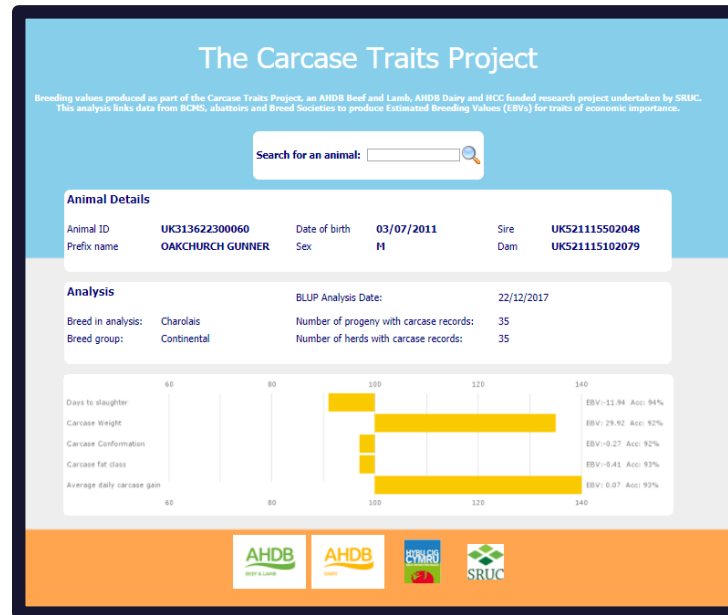


Why is Society involvement important?

- Communication
 - Encouraging sires to go onto BCMS passports
- Data
 - All UK cattle are present within BCMS records, but additional pedigree provide:
 - Additional sire information
 - Overseas parents – specifically French and Irish sires
 - Historical information to extend the pedigree
 - Society identifiers – names and herdbook numbers
- Feedback
- Implementation by pedigree sector

How will the data be used?

Pedigree breeders
 Assess herd
 Sell bulls / semen



Commercial farmers
 Assess current bulls
 Select new bulls
 Compare cows?

AI Company
 Check bulls
 Sell semen

Breed Society
 Monitor trends

Supply chains
 Assess impact
 Recommend sires

...and don't forget Dairy!

Prime cattle		Fat class → Increasing fatness							Total	
		1	2	3	4L	4H	5L	5H		
Conformation class	Improving conformation	E	0.0	0.2	0.3	0.1	0.0	0.0	0.0	0.7
		U+	0.1	0.9	2.3	1.1	0.2	0.0	0.0	4.5
		-U	0.1	1.4	6.1	6.4	1.4	0.1	0.0	15.5
		R	0.1	2.7	15.0	19.6	6.6	0.5	0.0	44.7
		O+	0.1	1.4	7.2	9.1	3.1	0.3	0.0	21.3
		-O	0.1	1.7	5.3	3.4	0.5	0.0	0.0	11.1
		P+	0.2	0.7	0.8	0.2	0.0	0.0	0.0	1.9
		-P	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.4
		Total	0.9	9.2	37.2	39.9	11.8	0.9	0.1	

Source: AHDB

Genetic evaluations for bTB resistance in beef cattle



Department
for Environment
Food & Rural Affairs



Concept

- Build on dairy R&D and experience
- Produce EBVs for beef cattle
- 2017-2019

Some preliminary data

Breed	No. sires	No. prog.	Prop. inf.
Aberdeen Angus	4,941	79,985	0.05
Blonde D' Aquitaine	1,433	19,531	0.06
Beef Shorthorn	703	7,088	0.05
Charolais	4,319	54,812	0.06
Devon	1,154	22,695	0.07
Hereford	3,697	41,250	0.07
Longhorn	442	4,353	0.07
Limousin	8,366	109,879	0.05
Salers	440	7,923	0.05
South Devon	2,383	46,852	0.06
Simmental	2,850	40,195	0.06
Belgian Blue	773	4,590	0.03

Issues

- Type of herd
 - Suckling, finishing
 - Dairy-bred progeny
- Age of animals
 - Breeding population, slaughter generation
- Gender
 - Entire males, females, castrates

Forthcoming projects

- Increasing access to cattle with EBVs
 - Delivering breeding values to commercial store buyers
 - Increasing use of high genetic merit sires through AI

#Shoutaboutthesire

Cattle type	Mean % sires recorded (2010 – 2017)
Beef	26.6
Dairy	11.7
Beef x Dairy	21.6
Overall	23.7

- BCMS is vital source of pedigree for beef and dairy beef cattle
- Missing sire has negative impact on breadth and accuracy of commercial evaluations (e.g. DCI, Calf Survival)
- Please support #Shoutaboutthesire campaign to encourage recording of known sires – press pack available

#Shoutaboutthesire



Did you know?

There are now carcase trait EBVs that will help you choose a bull based on the things you get paid for

These EBVs can only be generated if you record the ear tag number of the sire when registering a calf with BCMS

The more sires that are registered, the more accurate the EBVs will be

SIRE OF DAIRY BRED CALVES MATTER TOO!

45%

of all prime beef in England is a product of the dairy herd

CURRENTLY, ONLY **23%** OF SIREs ARE REGISTERED ON BCMS

TAKE OUR INDUSTRY HIGHER

#SHOUTABOUTTHESIRE

Thank you



A vibrant landscape of a green field at sunset. The sun is low on the horizon, casting a warm glow over the scene. The sky is filled with colorful clouds, and the field is lush and green. A path leads from the foreground towards the horizon. The overall mood is peaceful and inspiring.

**‘Inspiring our farmers, growers
and industry to succeed in a
rapidly changing world’**

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