



NORTHERN IRELAND AGRIHUB - PROPOSAL

AFSB LIVESTOCK GENETICS SUBGROUP

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OUTLINE OF PRESENTATION

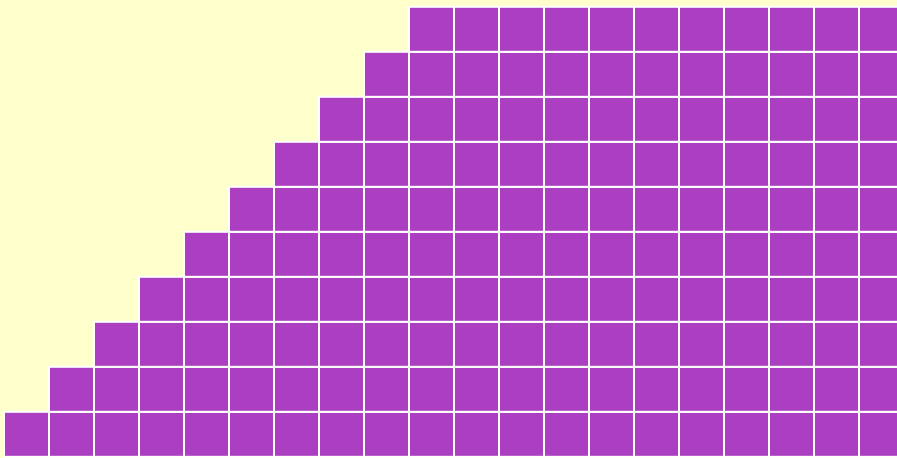
- Background to genetic improvement
- Key outcomes of the NI livestock genetics review
- Key recommendations



GENETIC IMPROVEMENT

- Long term strategic process
- Goal is to breed better animals for: particular traits or economically derived index of traits

Genetic Improvement
Permanent and Cumulative



If each increment of gain is valued at only £1000
Cumulative response £165,000



EXAMPLES OF LIVESTOCK GENETIC GAIN

1972



379 kg



100 kg

**15% less
feed**

**yet 25%
heavier**

2007



324 kg



125 kg

Slide Courtesy of Graham Plastow
Source: David Casey, Banff Pork Seminar 2010

EXAMPLES OF LIVESTOCK GENETIC GAIN

1957 broiler

1978 broiler

2005 broiler



400% in growth rate
50% in feed conversion efficiency

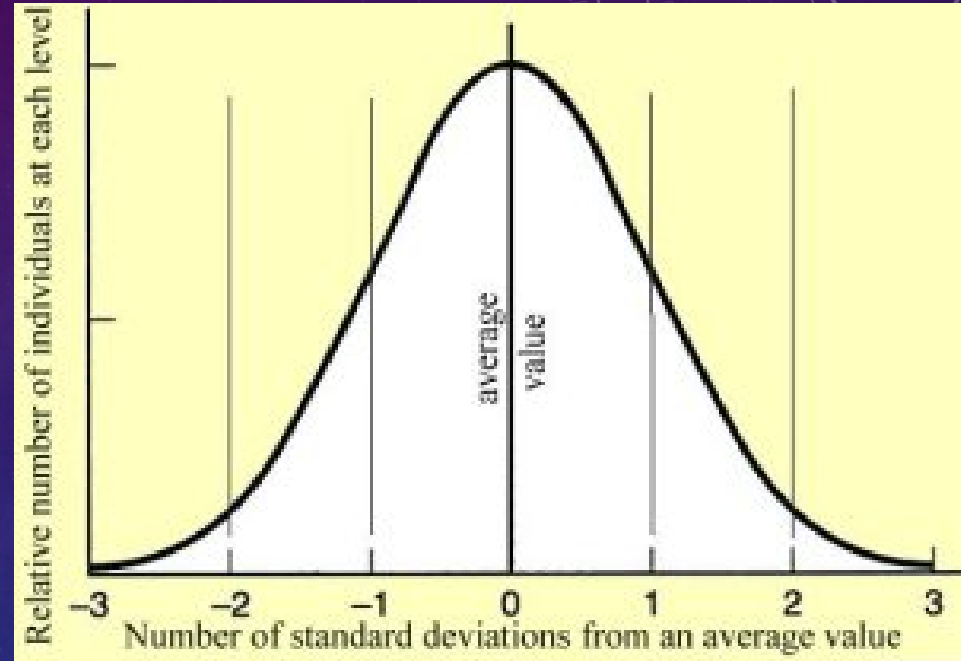
Source: The Poultry Research Centre, University of Alberta

(*Poultry Science* (2014) doi: 10.3382/ps.2014-04291)

ROUTE TO GENETIC IMPROVEMENT

Requirements

- Genetic variation
- Selection intensity combined with heritability
- Accurately identify superior animals



- Traditional breeding: Ancestry, performance
- Genomics: Relate patterns to proven animals

DATA, DATA, DATA

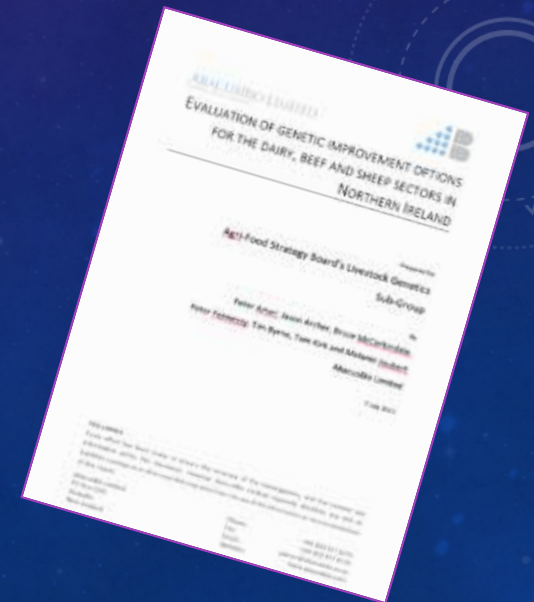


INDEPENDENT REVIEW - ABACUSBIO

- Commissioned by Genetics Subgroup of the AFSB

Key questions relating to livestock genetic gain

- How are we currently doing?
- Where could we be and how quickly could we get there?
- How best do we get there?
- What additional benefits will materialise?



BEEF: SUMMARY OF CURRENT GENETIC PROGRESS

✓ Major potential to improve the rate of genetic gain

Main reasons for low levels of gain:

- Focus on terminal traits
- Lack of focus on maternal traits
- Lack of integration of commercial data

BEEF GENETIC TRENDS TERMINAL SIRE PERFORMANCE

TRAIT	TREND 2009-2013
Beef Value (£ per calf born)	+0.810 
Gestation length (days)	-0.003 
Calving ease (% unassisted)	+0.006 

Adapted from Amer et al 2015

BEEF GENETIC TRENDS DUAL PURPOSE BREED PERFORMANCE

TRAIT	TREND 2009-2013	
Be Suckler cow weight 600 kg	+0.838	✓
Ge 650 kg	-0.013	✓
700 kg	-0.035	✗
Calving ease (% unassisted)	+1.919	✗
Mature weight (kg)	+0.065	✗
Calving interval (days)	-0.001	=
Age at first calving (days)	+0.009	✓
Longevity (years)		

Intake required for maintenance (100 cow herd)

600 kg -

650 kg +14 tonnes DM

700 kg +27 tonnes DM



BEEF: SUMMARY OF CURRENT GENETIC PROGRESS

✓ Major potential to improve the rate of genetic gain

Main reasons for low levels of gain:

- Focus on terminal traits
- Lack of focus on maternal traits
- Lack of integration of commercial data

✓ Current value of rate of genetic gain

- beef genetic gain in Northern Ireland valued at £1.9M per year
- potential to increase **X 1.8 to 4.5**

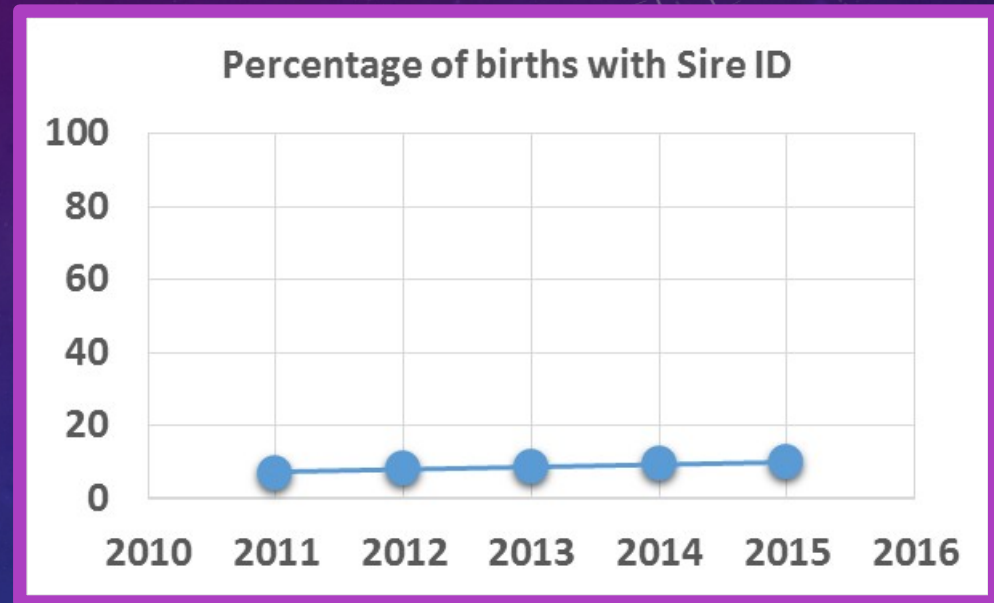
✓ Critical to remain competitive internationally

KEY RECOMMENDATIONS

- Investment in information structures, benchmarking and increased level of performance recording including **sire recording** and capture of commercial data – build on BovIS, APHIS

SIRE RECORDING

- Sire recording is a critical piece of data
- Without a sire ID, genetic evaluations are limited
- Increasing by 0.7% per year, but long way to go
- Proposed AgriHub will connect up sire recording from different sources, simplify the procedure and relate to animal/farm performance - **SHOW THE VALUE!**



KEY RECOMMENDATIONS

- Investment in information structures, benchmarking and increased level of performance recording including **sire recording** and capture of **commercial** data – build on BovIS, APHIS

data, information, knowledge, action

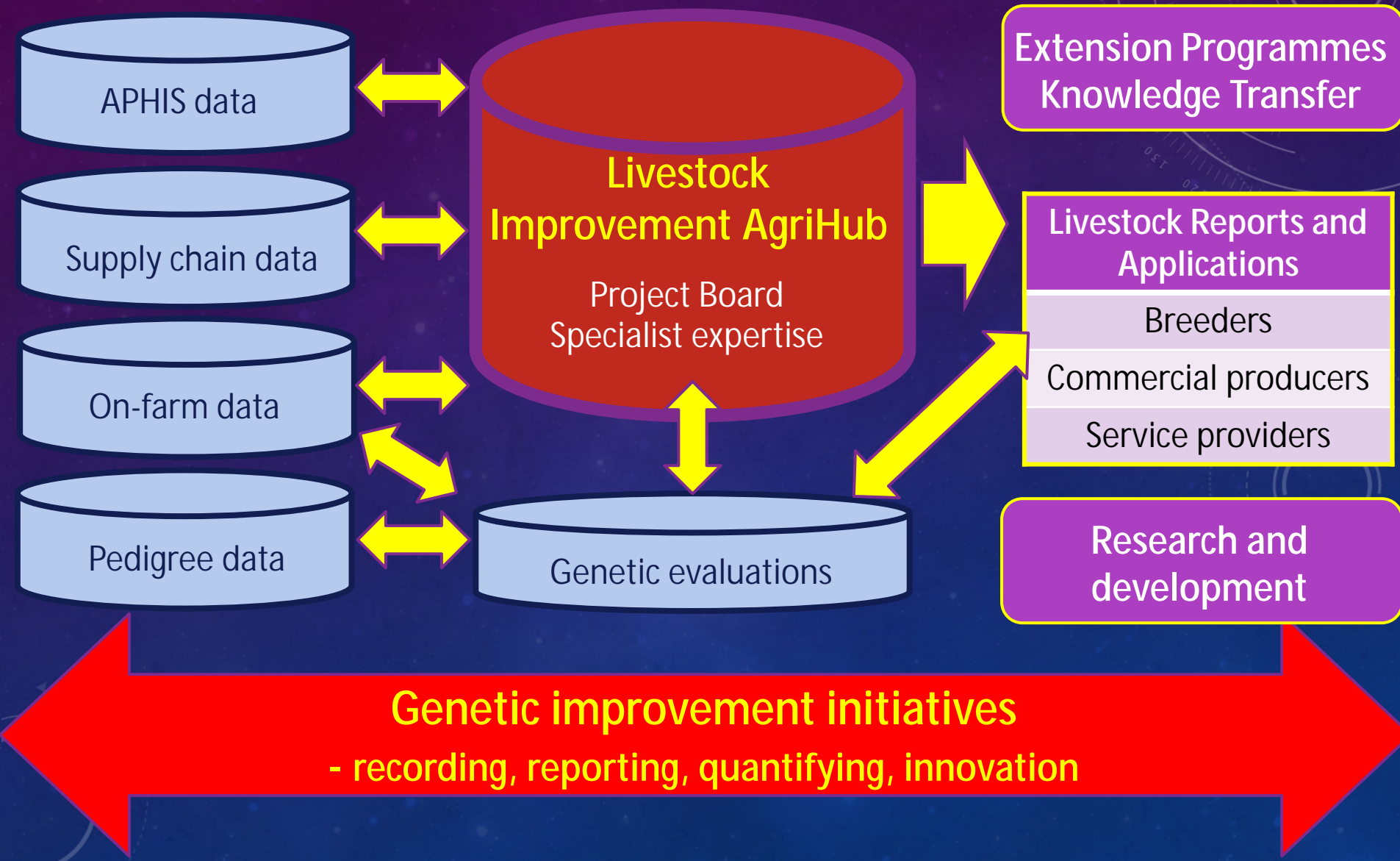
- Standardisation of recording protocols within UK & ROI with DNA collection from key animals

- **Collaboration**
- **Future genomics**

KEY RECOMMENDATIONS

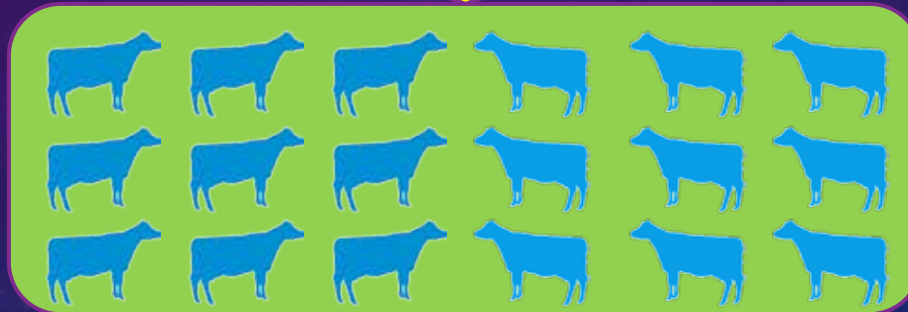
- Increased focus on maternal traits – data collected in commercial herds along with genotypes enabling involvement in international programmes e.g. Interbeef
- Quantification and demonstration of the physical and £££ impact of genetics
- Complete integration with research, knowledge exchange and education programmes across the supply chain

DELIVERY OF THE RECOMMENDATIONS



COMMERCIAL PROGENY TEST - EXAMPLE

Pool of Available AI Sires with range of EBVs –
maternal and terminal traits



Steer/young bulls



Heifers



Finishing

Growth
Scans/linear
Health
RFI*

Slaughter

Carcass
Meat quality
Value

Growth

Scans/linear
Age at puberty
Days to calving

Survival

Cow weight
Condition score
Fertility/health
Cull reason

COMMERCIAL PROGENY TEST - EXAMPLE



Objectives:

1. quantify the value of improved beef genetics on commercial beef farms
2. demonstrate how existing genetic and genomic tools can be used to improve profitability
3. develop new genetic tools based on data collected to enhance future beef farming profits

EXAMPLE FROM ANOTHER COUNTRY

Beef+Lamb New Zealand



880,000
beef calves

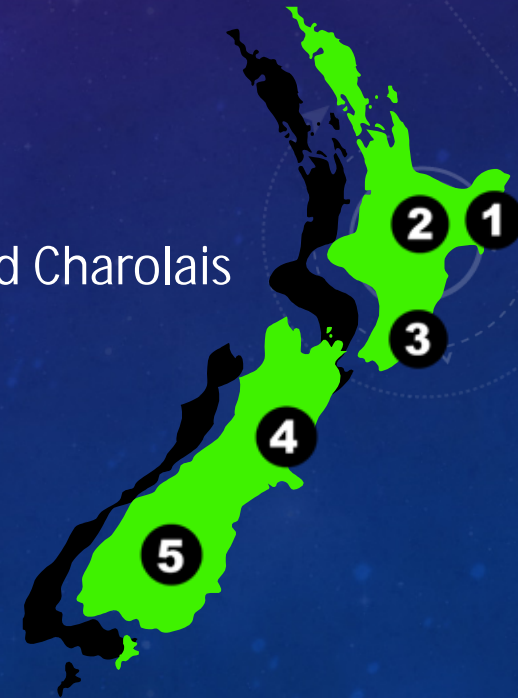


3,560,000
dairy calves

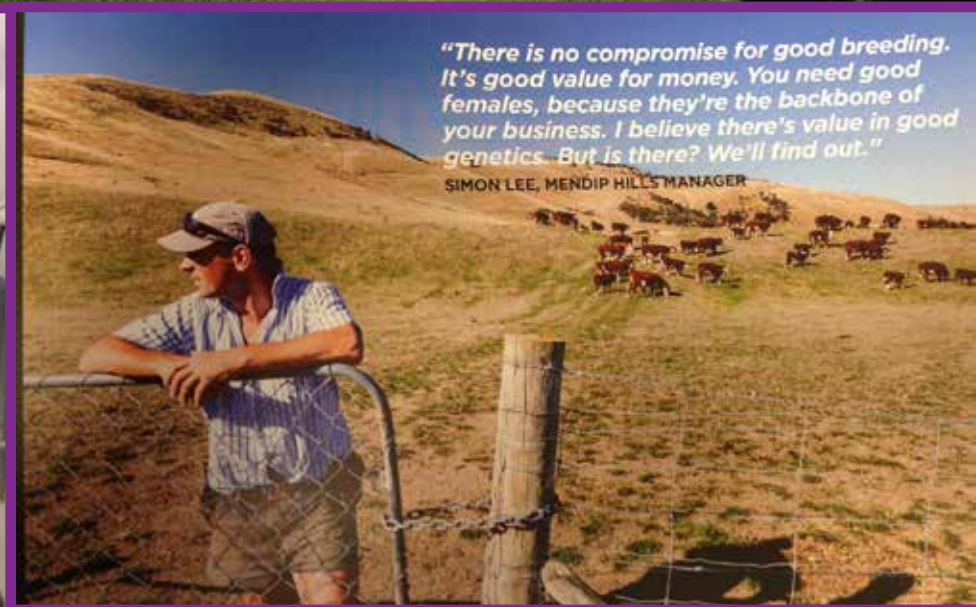
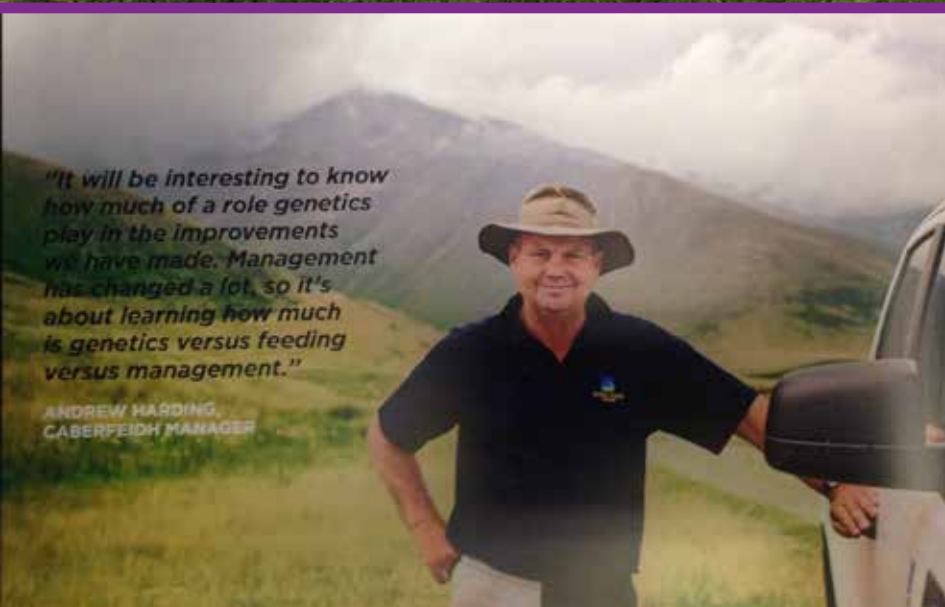


600,000
Beef x dairy calves

- 5 farms across North and South Islands
 - Range of farms
- Range of genetics: Angus, Hereford, Stabiliser, Simmental and Charolais
- Over 2500 cows and heifers inseminated
 - Performance recording underway
 - Maternal and Terminal goals



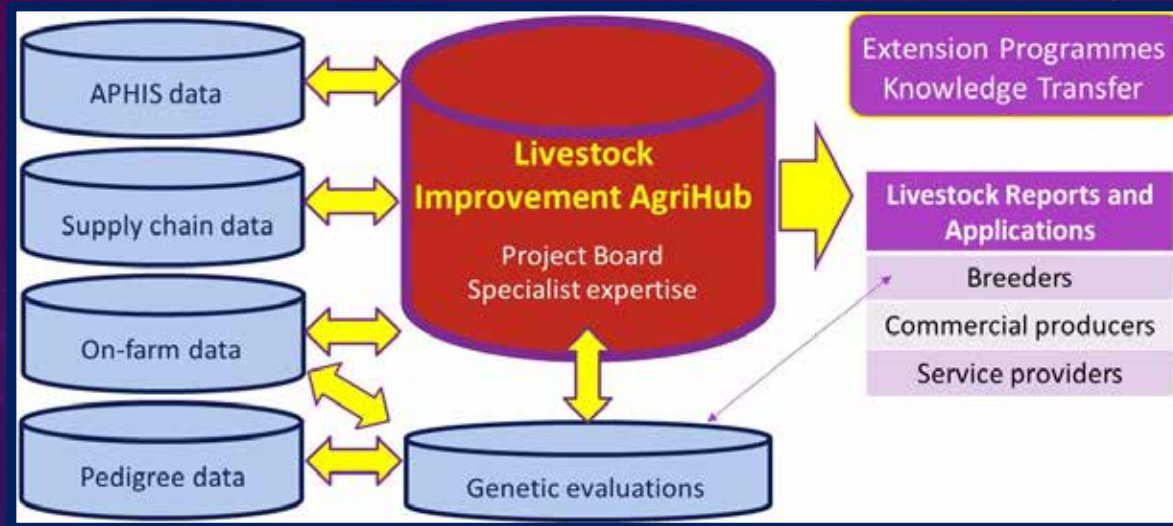




.....About learning how much is genetics versus feeding versus management

No compromise for good breeding. It's good value for money. You need good females, .. they're the backbone of your business.

INFORMATION TO INFORM DECISIONS



- Direct linkage between genetics and farm performance/sustainability indicators
- Real time dataflows to one access point
- Portal for data sharing throughout the supply chain
- Consistent message across the supply chain as based from the same data
- Minimal producer input of data - automated where possible

WHAT WILL THE HUB DELIVER?

Livestock Improvement AgriHub

Project Board
Specialist expertise

- Reconnection with commercial needs
- Tailored tools to inform decisions
- Increased rates of genetic gain
- New breeding goals

- Improved production efficiency
- Improved animal health
- Improved environmental credentials of beef farming
- Increased profitability and competitiveness

genetic and non genetic routes

WHAT IS IN IT FOR ME?

Farm type	Brief description	Cumulative increase in gross margin (10 years)
Suckler cow producer	100 cow herd birth to slaughter	+ £90,638
Beef finisher	150 head finished per year	+ £94,760

- Estimated benefits to the Northern Ireland beef industry £60M

AFSB VISION

- Reconnect a fragmented supply chain
- Shift to a data driven and better informed industry making the best decisions
– world leading
- Identify, access and use the best genetics locally and internationally
- Position Northern Ireland to capture the opportunities arising from genomics
- Improve animal health management and traceability
- **Competitive, profitable and exciting industry which is an attractive prospect of the next generation**

NI AgriHub

Driving improved livestock genetics,
health and competitiveness



Connecting and simplifying data
management



**Informed
Breeding**

**Informed
Management**

**Informed
Marketing**

**Improved
Product**

**Enhanced
Sustainability**