VistaMilk

A World Leading SFI Research Centre

Science Foundation Ireland sfi For what's next

"To address the unprecedented challenges that lie ahead, the food system needs to change more radically in the coming decades than ever before, including during the Industrial and Green revolutions".

(UK Food and Farming Foresight, 2011)

Donagh Berry

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HOST INSTITUTION

Teagasc Agriculture and Food Development Authority

PARTNER INSTITUTIONS

DCU, UCD Dublin, NUI Galway Oé Gaillimh, Tyndall National Institute, TSSG, Waterford Institute of Technology, ICBF.com, UCC University College Cork, Ireland Coláiste na hOllscoile Corcaigh, Insight

FUNDED BY:

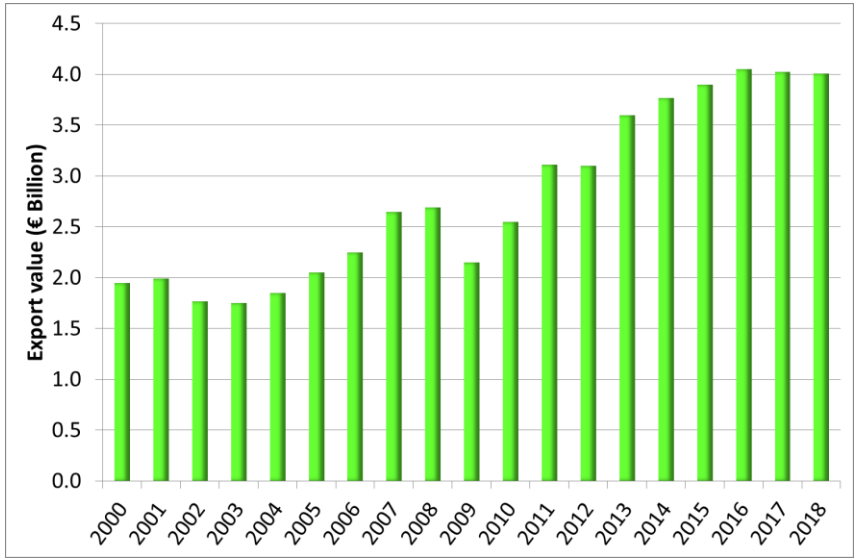
An Roinn Talmhaíochta, Bia agus Mara Department of Agriculture, Food and the Marine

Ireland's European Structural and Investment Funds Programmes 2014-2020 Co-funded by the Irish Government and the European Union

European Union European Regional Development Fund

Science Foundation Ireland sfi For what's next

Business Case for agriculture



Employment:

Agri-Food: 173,000

ICT: 105,000

Exports:

Agri-Food: €13.6b

ICT: €72b

10th

largest dairy exporter

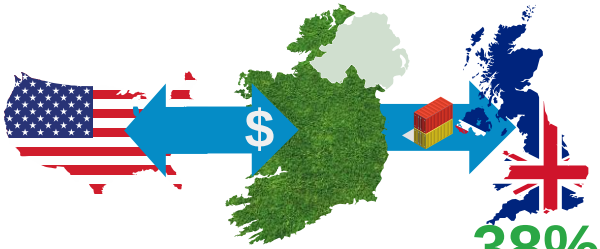
2nd

largest ICT exporter

KERRY glanbia

Top ten indigenous Irish companies

The Big **Challenges**



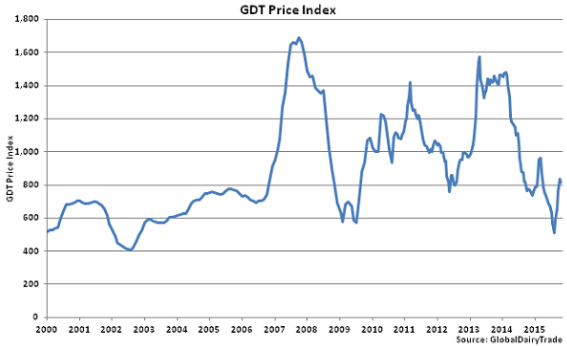
38%

Food & Drink Exports

Reduce emissions by

30% by 2030

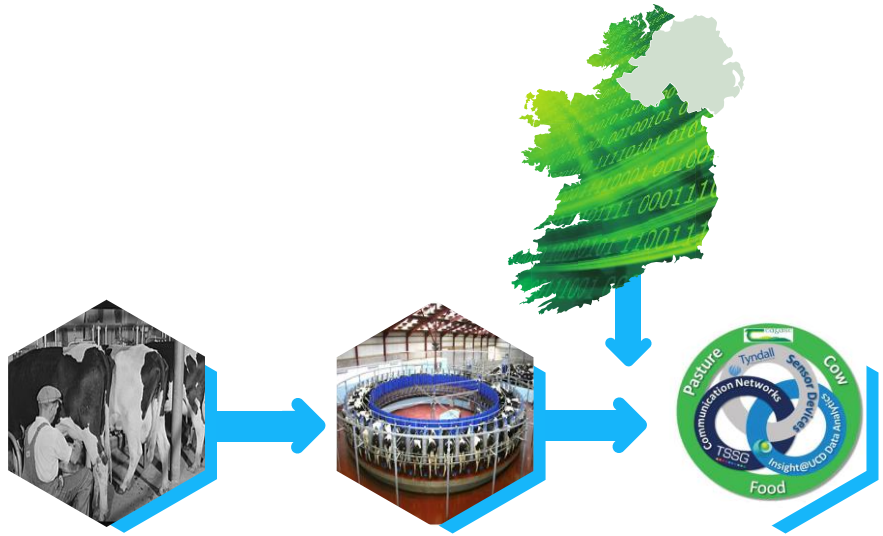
PARIS2015
UN CLIMATE CHANGE CONFERENCE
COP21·CMP11



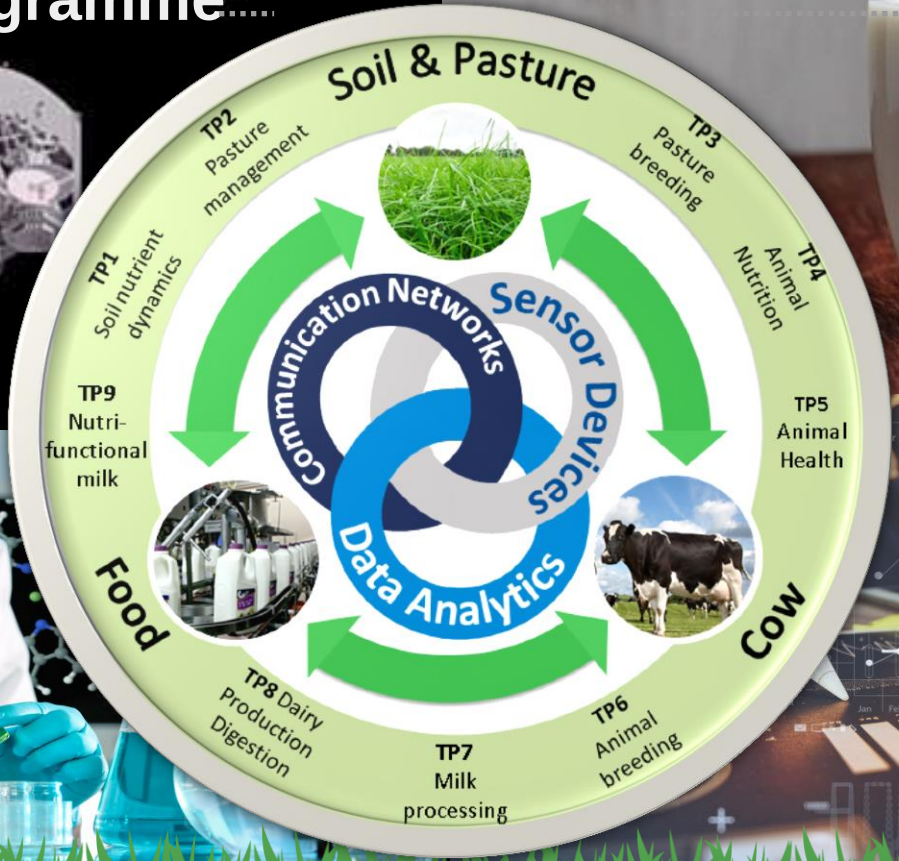
Vision

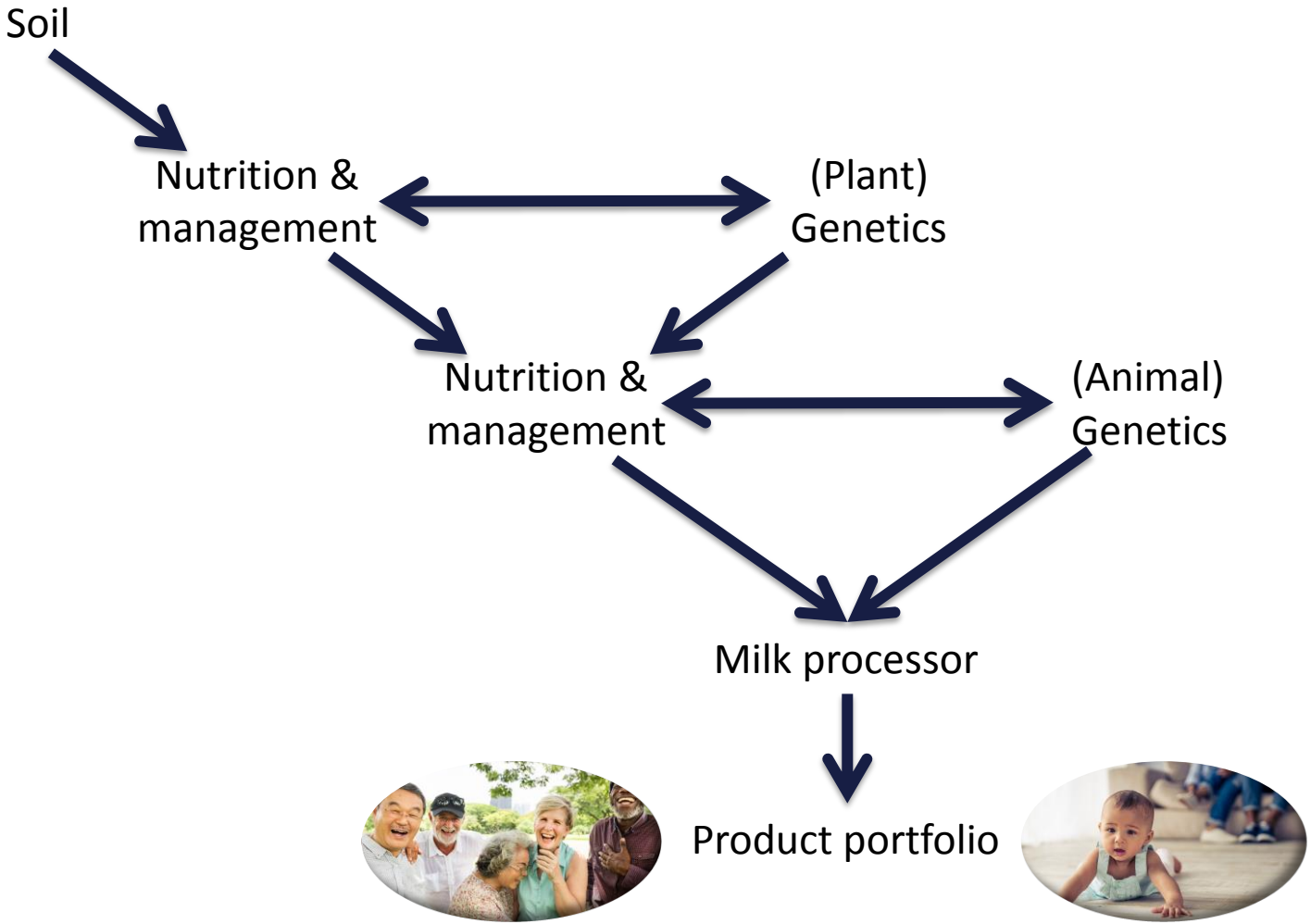
Agent of sustainable growth for the Irish dairy and Agri-Tech industry by being a world leader in fundamental and translational research for precision pasture-based dairying.

- **Surge in sustainable competitiveness**
- **Cement and build academic-industry relationships**
- **Address societal challenges**
- **Create a new Agri-Tech industry populated with highly trained staff**



Research **Programme**




Soil
Nutrition & management
(Plant) Genetics
Nutrition & management
(Animal) Genetics
Milk processor
Product portfolio

(Animal)
Genetics

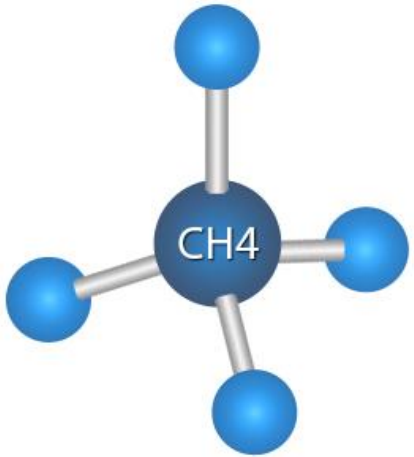
Milk processor

Product portfolio

Soil

Nutrition & management

(Plant) Genetics



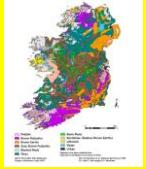
Nutrition & management

(Animal) Genetics

Milk processor

Product portfolio

Where pasture meets animal



Problem statement

Sensing

Comms

Analytics

Predictions

Interpretation

DST

PastureBase IRELAND

NMP Online

MET éireann

Soil & pasture

Cow

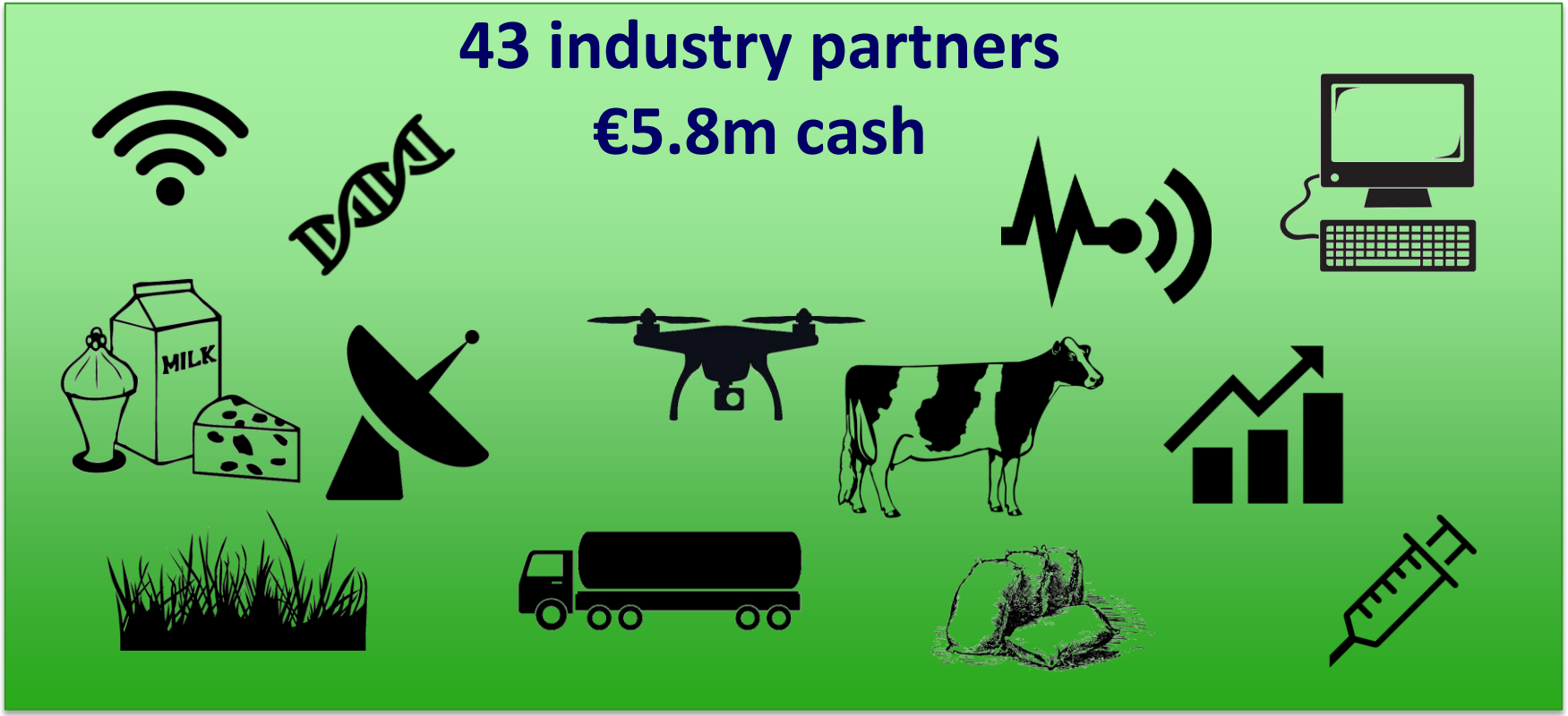
Food

ICBF.com

HerdPlus

Profit through Science

Industry involvement



Business model(s)

Users

- Farmers
- Milk processors
- Service providers
- Regulators
- Others?
- **Deployment strategies**

Justifications

- Better decision making
- Increased efficiency and profitability
- License to sell
- Unique selling point

Models of use

- Disposable / permanent / modular
- Farmer owned
- Leasing
- **Warranty based**
- Service providers
- “Enforced”

Beneficiaries

- Rural communities
- Consumers
- Society as a whole
- Upstream and downstream industries
- New markets

OUTPUT

IMPACT

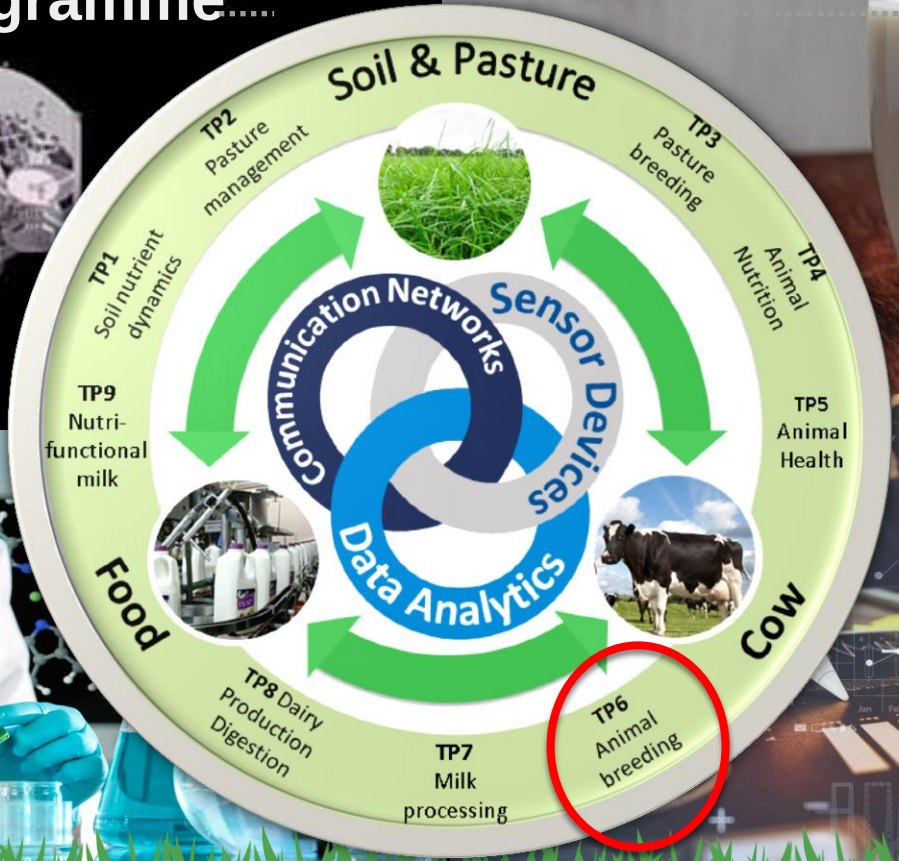
Human capital

IP

Companies

Scientific papers

Research **Programme**....

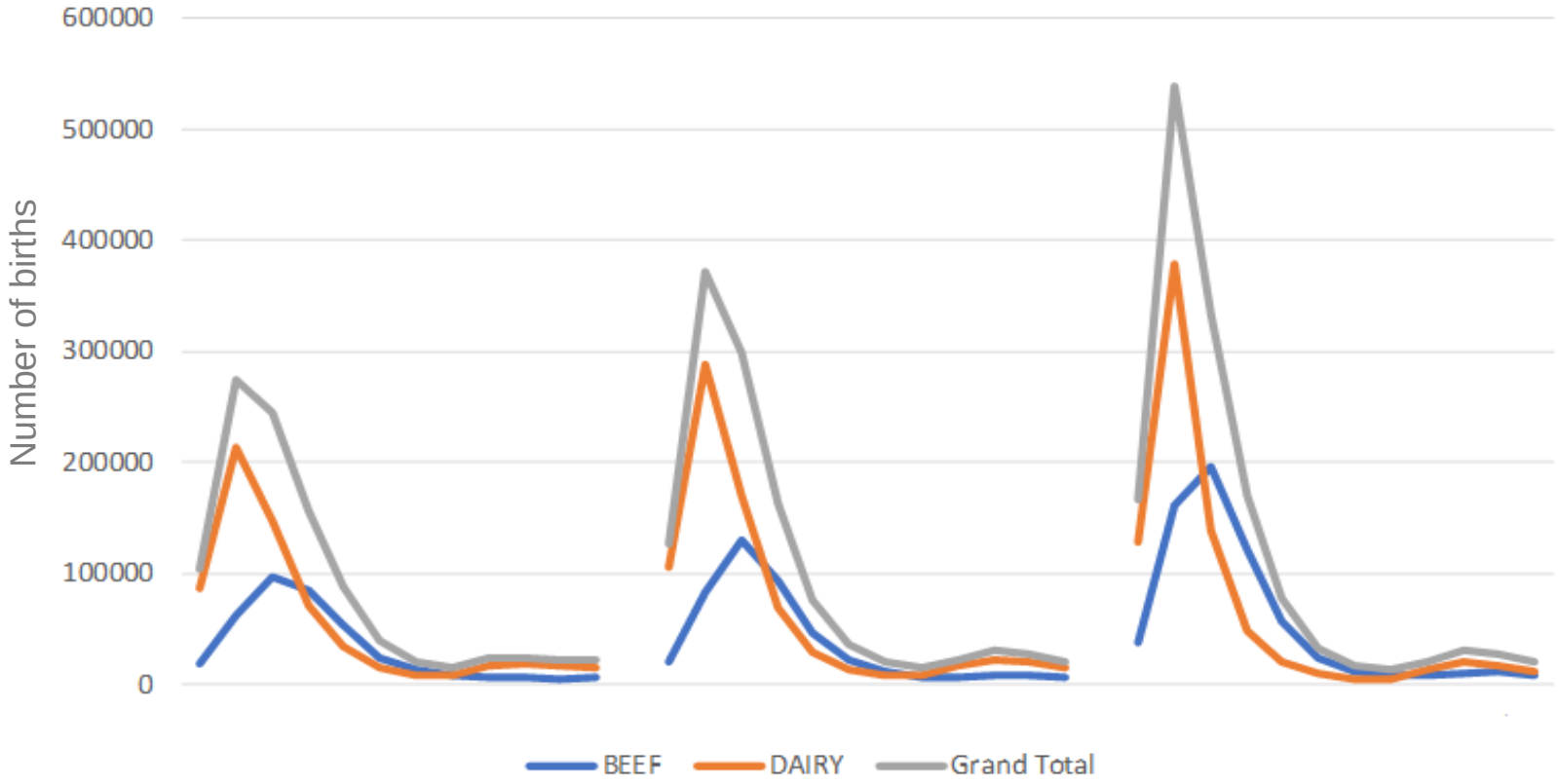


Circular (bio)economy

Creates a closed-loop pattern in the economy, which effectively reduces the release of waste material into the environment

A key component is thinking about ‘waste’ in a different way, not as something to be discarded but as something to be re-purposed.

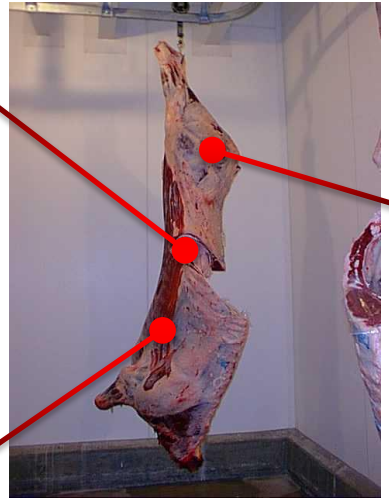
What's the problem?



The *"Goldilocks"* problem

Carcass weight	
Too light	Too heavy
Steak too small	Excessive trimming
Poor dilution	
Poor return	Economic/environmental cost

Carcass fat	
Too lean	Too fat
Not appealing	Excessive trimming (labour)
Poor return	Economic/environmental cost

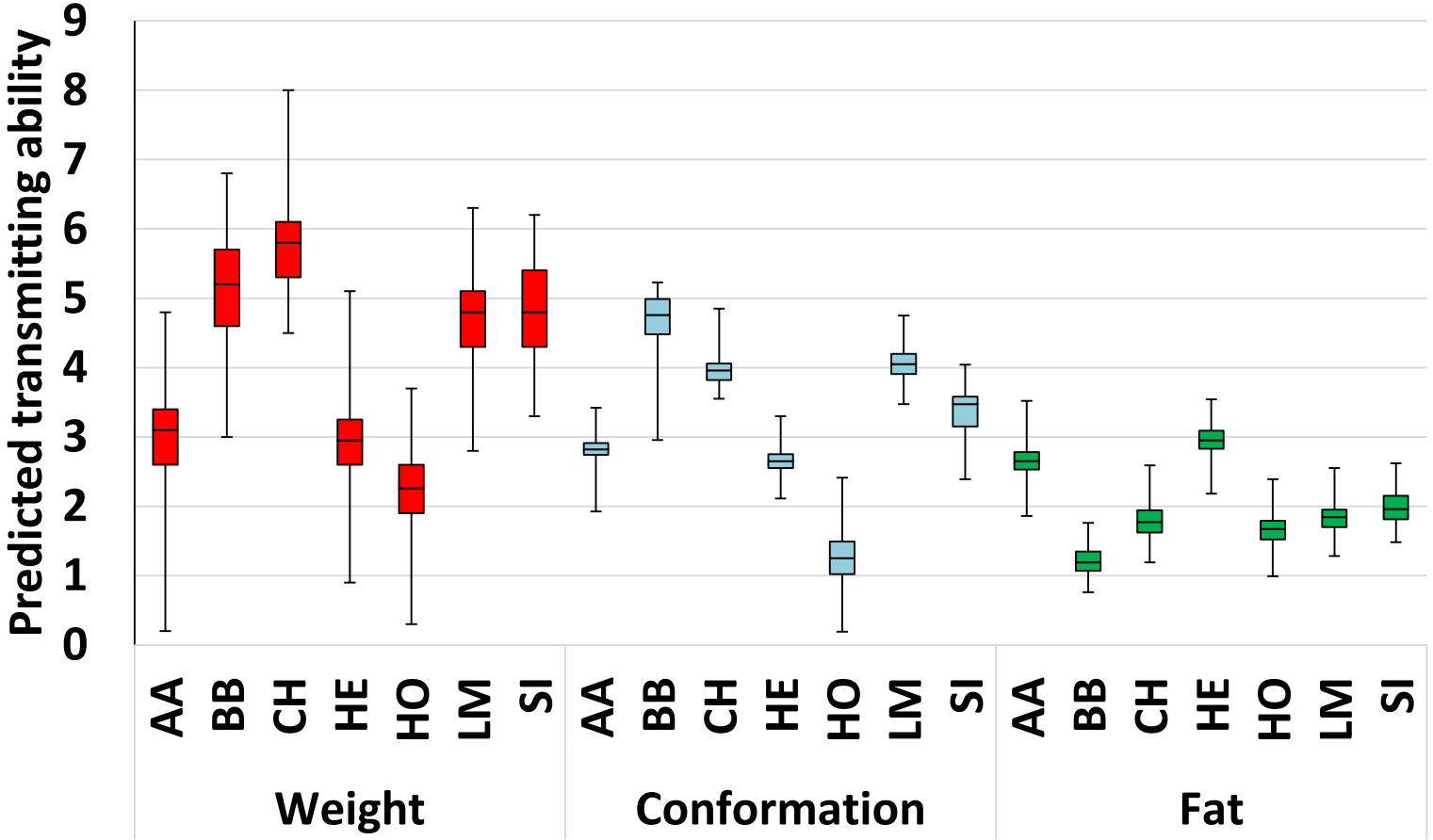


Poor carcass conformation
Poor yield of high value cuts
Poor return

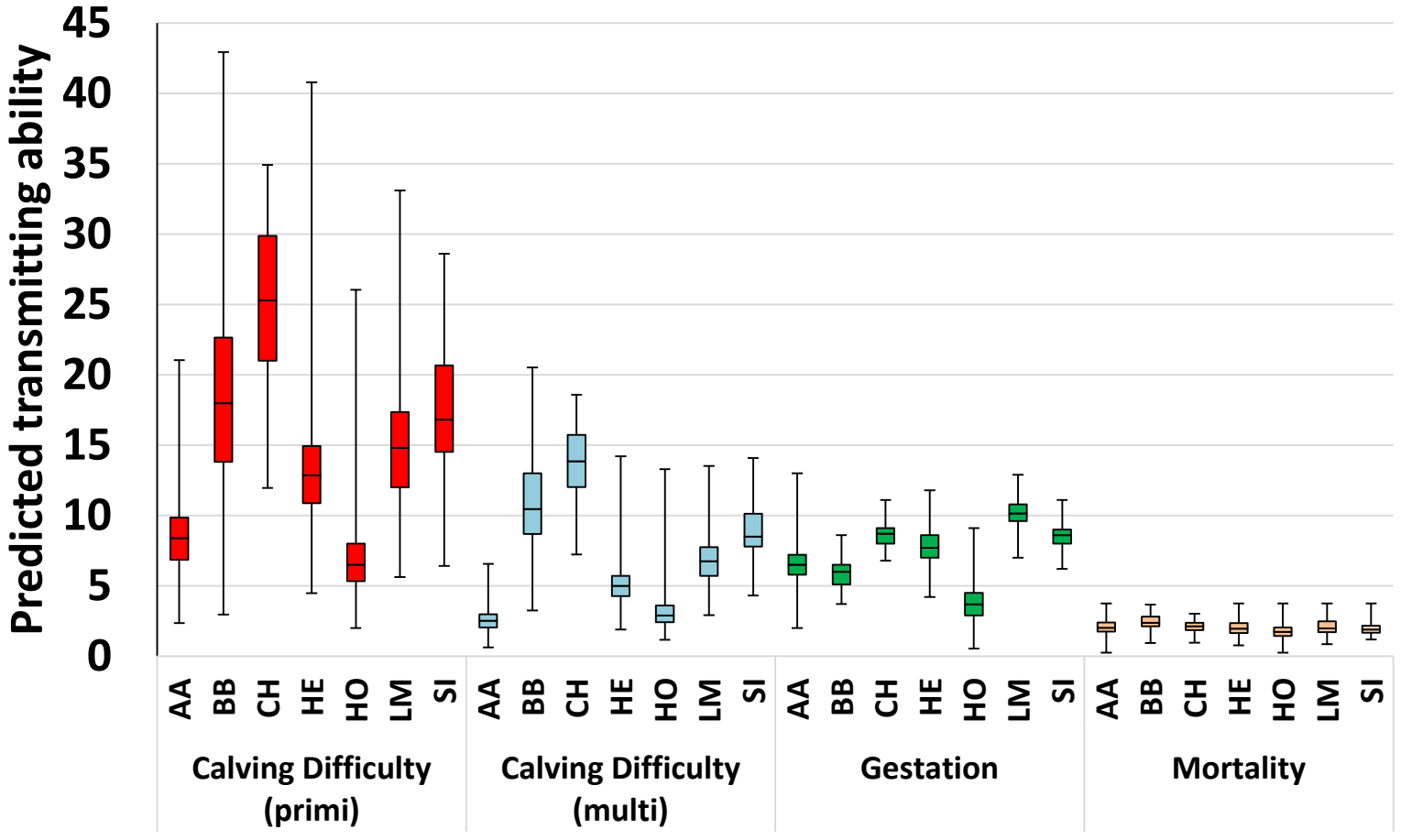
Carcass metrics (dairy dams)

Breed	N bulls	Carcass wt	% <280 kg	Carcass conf	% <O=
LM	25	334	10%	7.0	1%
BB	29	351	8%	7.8	2%
AA	35	295	32%	5.6	12%
HE	31	316	27%	5.5	17%
NR	10	307	29%	4.2	62%
FR	117	309	26%	4.5	51%
HO	509	303	31%	3.6	74%
JE	50	255	66%	3.3	84%

Within-breed variability (carcass)



Within-breed variability (calving)



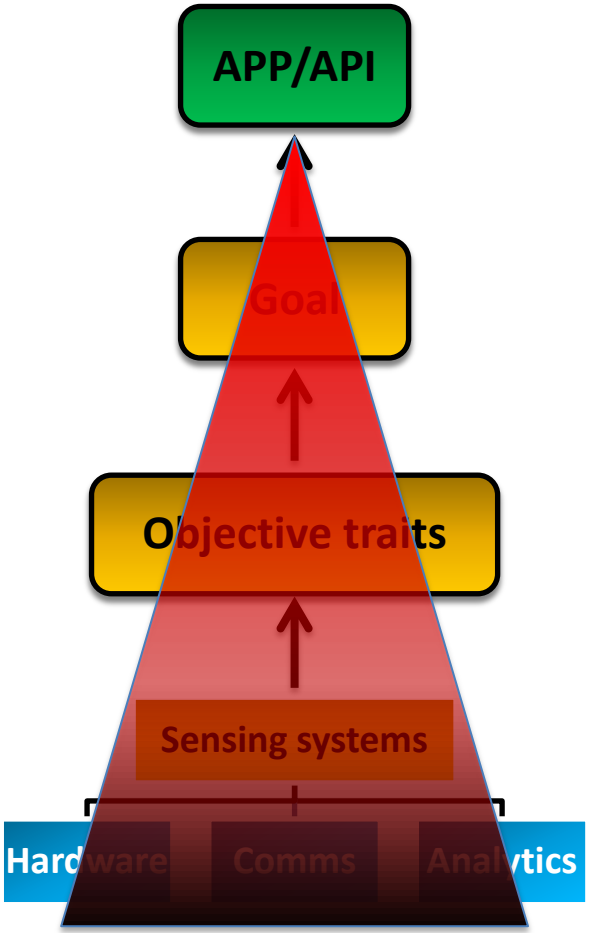
Indexes

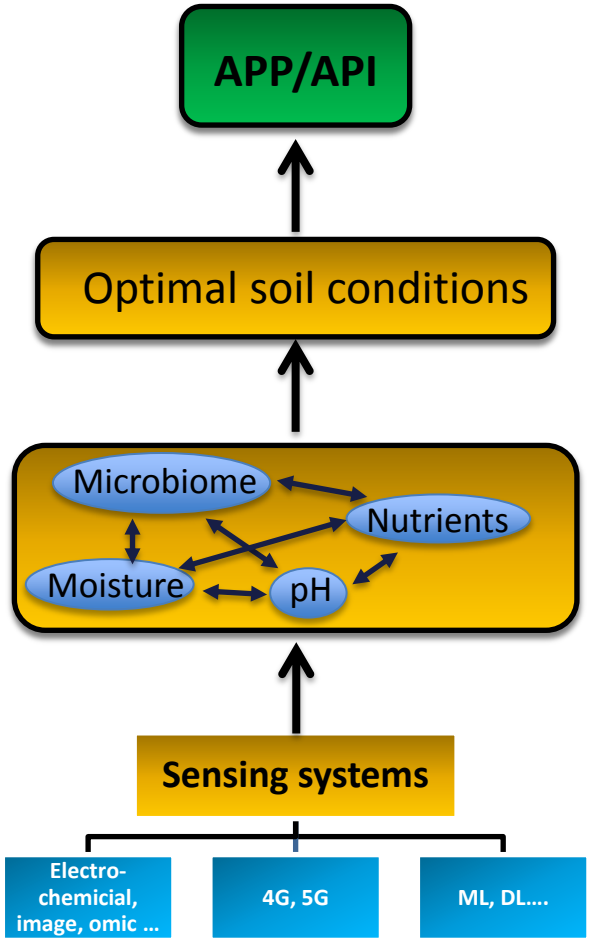
Optimal deployment strategy and business model

What is the purpose?

What traits constitute this and what is their relative importance?

How can these measures be generated?





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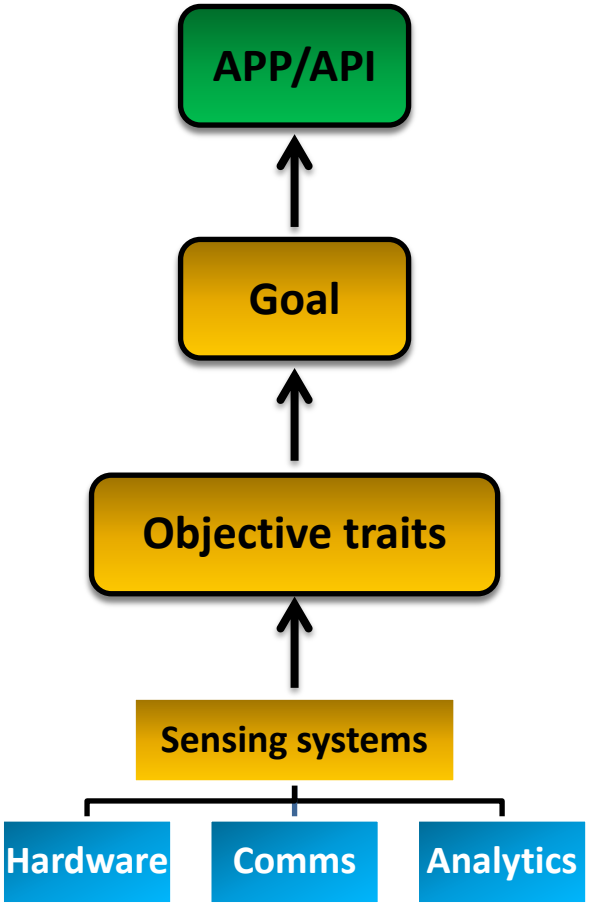
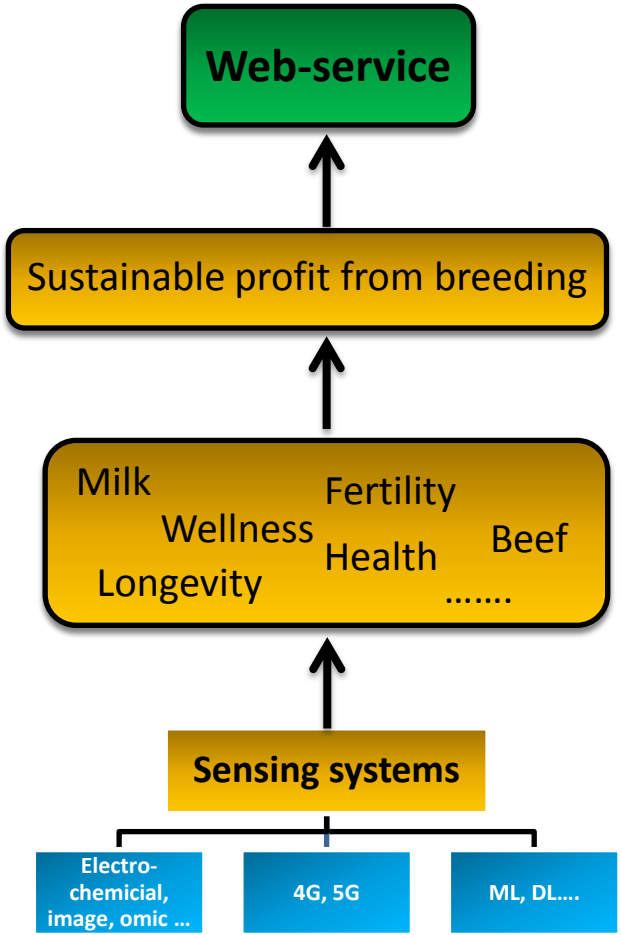
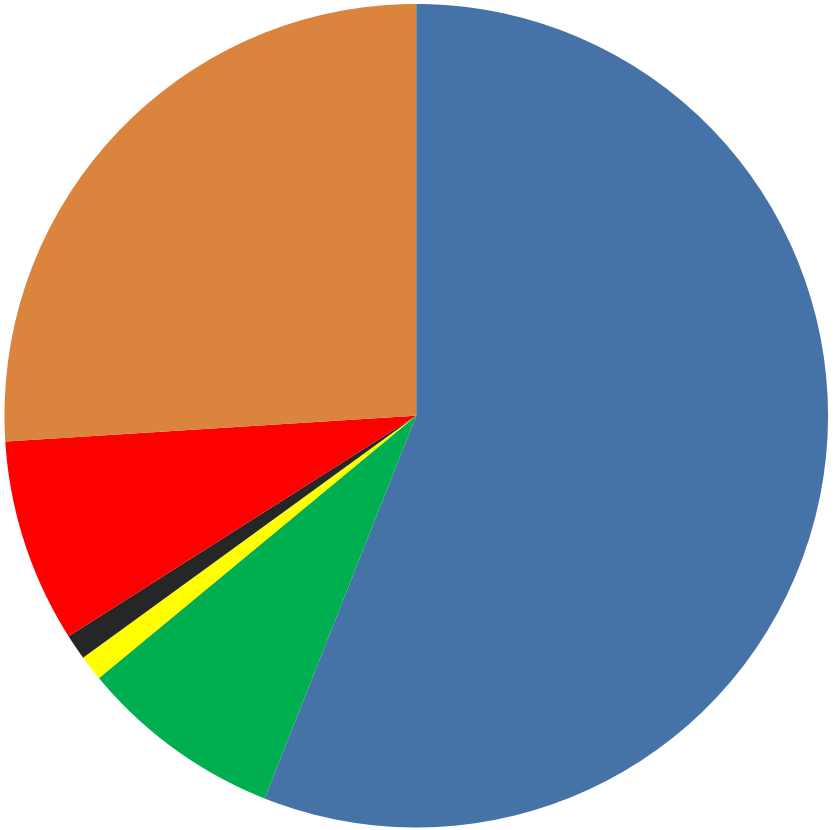




Dairy-Beef index



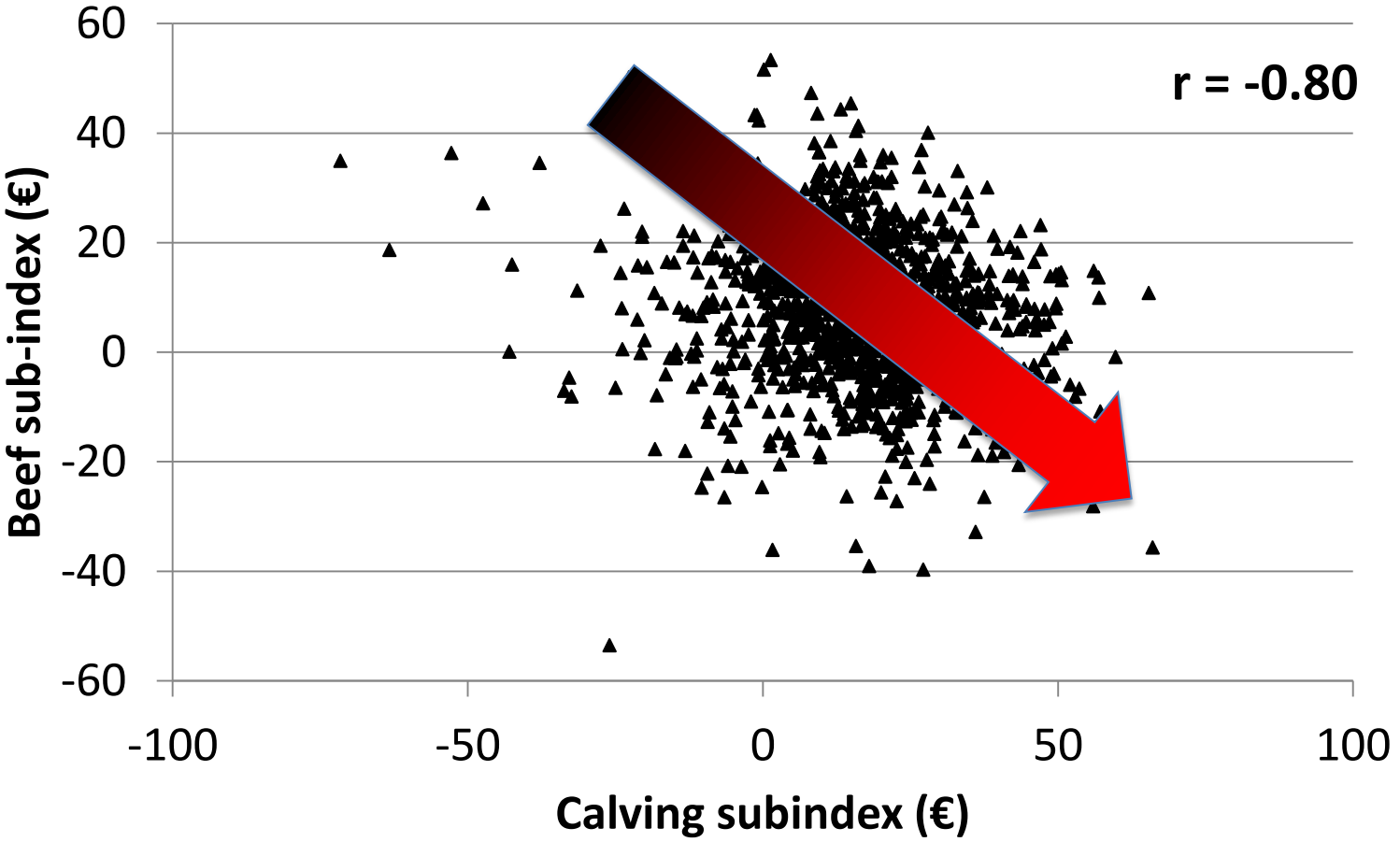
- Calving difficulty (56%)
- Gestation length (8%)
- Calf mortality (1%)
- Docility (1%)
- Feed intake (8%)
- Carcass (26%)

J. Dairy Sci. 102:10056–10072
https://doi.org/10.3168/jds.2019-16912

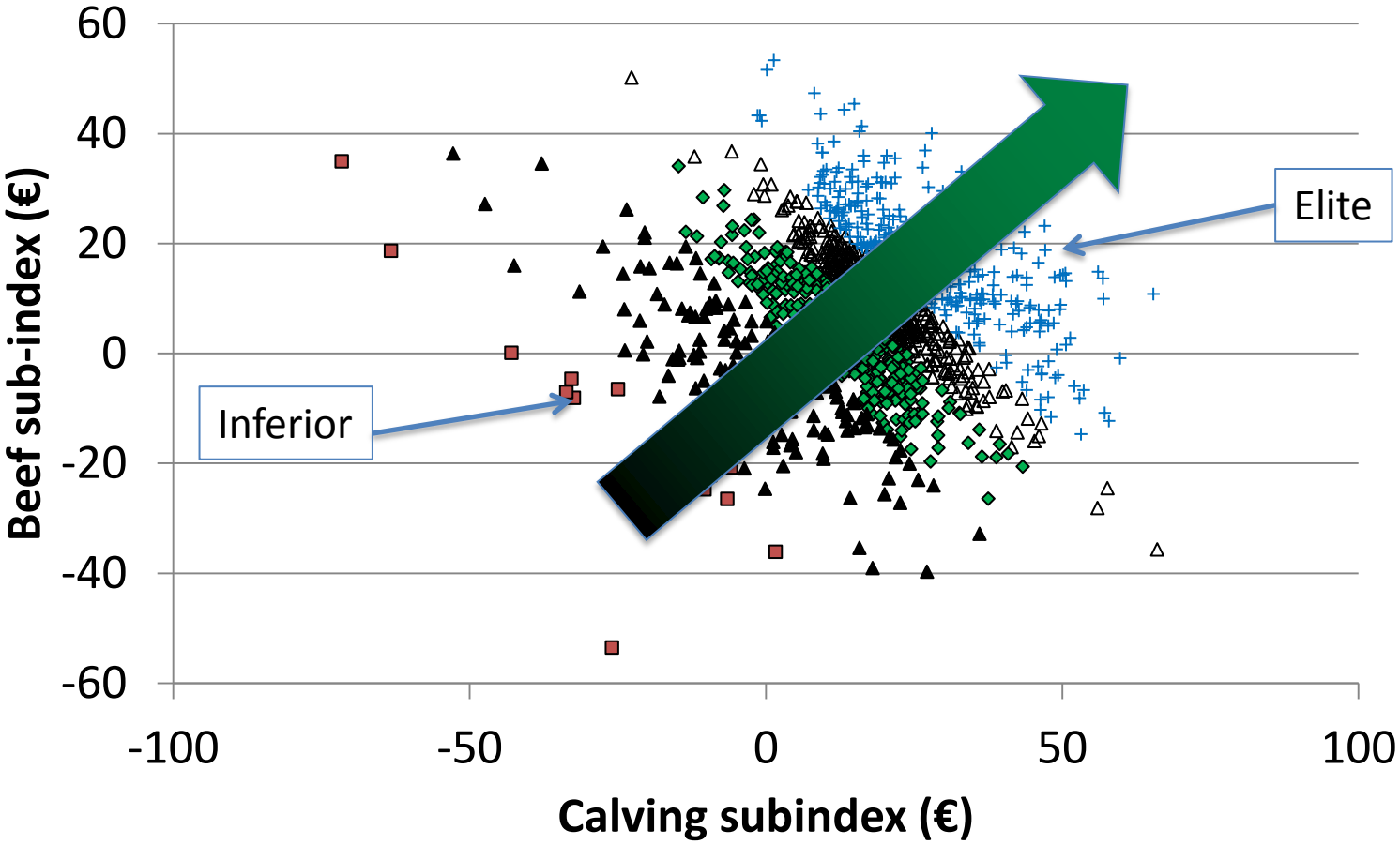
A breeding index to rank beef bulls for use on dairy females to maximize profit

D. P. Berry,[1]* P. R. Amer,[2] R. D. Evans,[3] T. Byrne,[2] A. R. Cromie,[3] and F. Hely[2]
[1]Teagasc, Animal and Grassland Research and Innovation Centre, Moorepark, Fermoy P61 P302, Co. Cork, Ireland
[2]AbacusBio Ltd., Dunedin 9016, New Zealand
[3]Irish Cattle Breeding Federation, Highfield House, Shinagh, Bandon P72 X050, Co. Cork, Ireland

What the index is trying to do



What the index is trying to do



Dairy-beef index v status quo

Index	Calv diff (%)	Gest (d)	Calf mort (%)	Carc weight (kg)	Carc conf (1-15)	Carcass fat (1-15)	DMI (kg)	% not reaching conf thres	% not reaching weight thres
Status quo	**0.01** (0.27)	**-2.5** (0.53)	**-0.26** (0.55)	**-3.4** (8.57)	**0.62** (0.21)	**-0.18** (0.18)	**0.03** (0.09)	**21** (6)	**10** (5)
Dairy-Beef index	**3.4** (1.42)	**-0.02** (1.63)	**-0.15** (0.56)	**24.1** (6.45)	**2.14** (0.56)	**-0.33** (0.36)	**-0.39** (0.33)	**9** (4)	**2** (1)

Dairy-beef index – Launched 21st Jan 2019

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Dairy Beef Index
BREEDING HIGH QUALITY BEEF CATTLE FROM THE DAIRY HERD
ICBF.com

The Dairy Beef Index (DBI) is a breeding goal for Irish dairy and beef farmers to promote high quality beef cattle bred fro
at slaughter yet, they have minimal consequences on the calving difficulty or gestation length of the dairy cow.

Dairy Beef Bull Lists (September 2019)

- Dairy Beef Index Active AI Bull List (>100 calvings in dairy herds) – Sept 2019
- Dairy Beef Index ALL AI Bulls (>30 Calvings in dairy herds) – Sept 2019

ICBF.com Irish Cattle Breeding Federation

Animal Details

AI Code:	LRH	Breed:	AA (100%)	Pedigree Status:	PED
Animal Name:	LAHEENS RICHARD	Owner:	NATIONAL CATTLE BREEDING CNTR	Sire:	HILLSGROVE CHAMPION / HGC
Sex:	MALE	Date of Birth:	05-MAR-1999	Dam:	LAHEENS BEDDY / IWDB4
National ID:	IE231362560085	Date of Evaluation:	Sep 2019 (VALID UNTIL 21-NOV-19)	MGS:	CREGGA VINCENT / CRV
International ID:	AANGBRM000019991770				

Genotype included in evaluation

€uro-star Index | Replacement Graphics | Terminal Graphics | Linear Type | TB And Liver Fluke | Pedigree | Evaluation History | Index Comparison

Star Rating (within Angus breed)	Economic Indexes	€uro value	Index reliability	Star Rating (across all beef breeds)
★★★★★	Replacement (per daughter lactation)	€131	97% (V High)	★★★★★
★☆☆☆☆	Terminal	€42	92% (V High)	★☆☆☆☆
★★☆☆☆	Dairy Beef	€45	95% (V High)	★★★★★


2859
2828
2828

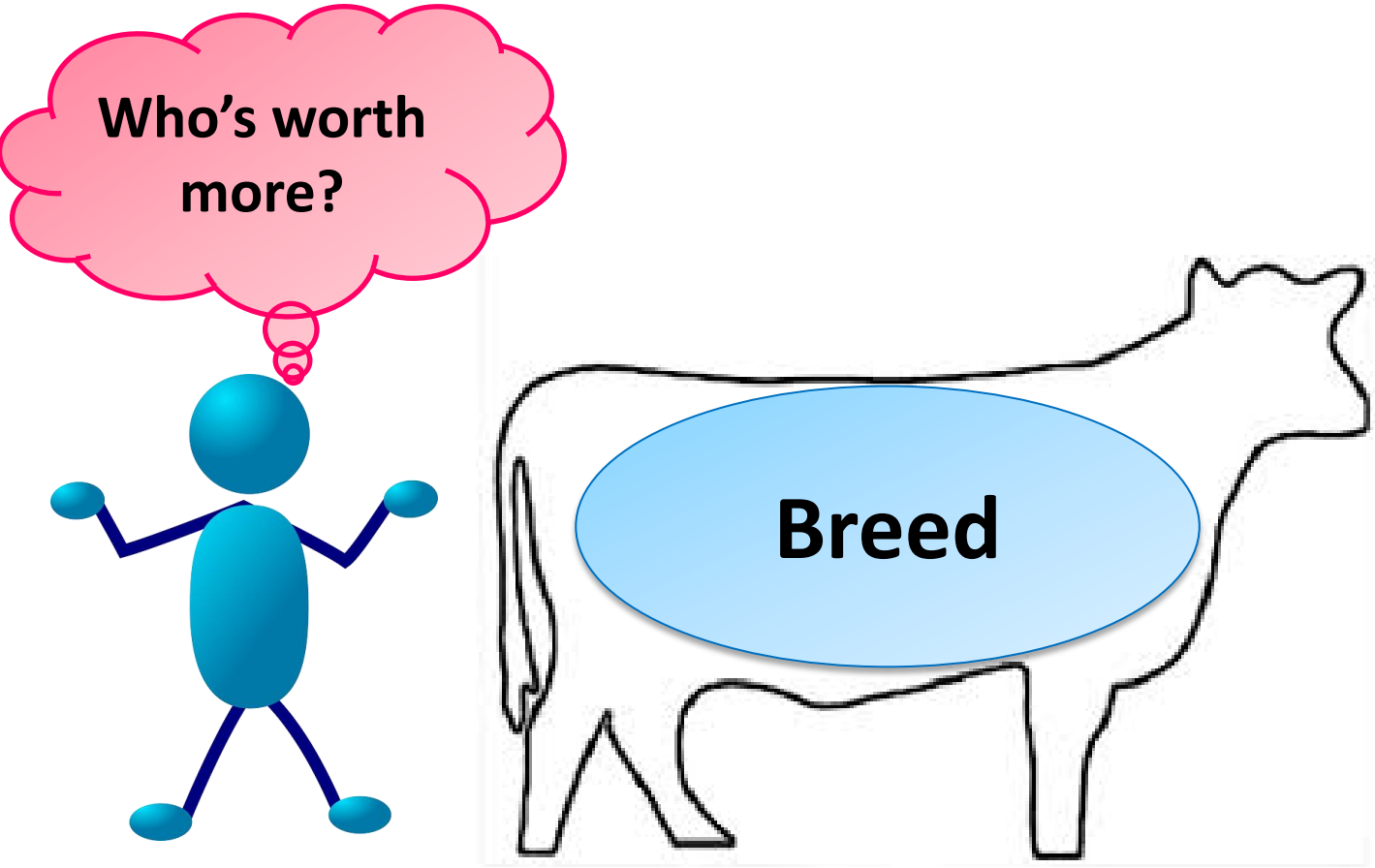
Breeding index → sale index

Trait	Economic Wt. €
Calving Difficulty	-4.65
Gestation	-2.25
Mortality	-5.34
Docility	17.03
Feed Intake	-38.63
Carcass weight	3.14
Carcass Conformation	14.77
Carcass Fat	-7.86

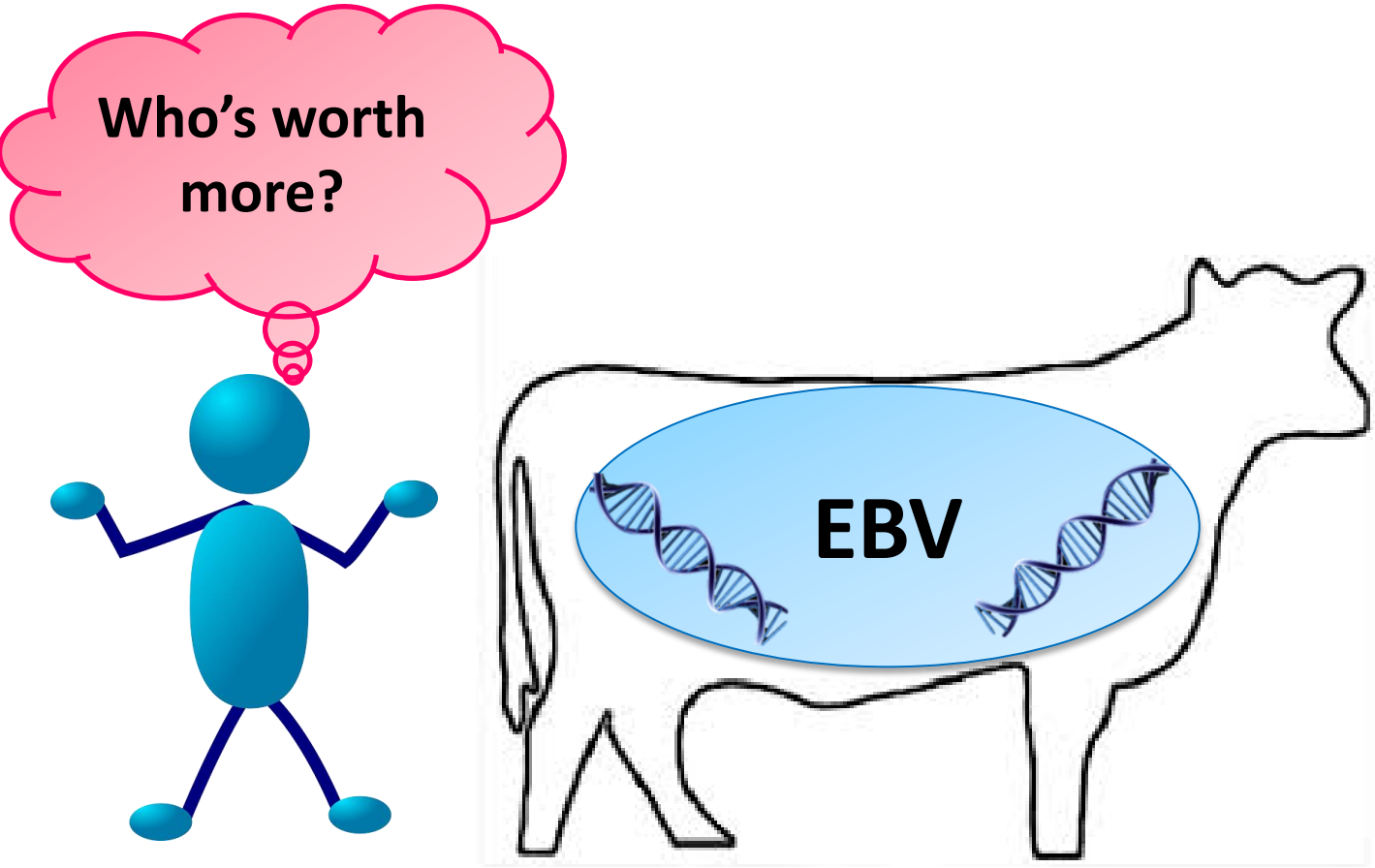
Calf index

Harvest index

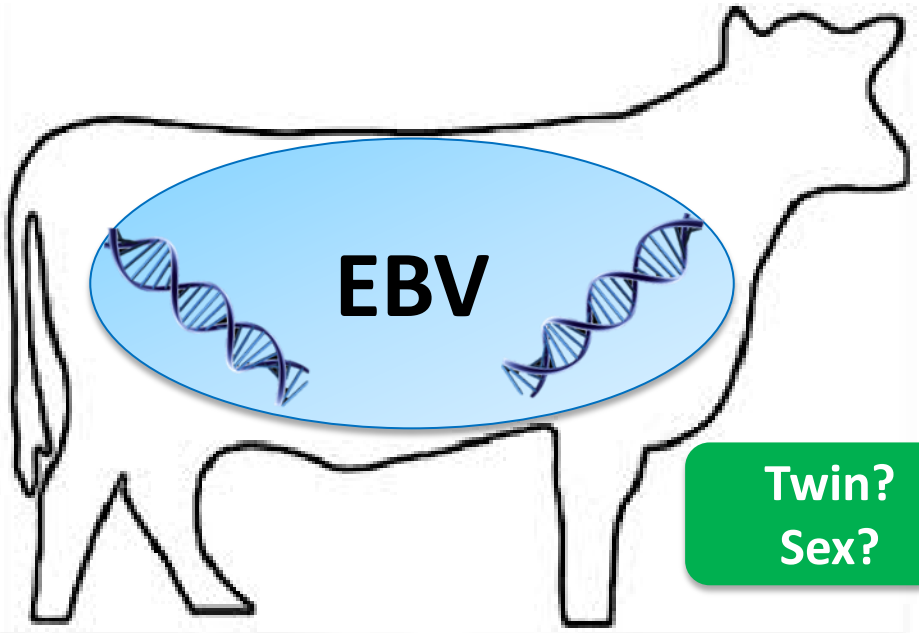
Index components



Index components



Index components



Age
Parity
Breed

Formulation of a decision support tool incorporating both genetic and non-genetic effects to rank young growing cattle on expected market value[1]

F.L. Dunne*[1], R. D. Evans[2], M.M. Kelleher[2], S.W. Walsh[1] and D. P. Berry*[1]

Index components

Who's worth more?

Heterosis

X

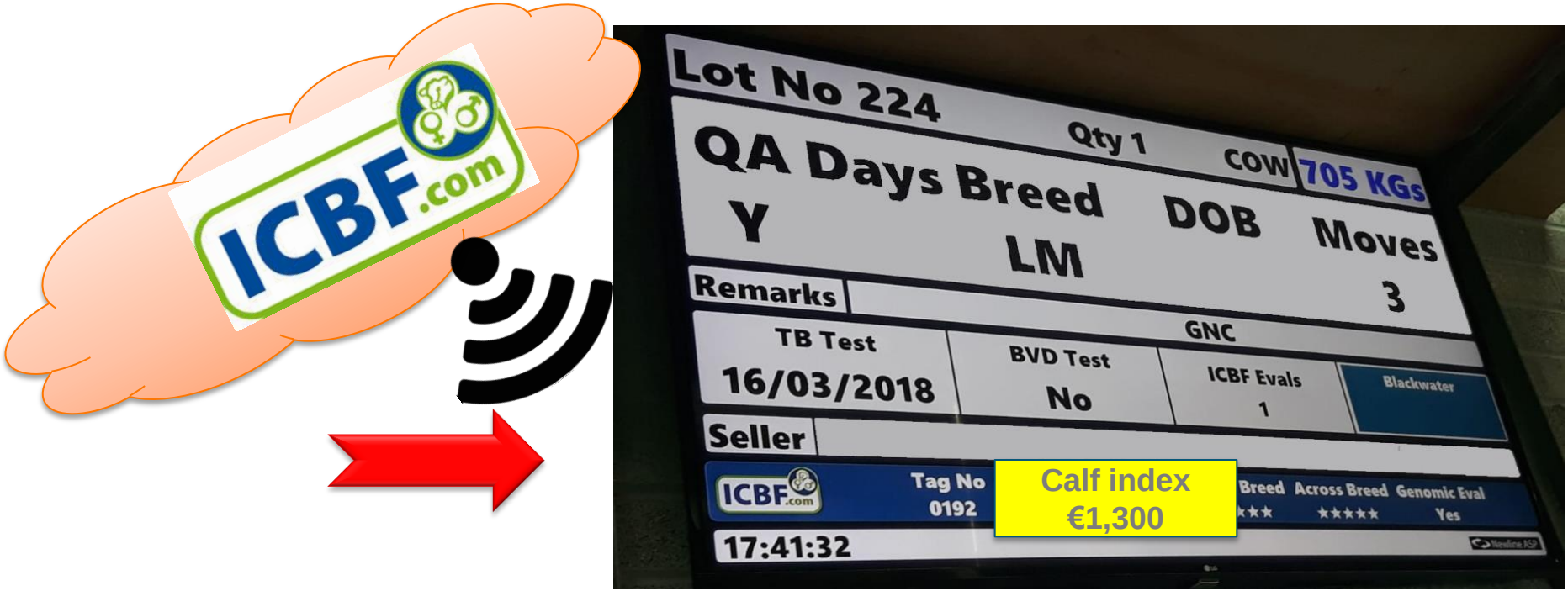
33%-66% more accurate

EBV

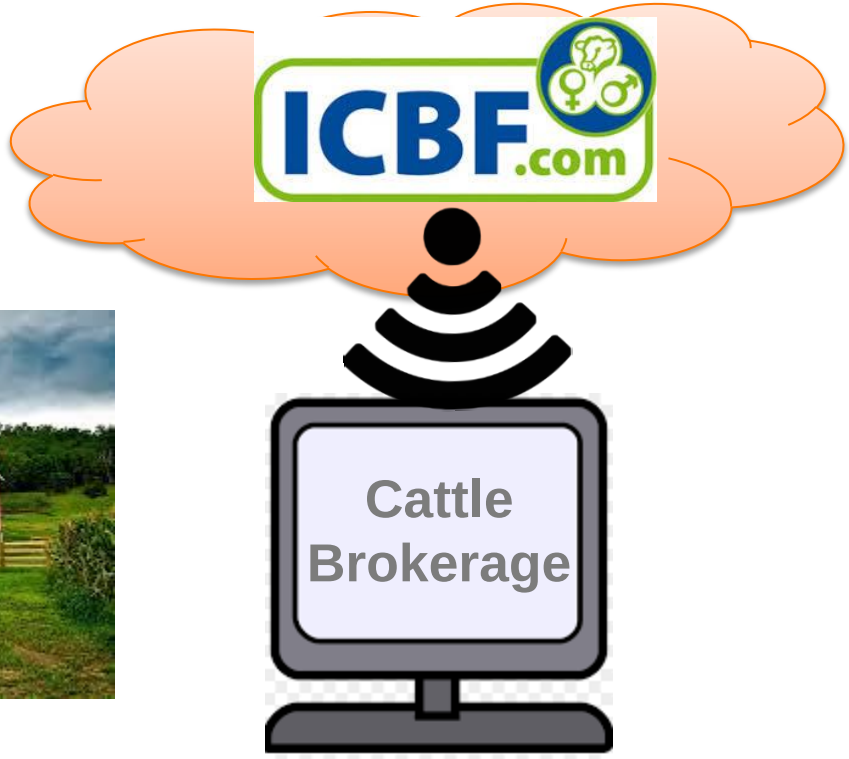
Twin?
Sex?

Age
Parity
Breed

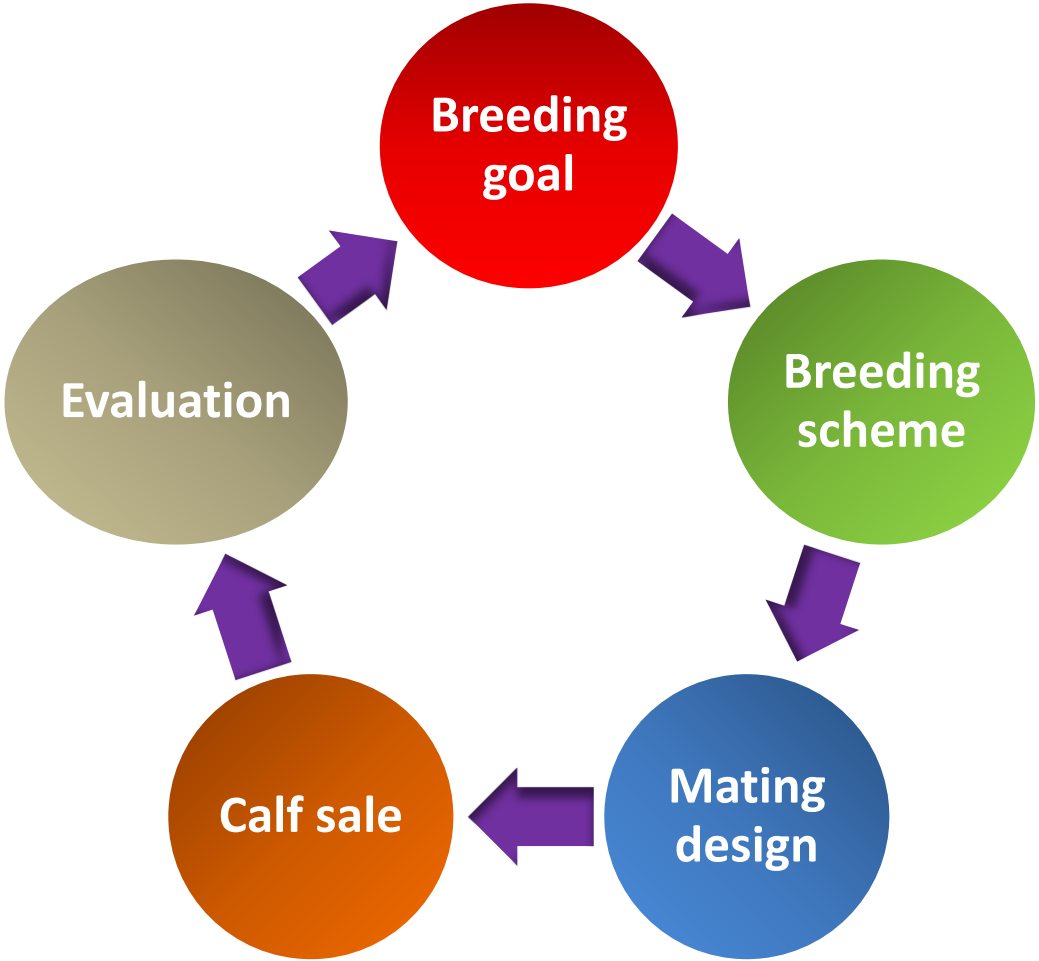
Application of Indexes



Application of Indexes



Circular take home message




Scientific excellence
Visionary
Industry focused
Building capabilities
Cohesive
Leaders
Co-creative Co-productive
Innovative
Soil & Pasture
Cow
Food
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