Dairy genetic improvement program design – a national approach

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Outcome of this talk

Outline why it is essential to have a genetic improvement program strategy

Provide an example of what good looks like – Irish industry

Outline

The power of genetics

What is a genetic improvement strategy for?

Building the foundation

What can genomics offer

What sort of value can be created

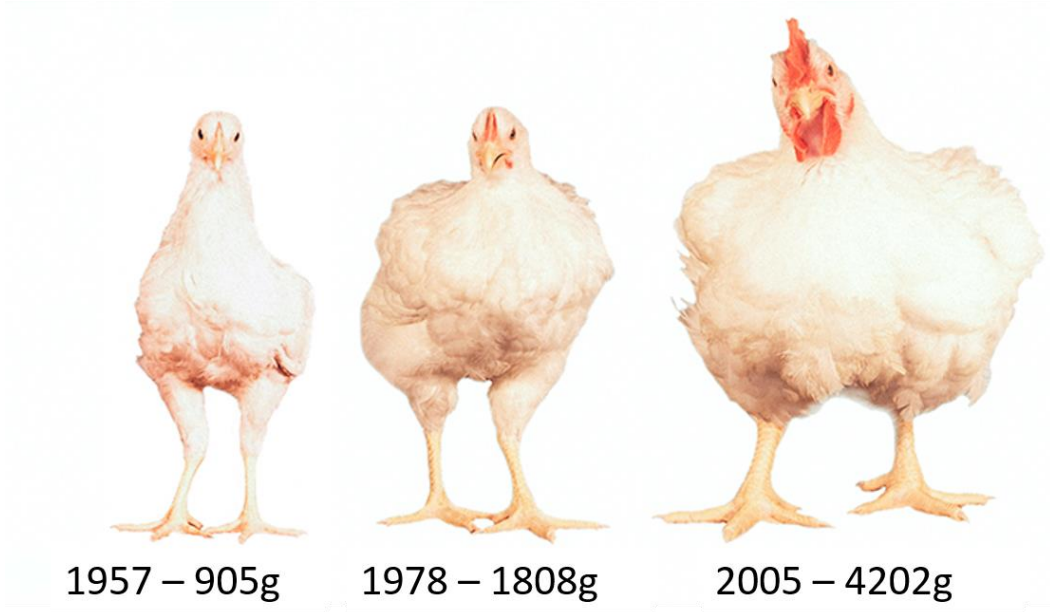
The power of genetics

Leverages population performance variation/ diversity and selection

Target multiple economic and environmental (or other) traits at a time

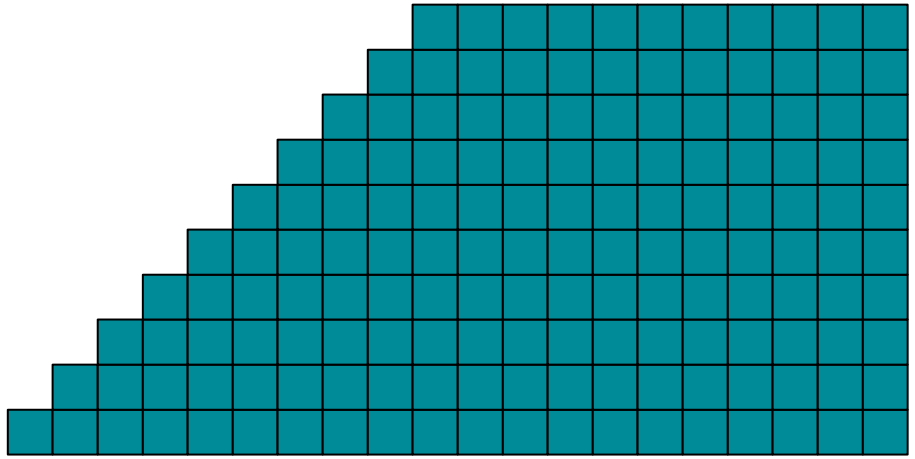
Genomic technology has increased the speed & value

A tool to deliver food production, profit, and support progress towards net zero

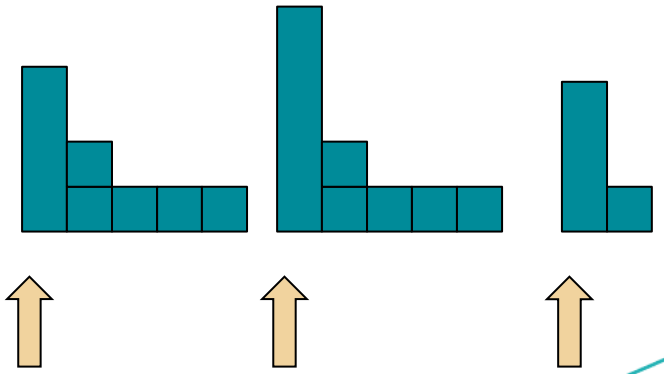


The power of genetics

Genetic Improvement



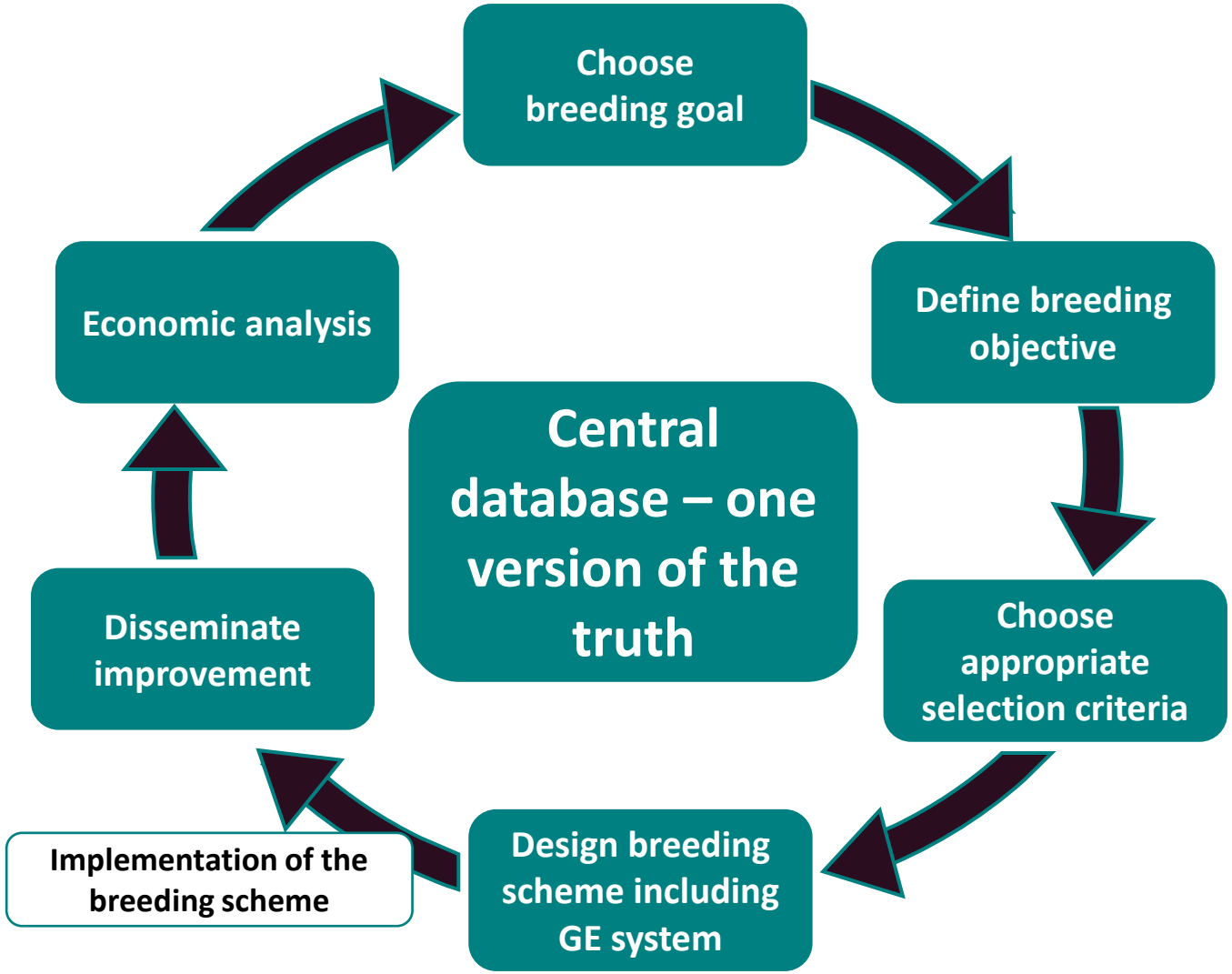
Fertiliser



What is a genetic improvement strategy for?

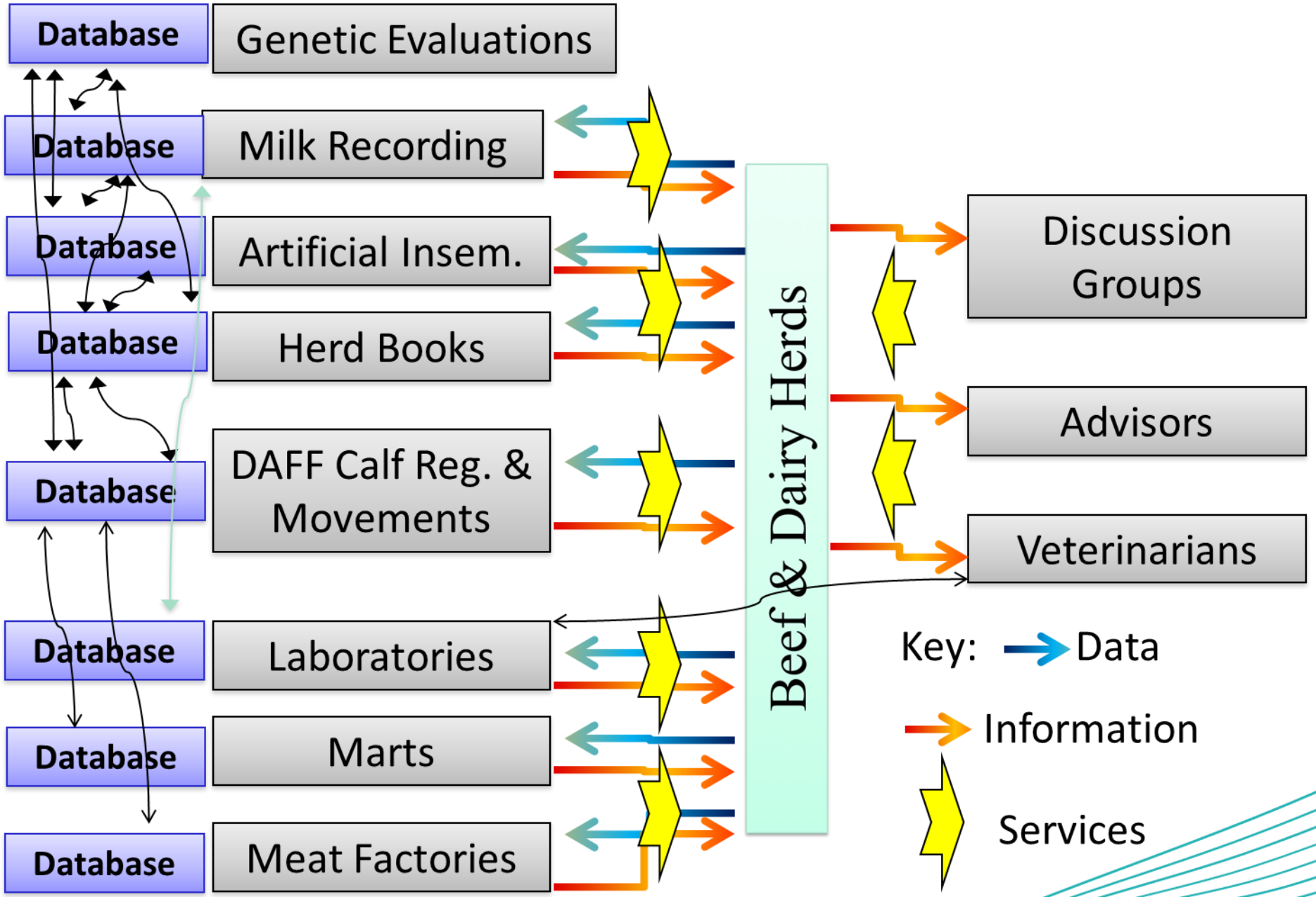
To set the long-term direction:

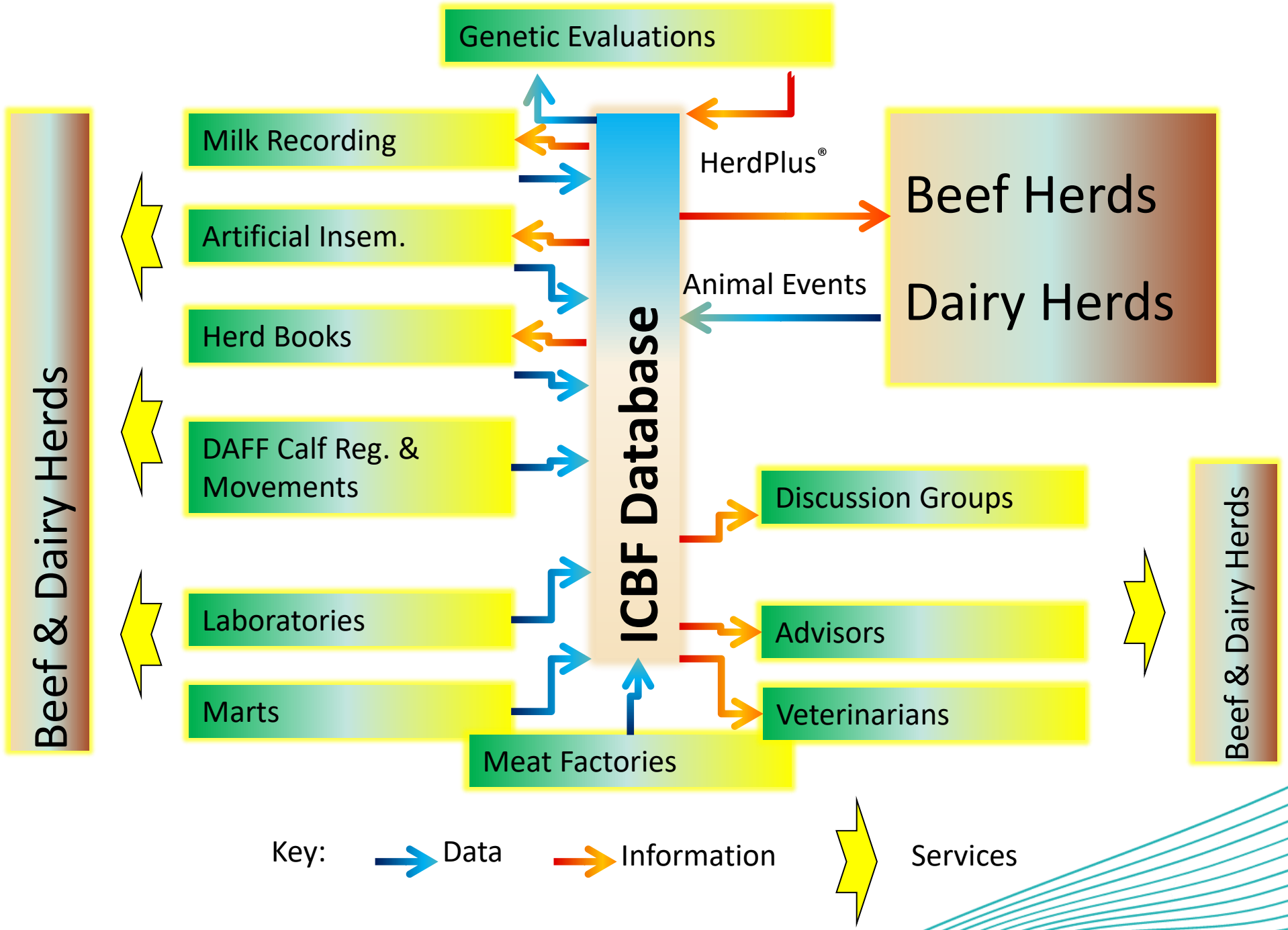
- Database and data infrastructure
- Stakeholder engagement
- What traits have value
- What/ when/ how to record
- Genetic/ genomic evaluation
- How to identify elite animals (breeding scheme)
- Roll out planning/ budgeting



By the textbook

A greenfield opportunity to build


Database
Genetic Evaluations
Database
Milk Recording
Database
Artificial Insem.
Database
Herd Books
Database
DAFF Calf Reg. & Movements
Database
Laboratories
Database
Marts
Database
Meat Factories
Beef & Dairy Herds
Discussion Groups
Advisors
Veterinarians
Key:
Data
Information
Services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HerdPlus®
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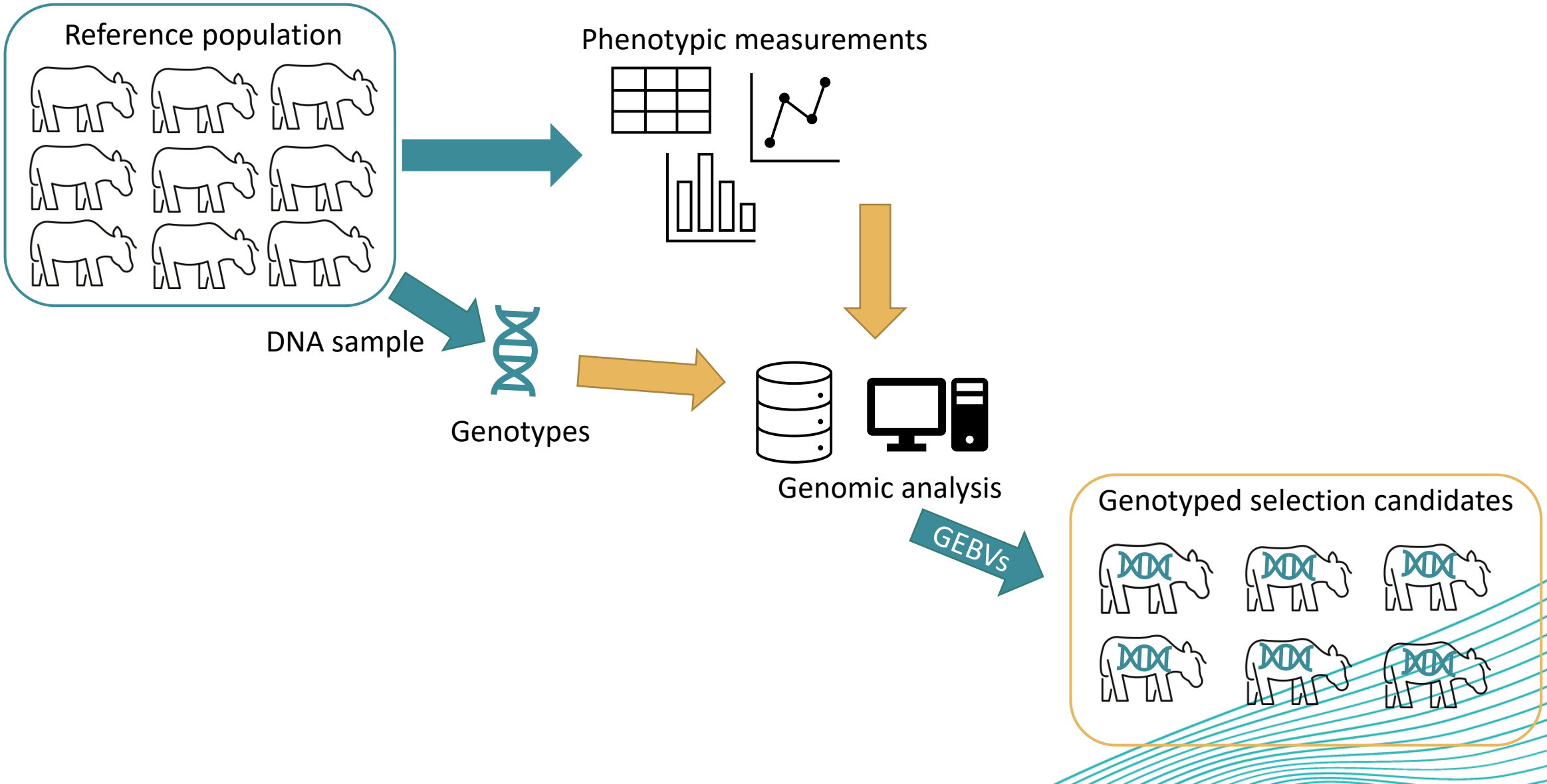
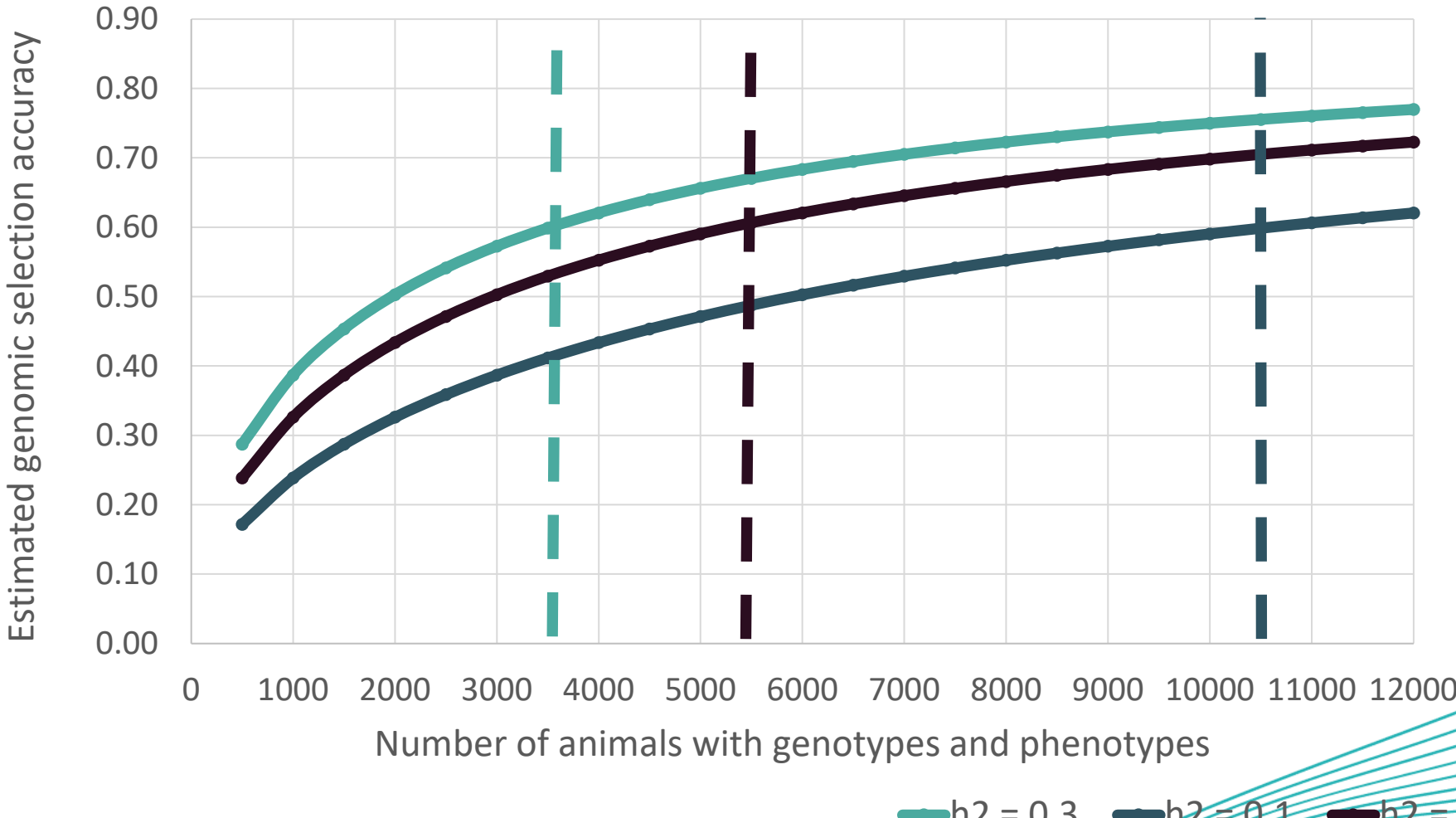
Breeding scheme – genomics

Genomic selection



Genomics – phenotypes are needed



The value from genomics – Irish industry example

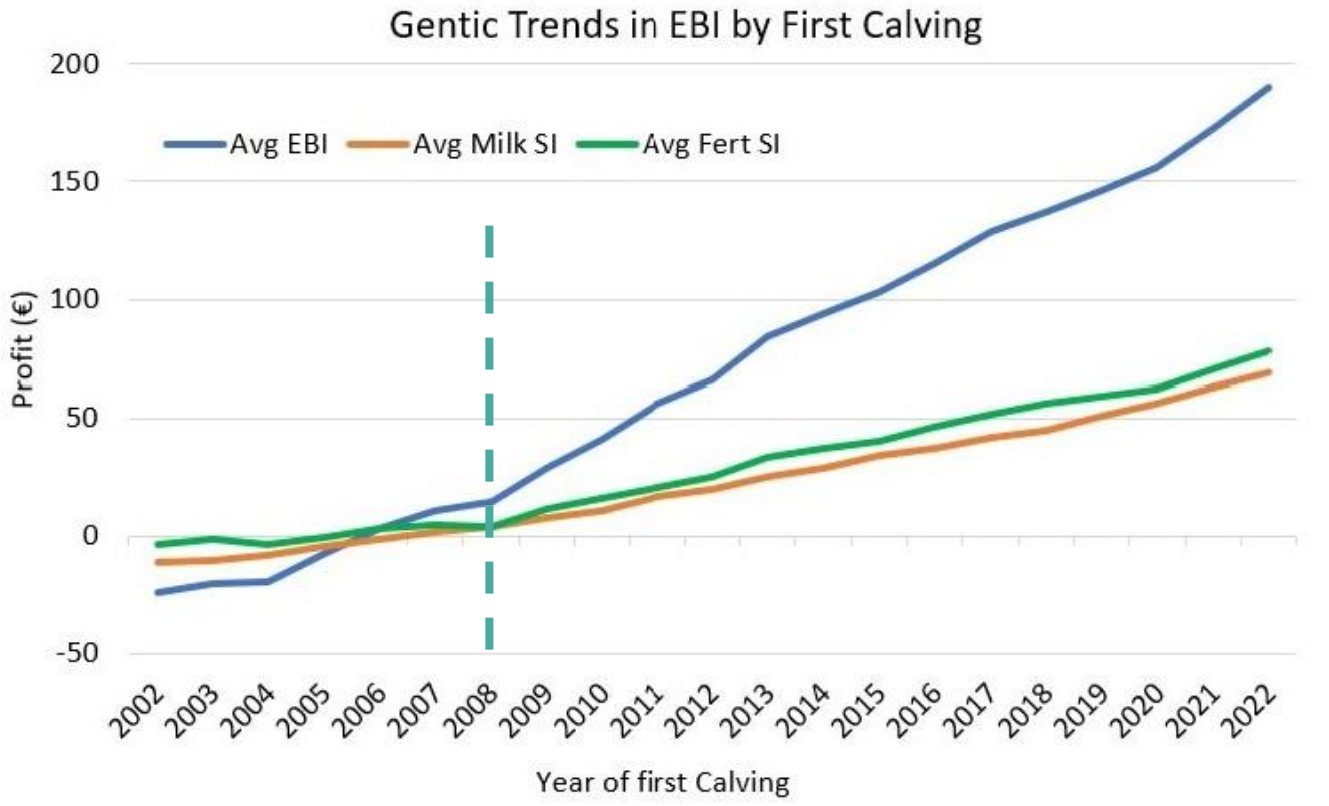
Non-genomic era 2002 – 2008

US$8.5/ cow/ year

Genomic era 2009 – 2022

US$13/ cow/ year

50% increase in profit



What sort of value can be created

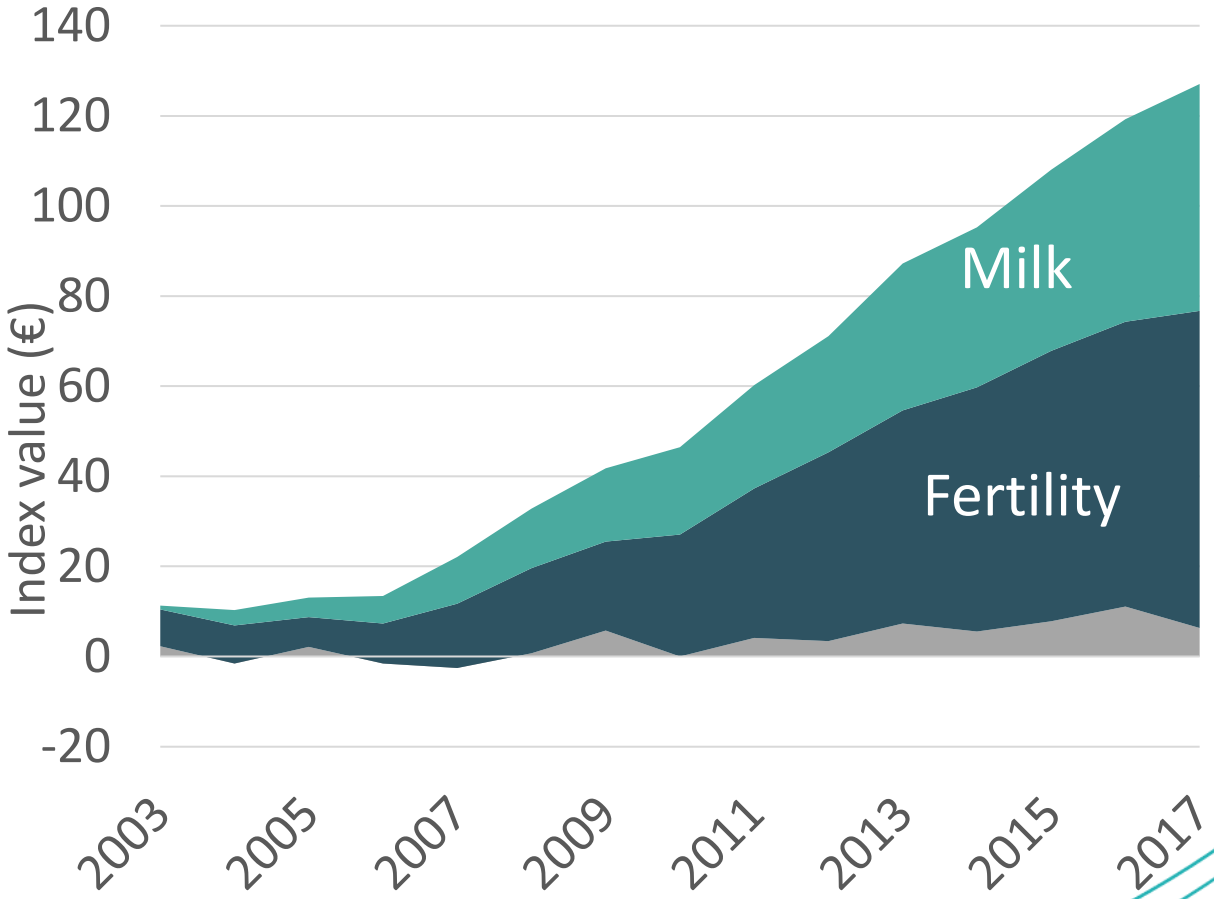
Accumulate – historic

Dairy production benefits worth **US$1.65b**

Value driven by fertility, then milk

Other traits (calving, health) modest

US$90 per dairy cow per year

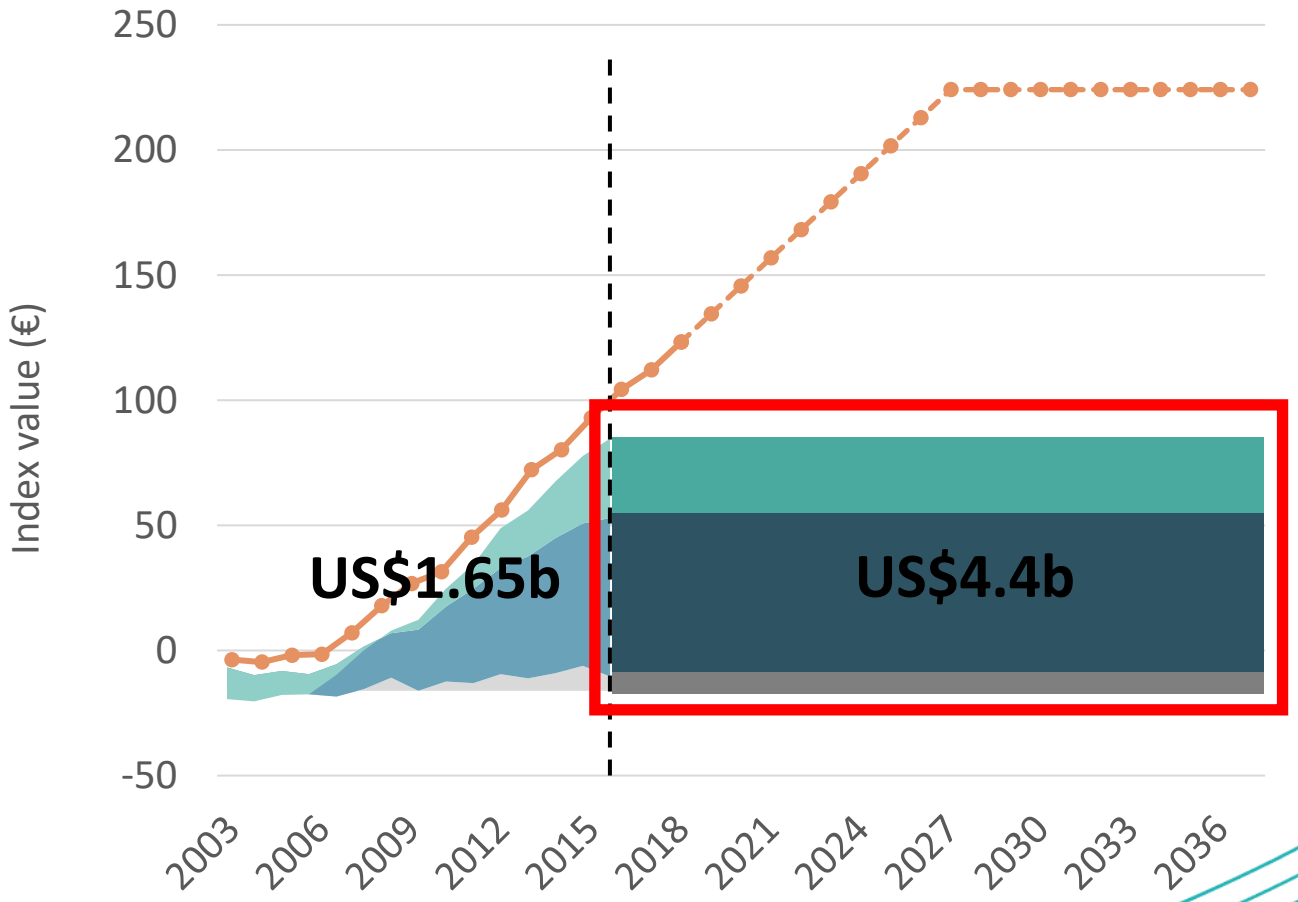


Accumulate – future

Past = US$1.65b

Permanent for 20 years

Value = US$4.4b

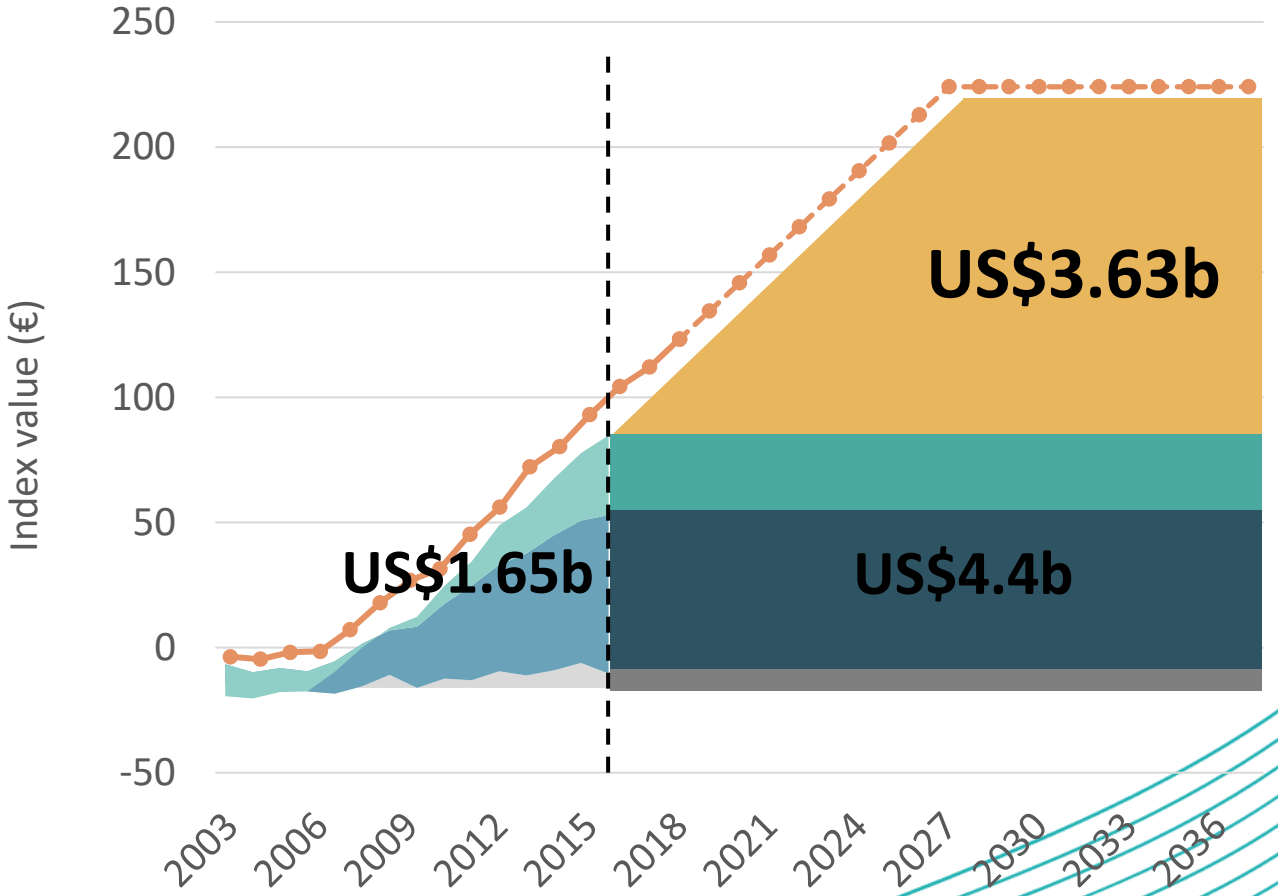


Accumulate – future

Sustain 10 more years of genetic improvement at current rate

Permanent for 10 years

Value = US$3.63b



Context is important

- Scale of the production impacts scale of value
- How to engage many producer stakeholders?
- Logistics of generating data in small scale producer industry
- Cost of genomics relative to value of animal (milk production)
- Infrastructure for dissemination of genetic merit (routine use of AI etc)

Take home

- There are formal processes to build a collective/ coordinated genetic improvement programs – requires a strategy
- Things don’t usually happen by the textbook - all the building blocks are essential

- Central data infrastructure and one version of the truth will underpin success
- All stakeholders must be involved for it to work – including in governance
- Genomics offers big value, but only with phenotypes/ data
- A formal national genetic improvement strategy offers huge value

- The context for roll out and adoption must be considered