

# Precision breeding opportunities in an evolving breeding objective landscape

Peter Amer, PhD

Look back over old ground

Where we are now

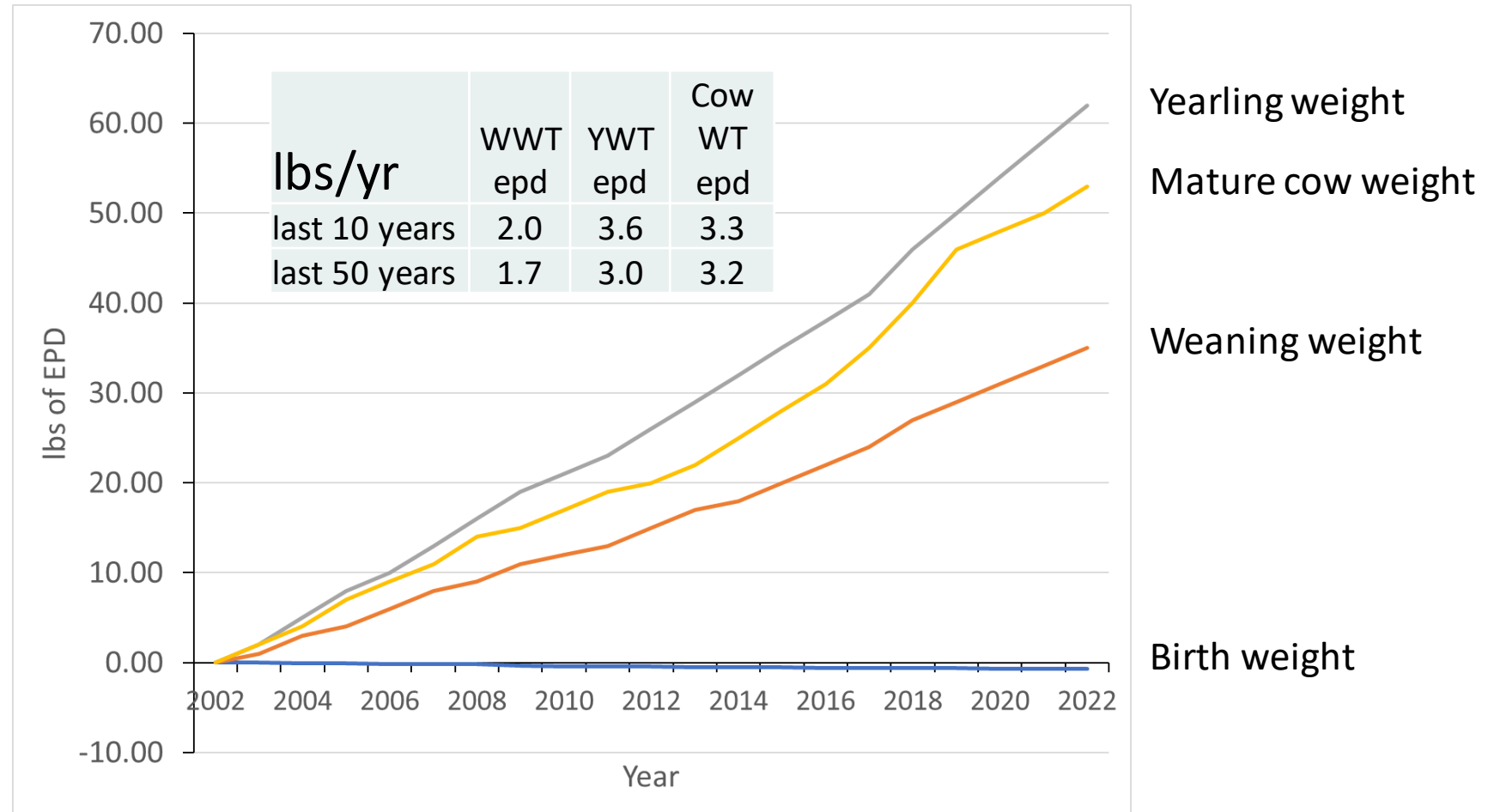
Forks in the road ahead



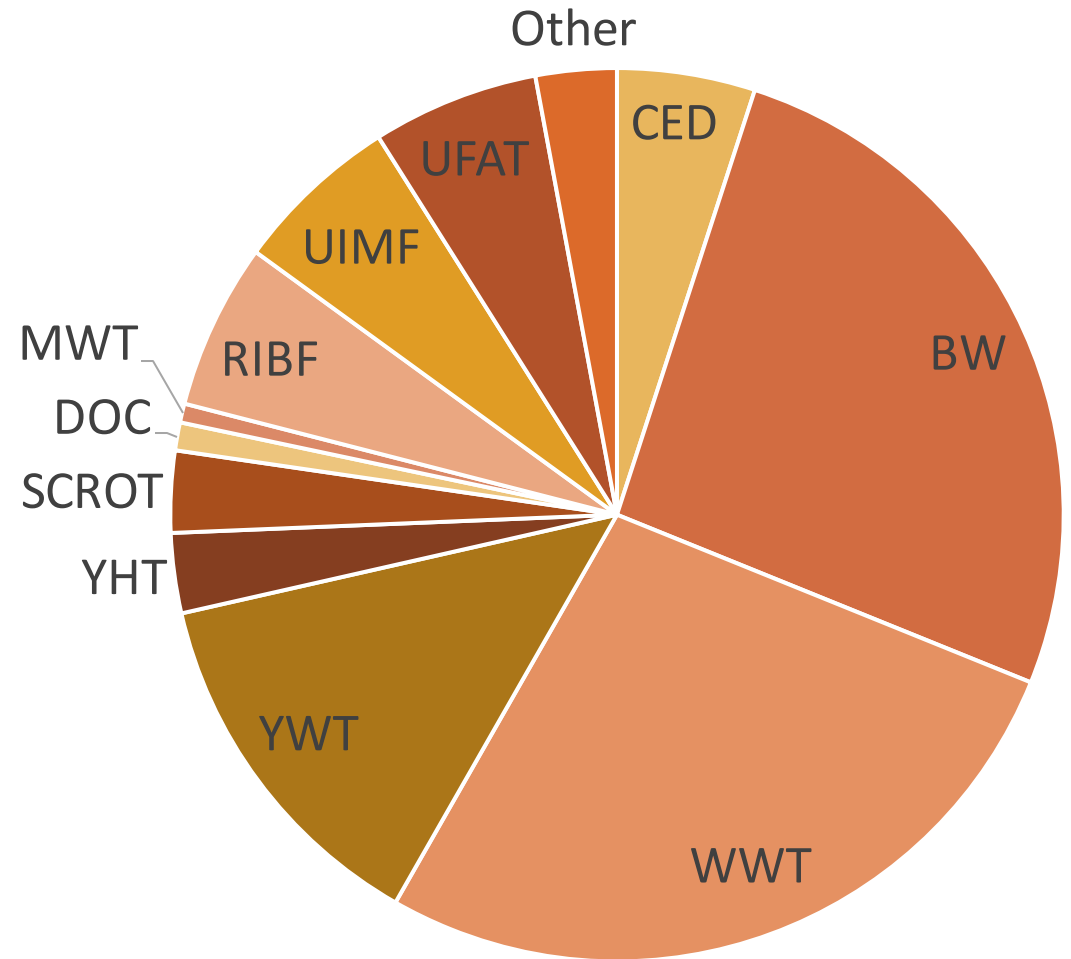
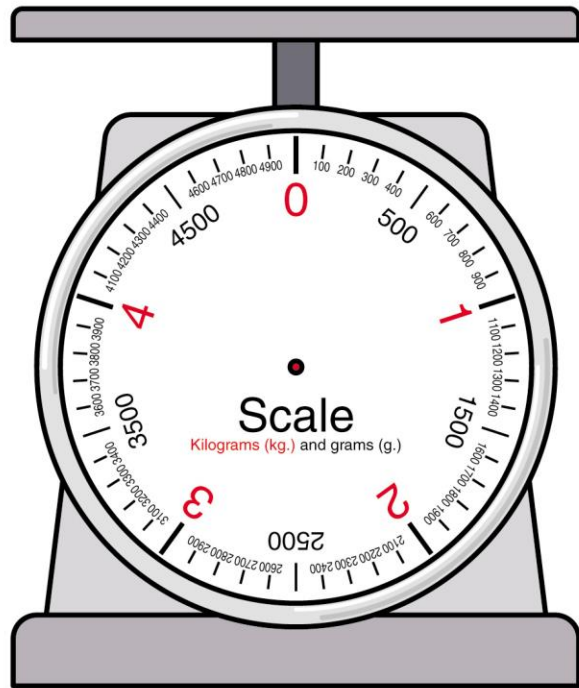
What is behind us?



# What genetic progress has been made?



# Key measurement technology!



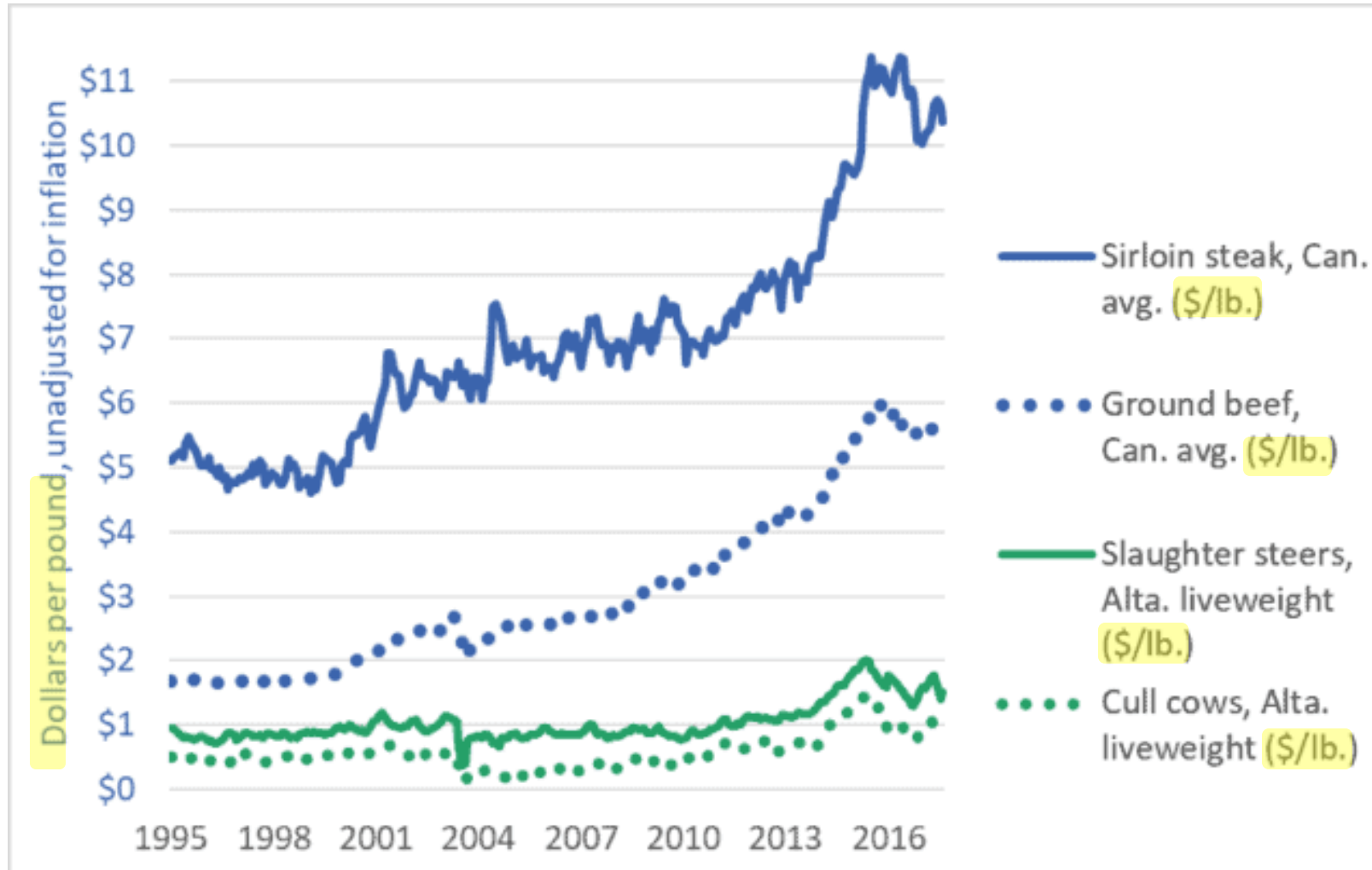
Number of records in the database

# The value of growth rate

- Beef packer \$\$
  - Labour
  - Transport
  - Infrastructure (throughput)
- Feedlot \$\$\$\$
  - Efficiency (dilution of maintenance)
  - Infrastructure (days on feed)
- Cow-calf \$
  - Weaner calf



# Market signals are clear for weights!!



Where are we at now?







Marbling



Heifer Pregnancy

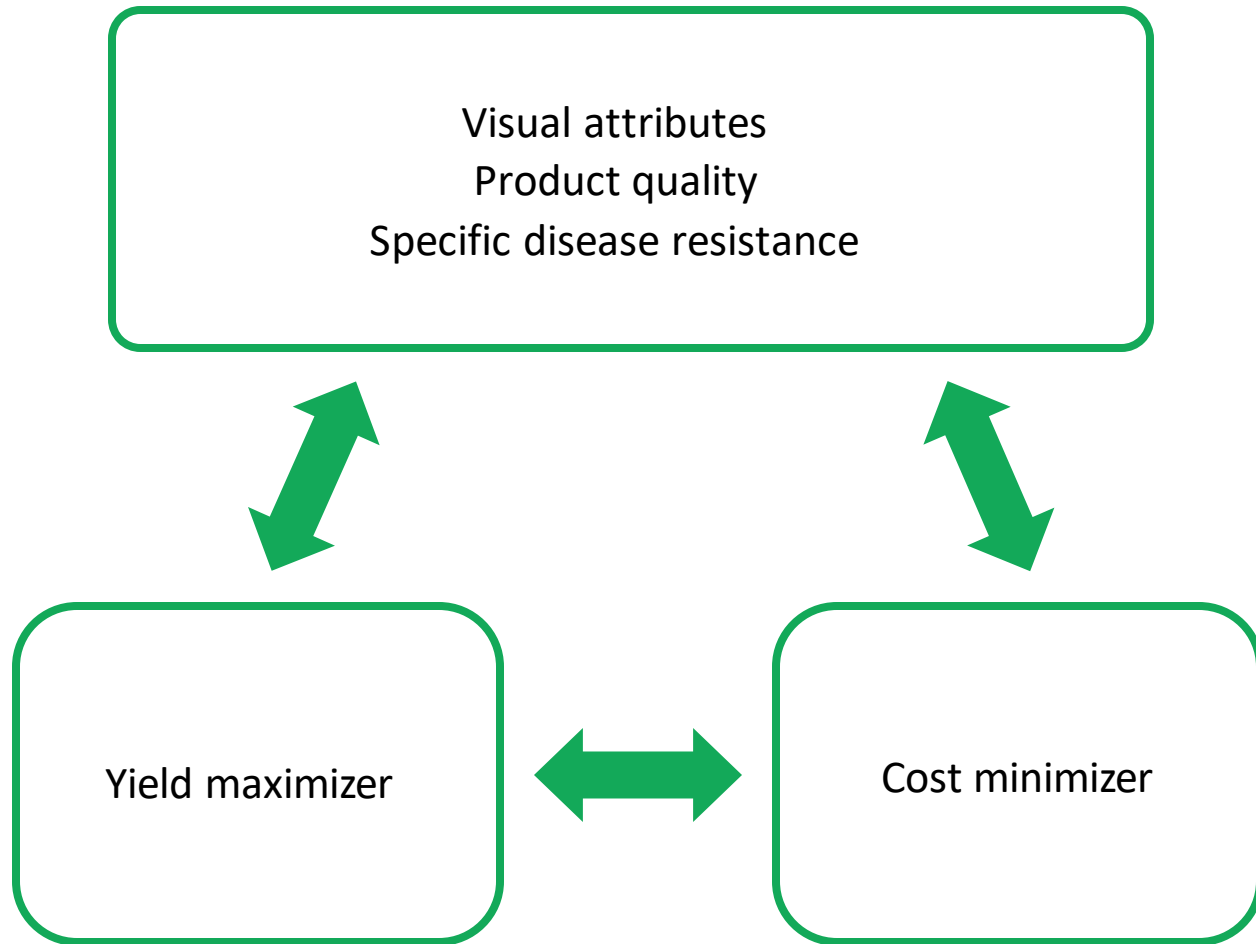


Stayability



Feed Efficiency

# Farmer typologies ... ... favour different traits



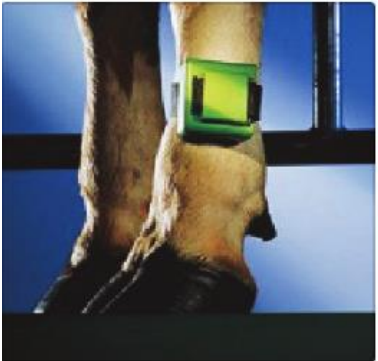
# What lies ahead?



# Wearable technology



Rumen bolus



# Wearables



front seat to the consequences of organized racism.

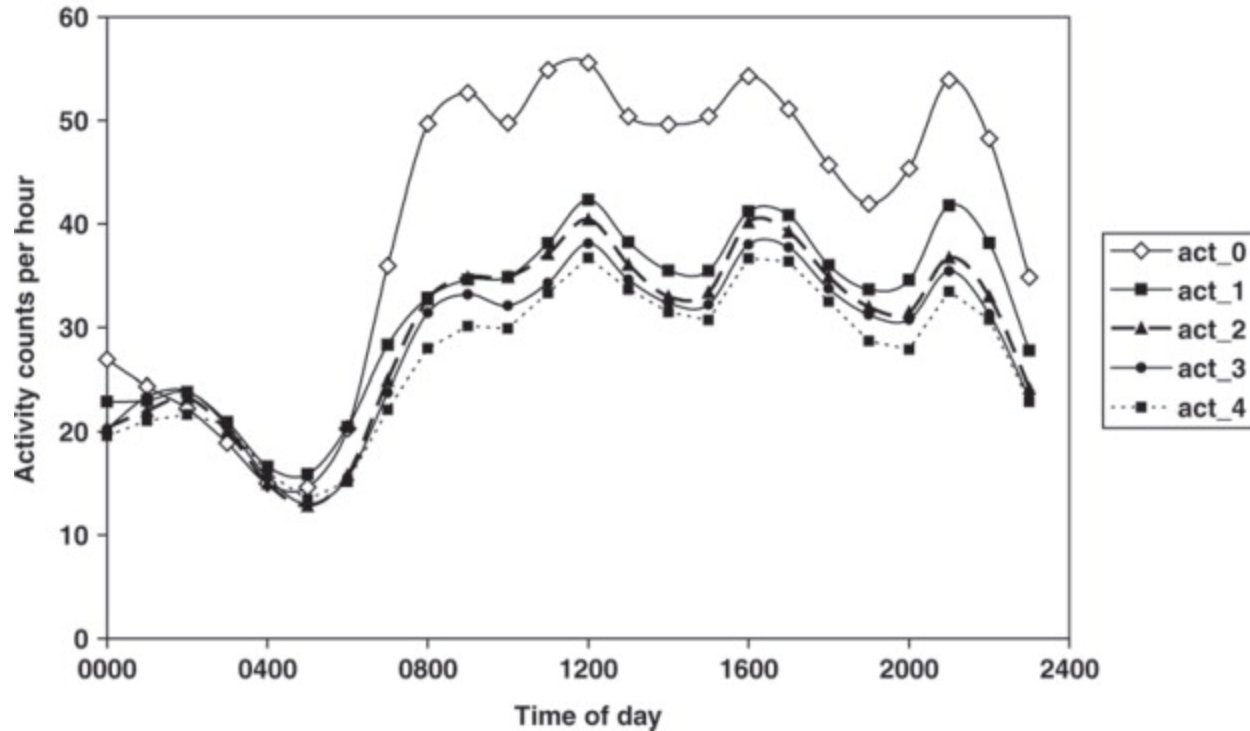
## Why 911 Dispatchers Hate Apple Watches

Dispatchers are being inundated with false, automated distress calls from Apple devices owned by skiers who are very much alive.



Theo Stroomer for The New York Times

MONITORING COW FERTILITY USING PHYSICAL ACTIVITY



A box of beef packaging with the brand name "Less-Gas" in large blue letters. It features a photograph of a brown and white cow's head. A yellow speech bubble on the box contains the text "15% LESS GAS" with a downward-pointing arrow. The side of the box also displays "15% LESS GAS".

In Canada, producing 1kg of beef now creates 15% less greenhouse gases than in 1981, due to improved production practices.

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# Dairy Indexes

Emissions



Growing population



**Gross**



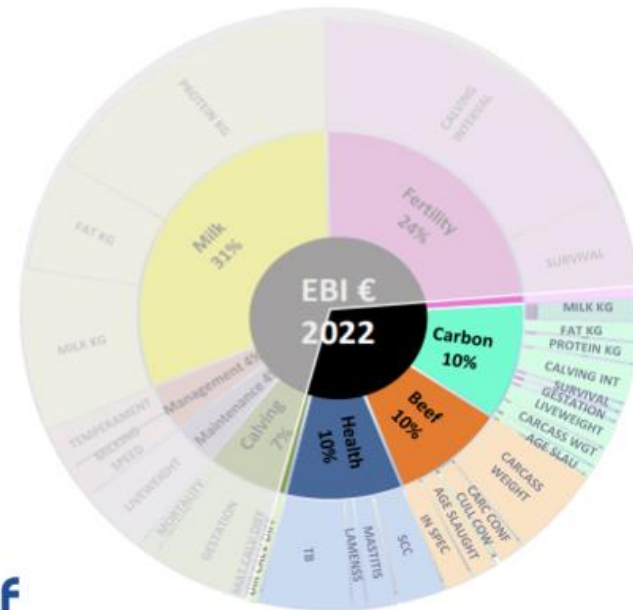
**Intensity**

# Genetic Indexes



## Sustainability Index

A breeding tool for a greener future



# Measuring methane.....?



Caeli's Criteria	<u>GreenFeed</u>	Sniffer	SF6
Accuracy	1 <sup>st</sup>	3 <sup>rd</sup>	2 <sup>nd</sup>
Volume	2 <sup>nd</sup>	1 <sup>st</sup>	3 <sup>rd</sup>
Labour	2 <sup>nd</sup>	1 <sup>st</sup>	3 <sup>rd</sup>
Cost	3 <sup>rd</sup>	1 <sup>st</sup>	2 <sup>nd</sup>
<b>Average score</b>	<b>2</b>	<b>1.5</b>	<b>2.5</b>



# Progress to date on methane

## Positives

- Works well in sheep
- Works well in dairy
- Lower (slightly!) cost options emerging
- Smaller faster rumen
- Change in the rumen microbiome



# Progress to date on methane



## Negatives

- Unknowns around mature cows at pasture
- Hard to measure feed intake
- Cost of recording
- Roughage intake important in beef cows in extensive systems

**What are the market signals?**

# Breeding for low emissions farming systems?

## Extensive

- Low supplementary feed = lower farm GHG

Lower cost of production

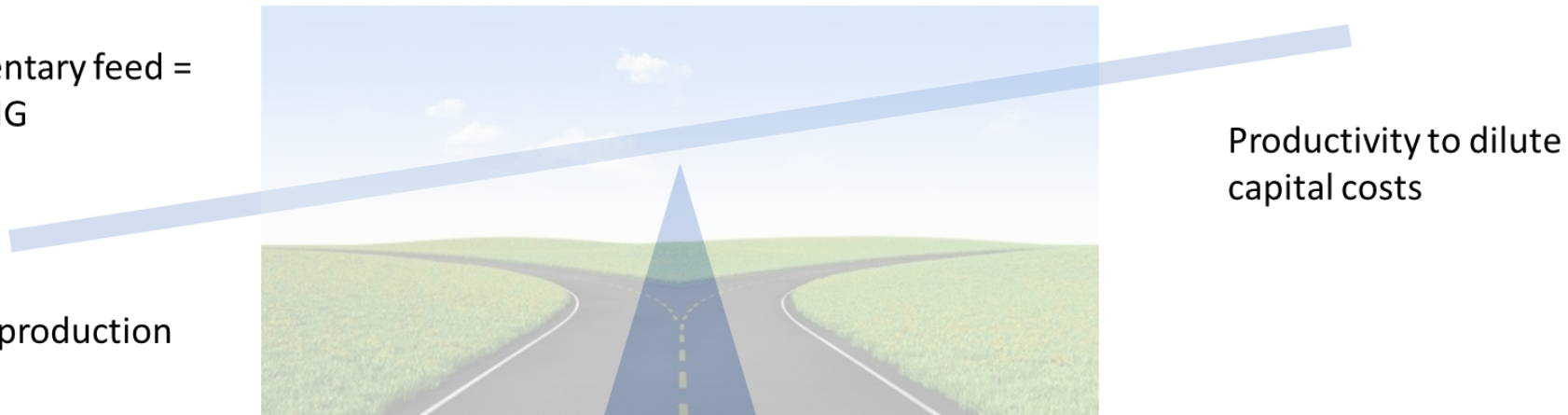
- Extended backgrounding/ grass finishing
- Lower national emissions
- Moderate sized, fertile, functional cow with easy to finish calf

## Intensive

- Dietary manipulation

Productivity to dilute capital costs

- North American default system
- Ongoing reductions in emissions per lb of beef
- Don't throw away the weigh scales!



# In summary

**Extensive beef systems  
requiring moderate size  
fertile functional cows**

- ++ Fertility
- ++ Body condition score
- + Stayability
- + Fatness/finish
- ? Methane
- ? Feed intake

**Intensive beef systems  
feeding methane reducing  
supplements**

- ++ Feed intake
- ++ Methane

