

**EURO FOOD 2015**  
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**Breeding cattle for a more efficient and sustainable milk  
and meat production**

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1950  
2.5 billion



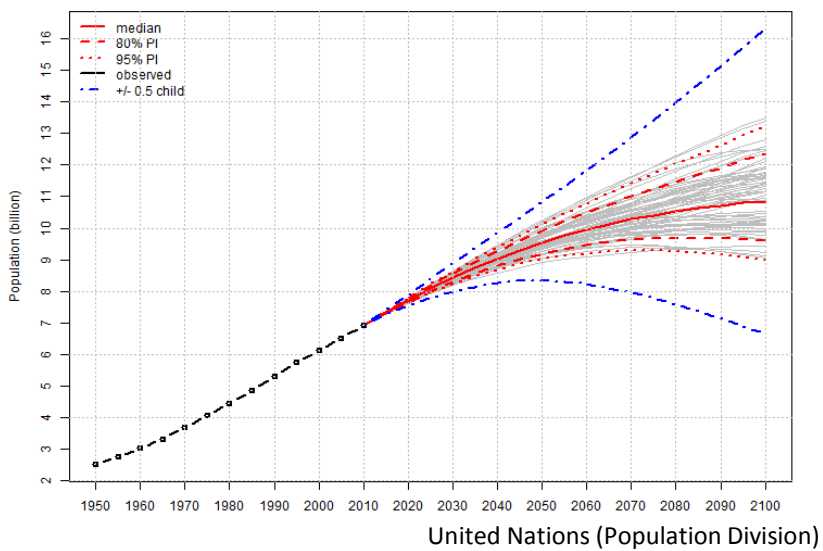
2015  
7.5 billion



2060  
10 billion?



WORLD: Total Population



## Producing high quality protein

- Animal production aims to transform inputs from plants into high quality protein



# Improvements in efficiency of poultry

1950



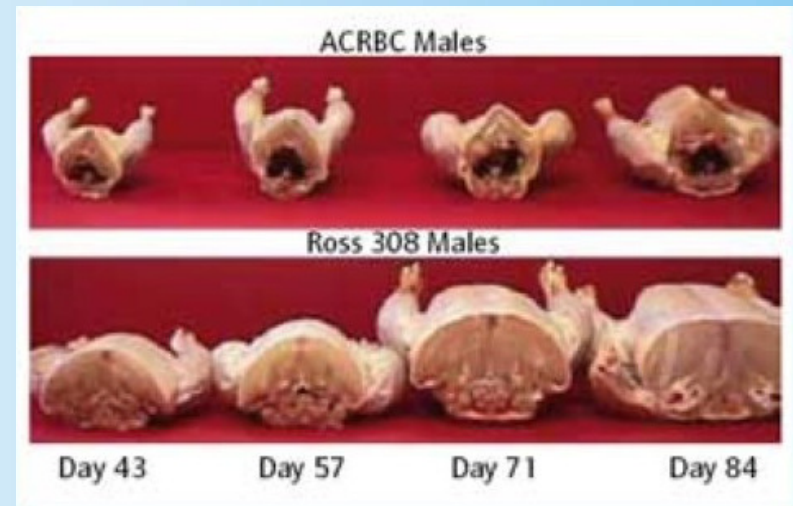
330kg meat per tonne of feed

2014



590 kg meat per tonne of feed

**77% improvement**



# Improvements in efficiency of cows

1950



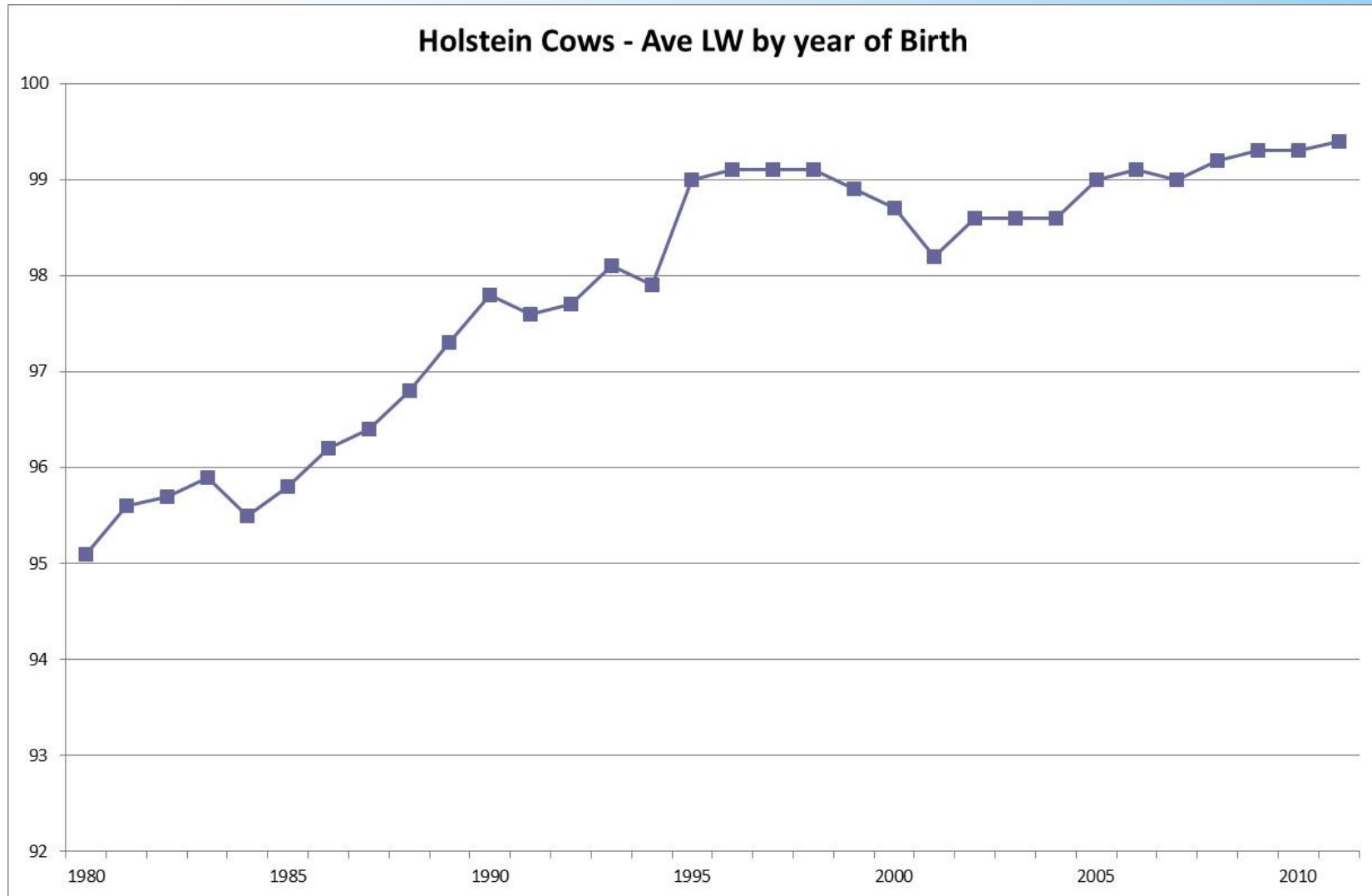
1746 litres/year  
350 kg liveweight  
5.6 litres/kg liveweight

2014

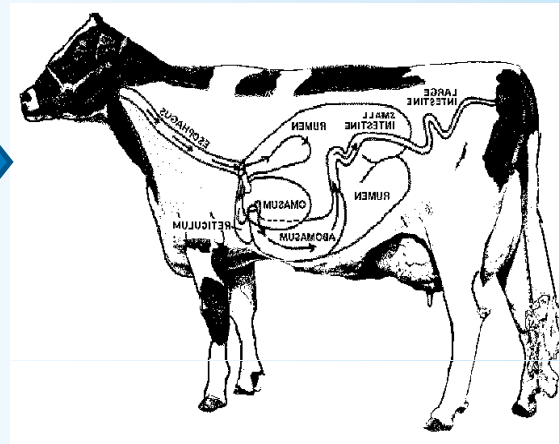


6890 litres/year (ADHIS)  
600 kg liveweight  
11.5 litres/kg liveweight

Doubled efficiency through dilution of maintenance



# GROSS EFFICIENCY



Faeces

Heifers	1 <sup>st</sup> Lactation	Subsequent Lactations
Energy Loss	Energy Loss	Energy Loss
Maintenance	Maintenance	Maintenance
Growth (Muscle & Fat)	Growth (Muscle & Fat)	Fat deposition
	Milk	Milk

# How much do they really eat?

Which cow is the most efficient converter of feed into product?





# Selection for gross efficiency



Difficult to measure (expensive infrastructure; experimental farms)

**Historically only through indirect indicators (live weight)**

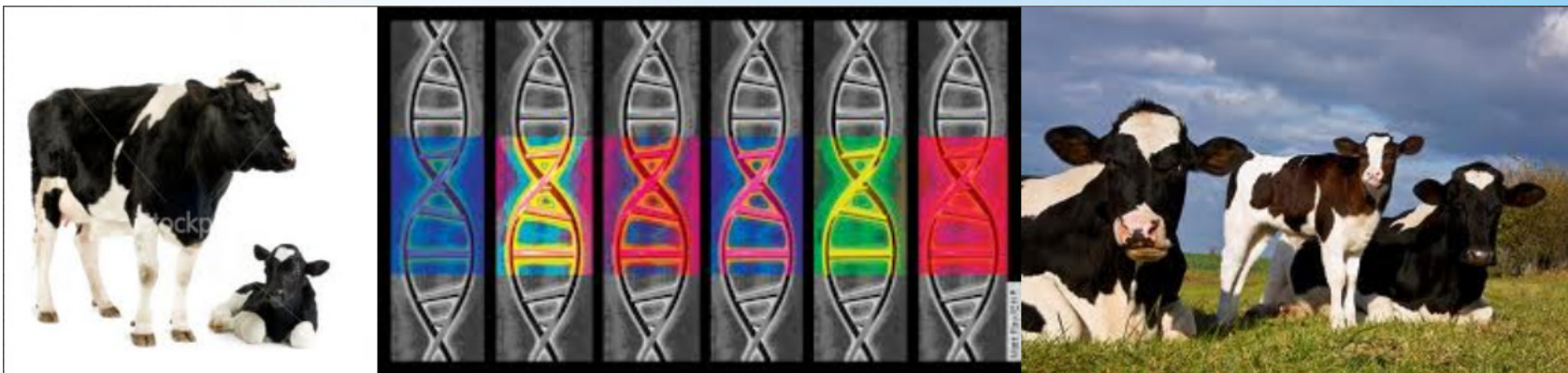
Importance:

- Feeding is 50% of production cost in animal farms
- Need to produce more food with the same resources
- Climate change might lower the amount of natural resources or artificial plantations
- Feed efficiency is associated with a lower amount of GHG emissions

# GENOMIC SELECTION

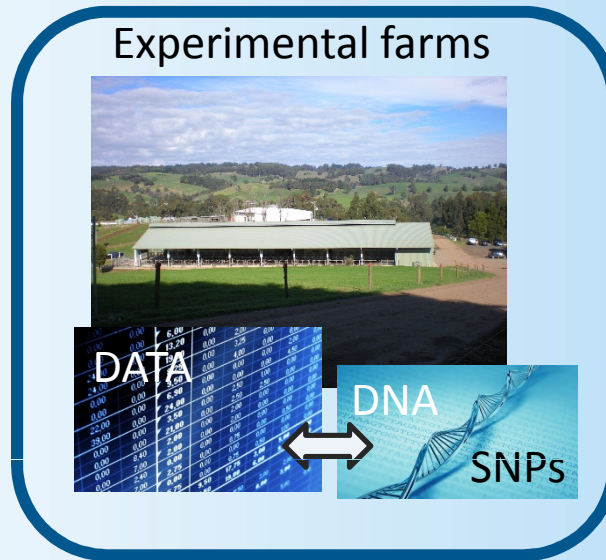
## Definition

Use of massive genomic information in the breeding programs



# GENOMIC SELECTION

How it works





Feed bin

Load cells

Feed intake unit

EID reader



Heifers and Cows  
Growth and Milk Yield



# What's their real efficiency?



6890 litres/year  
600 kg liveweight  
20 kg DM/d of feed



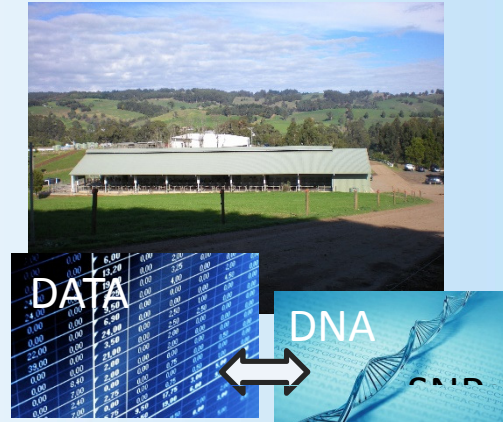
6890 litres/year  
600 kg liveweight  
19 kg DM/d of feed

Cow B is more efficient than cow A  
1 kg/d at \$0.3/kgDM is worth \$110/cow/year

# GENOMIC SELECTION

How it works

Experimental farms



Commercial farms



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