

# Economic values for organic dairy cattle production systems in Denmark

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# Background



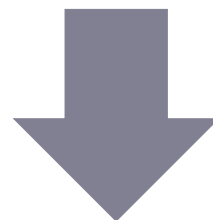
- In Denmark organic milk is ~ 30%
- However, only the farm management is specifically organic
- All breeding material originates from conventional dairy production

# Background



## Conventional breeding material a problem:

- 1) Sub-optimal genetic gain = Animals not adapted for organic production
- 2) Decreased farmer profit and lower consumer acceptance
- 3) Production systems and market demands may differ between conventional and organic farms



breeding goal tailored for organic production

# Aim

## **Ø-KO-AVL project:**

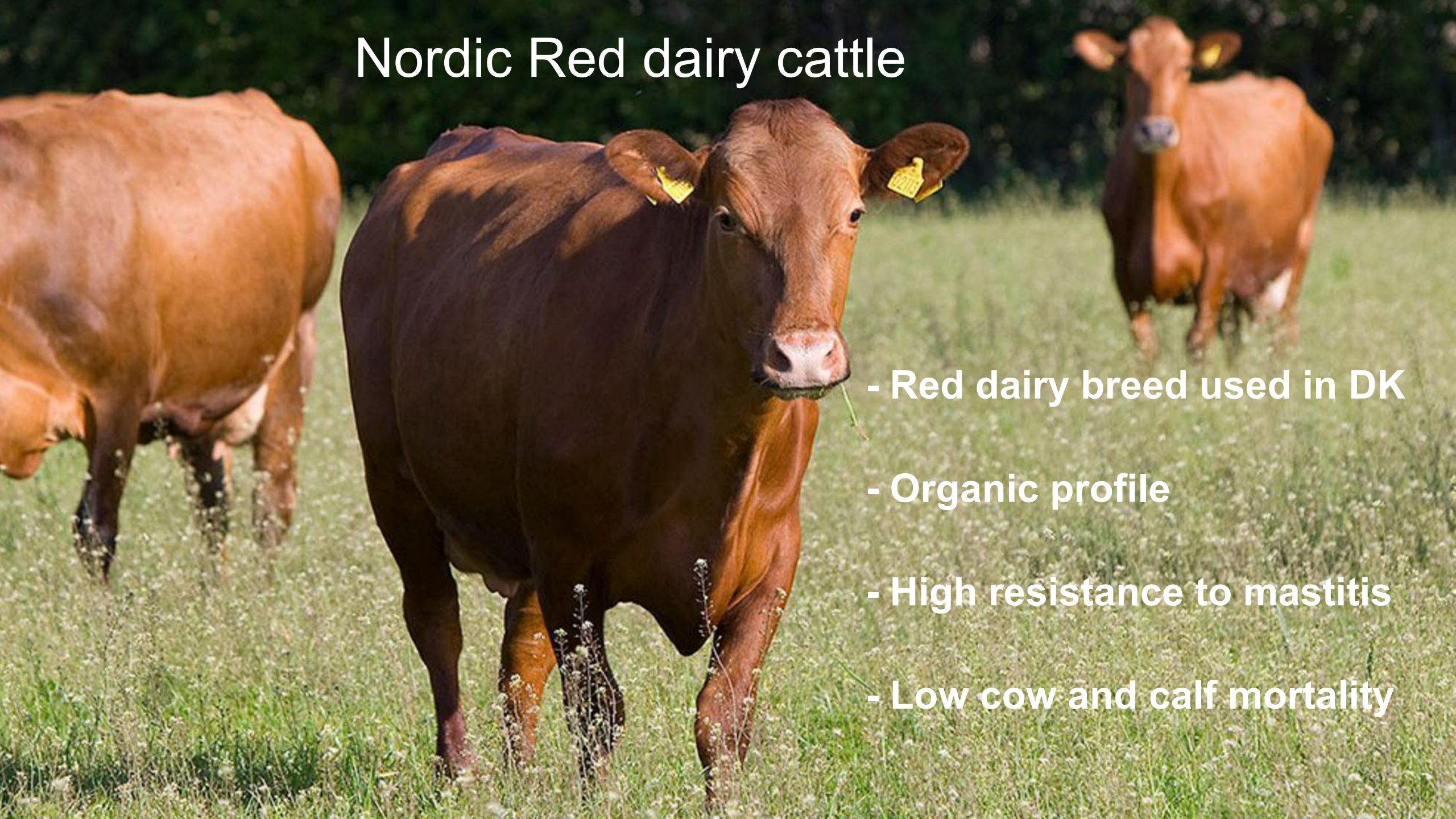
Develop a breeding program that is adapted to organic dairy production and consumer preferences

## **First step:**

Estimate economic values for future organic production systems

Develop a method to predict future production systems

# Nordic Red dairy cattle



- Red dairy breed used in DK
- Organic profile
- High resistance to mastitis
- Low cow and calf mortality

# Economic value

The breeding goal express the direction of genetic improvement with **traits** and their **economic values**

Change in profit of the **production system** by a unit genetic improvement in a given trait (Hazel, 1943)

Should be relevant when we see the result of genetic improvement

## How to predict future circumstances?



# Farmer sessions

- 2 workshops with 3-8 farmers

## Discussion:

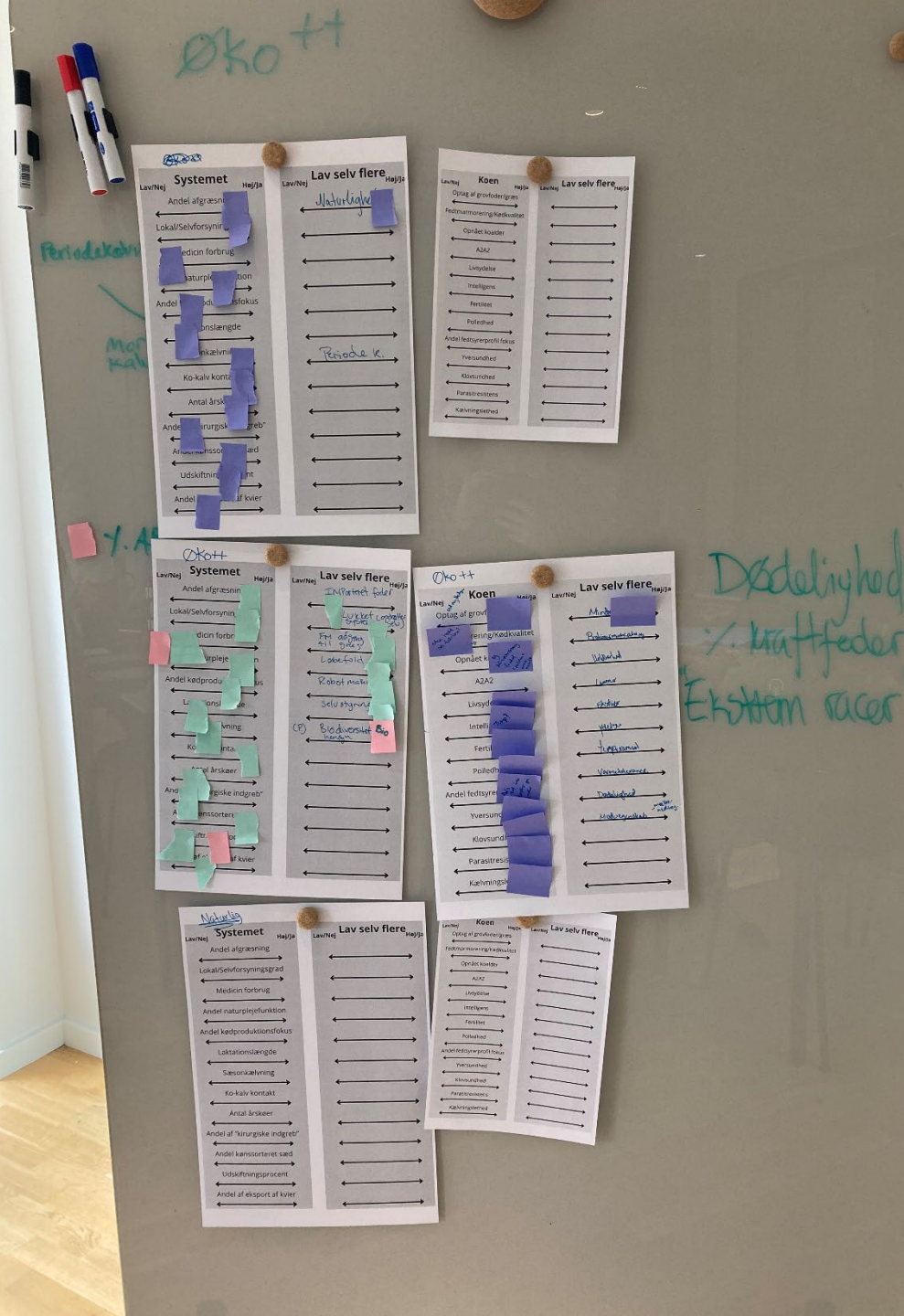
- 1) What are the future organic production systems?
- 2) Which traits characterize the future organic cow?



Define future production systems



Economic values



# 3 future production systems

| Characteristics | Present organic                 |
|-----------------|---------------------------------|
| # cows          | 400                             |
| Calving         | All year                        |
| Feeding         | 60% roughage<br>40% concentrate |
| Antibiotics     | +                               |
| Cow-calf        | Seperated                       |
| Beef calves     | Sold                            |

# 3 future production systems

| Characteristics | Conventional<br>organic         | Organic +                                      |
|-----------------|---------------------------------|------------------------------------------------|
| # cows          | 400                             | 200                                            |
| Calving         | All year                        | Seasonal calving<br>2 / yr                     |
| Feeding         | 60% roughage<br>40% concentrate | Grazing<br>Silage<br>Locally grown concentrate |
| Antibiotics     | +                               | +                                              |
| Cow-calf        | Separated                       | With a cow 3 month                             |
| Beef calves     | Sold                            | Grown at farm                                  |

# 3 future production systems

| Characteristics | Conventional organic            | Organic +                                      | Low-input/<br>low-output              |
|-----------------|---------------------------------|------------------------------------------------|---------------------------------------|
| # cows          | 400                             | 200                                            | 100                                   |
| Calving         | All year                        | Seasonal calving<br>2 / yr                     | Seasonal calving<br>1 / yr            |
| Feeding         | 60% roughage<br>40% concentrate | Grazing<br>Silage<br>Locally grown concentrate | Grazing<br>Silage + hay during winter |
| Antibiotics     | +                               | +                                              | No milk from treated cows             |
| Cow-calf        | Seperated                       | With a cow 3 month                             | With a cow 5 month                    |
| Beef calves     | Sold                            | Grown at farm                                  | Grown at farm                         |

Milk yield

Disease traits

Reproduction traits

Longevity

Calving ease

Calf survival

Feed efficiency

Methane emission

Grazing ability

Cow-calf relationship



# Method – simulation

Simherd (Østergård et al., 2014) :

Simulates a dairy farm

Mechanistic, dynamic and stochastic model

Changes in a trait corrected for genetic changes in other traits in the breeding goal

# Eco. values for mastitis in 2 systems

| Conventional<br>organic | Low-input /<br>low-output |
|-------------------------|---------------------------|
| 365€                    | 554€                      |

← No milk from  
cows with  
mastitis

Treated cows slaughtered  
Higher replacement



# Conclusion

- Production system highly impact EV of traits (mastitis)
- Farmer sessions can be used to define future circumstances
- Next step consumers studies



# Thanks to:



Innovation Centre  
for Organic Farming



**ICROFS**

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