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FABRE • TP
Farm Animal Breeding
& Reproduction
Technology Platform

# A scientific perspective

# How breeding strategies work: defining breeding objectives


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# Animal breeding is part of a system

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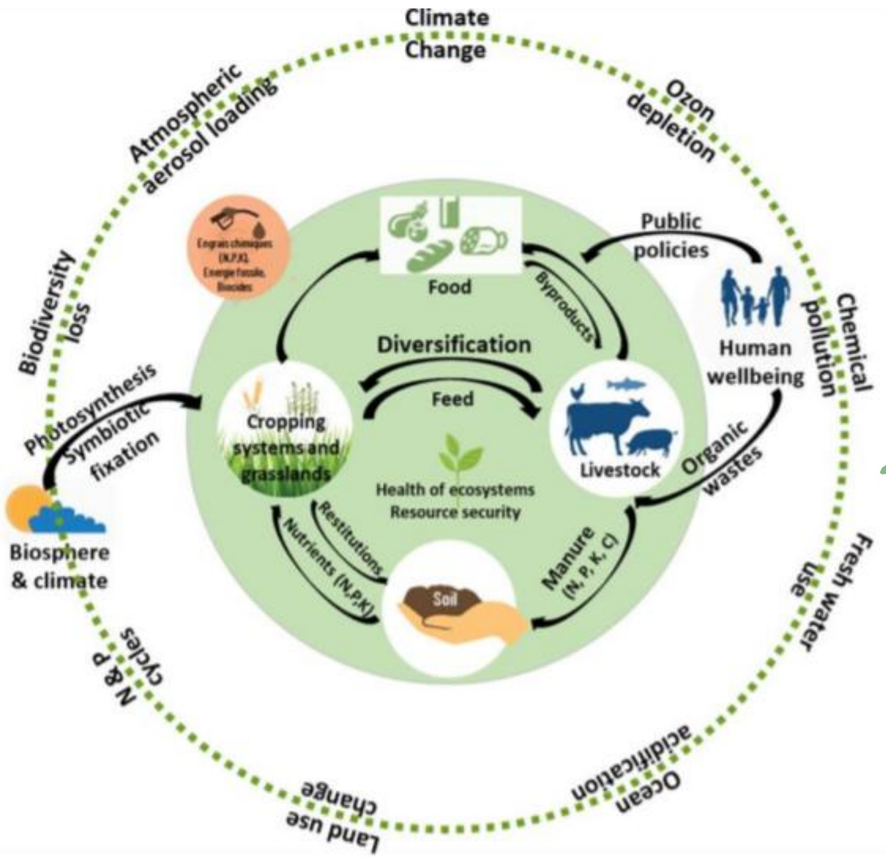
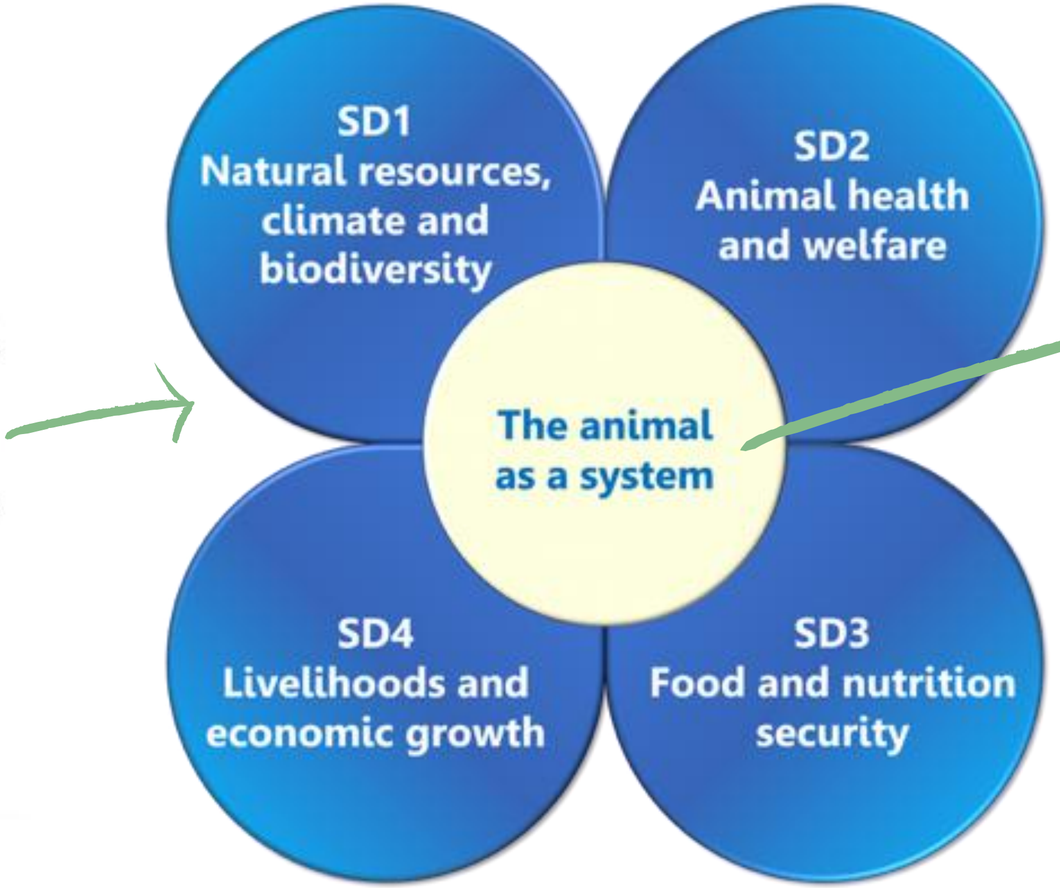



*Figure 1. Role of livestock farming in sustainable agri-food systems*

ATF SRIA, 2024




Animal Genetics
&
Breeding

# Tools to improve livestock sustainability

1

## Genetics & Breeding

Selection for multi-trait efficiency including feed use, climate mitigation (emissions) and adaptation, resilience and robustness, reproductive traits, longevity and welfare.

2

## Nutrition & Feeding

Precision nutrition, novel feed resources, microbiome optimization and mitigation of emissions .

3

## Animal Health & Welfare

Disease prevention, precision health and welfare monitoring and alternatives to antimicrobials.

4

## Technology & Data

Real-time sensor networks for performance monitoring, digital twins and AI-driven decision support

EU Transparency Register number : 398736910798-22

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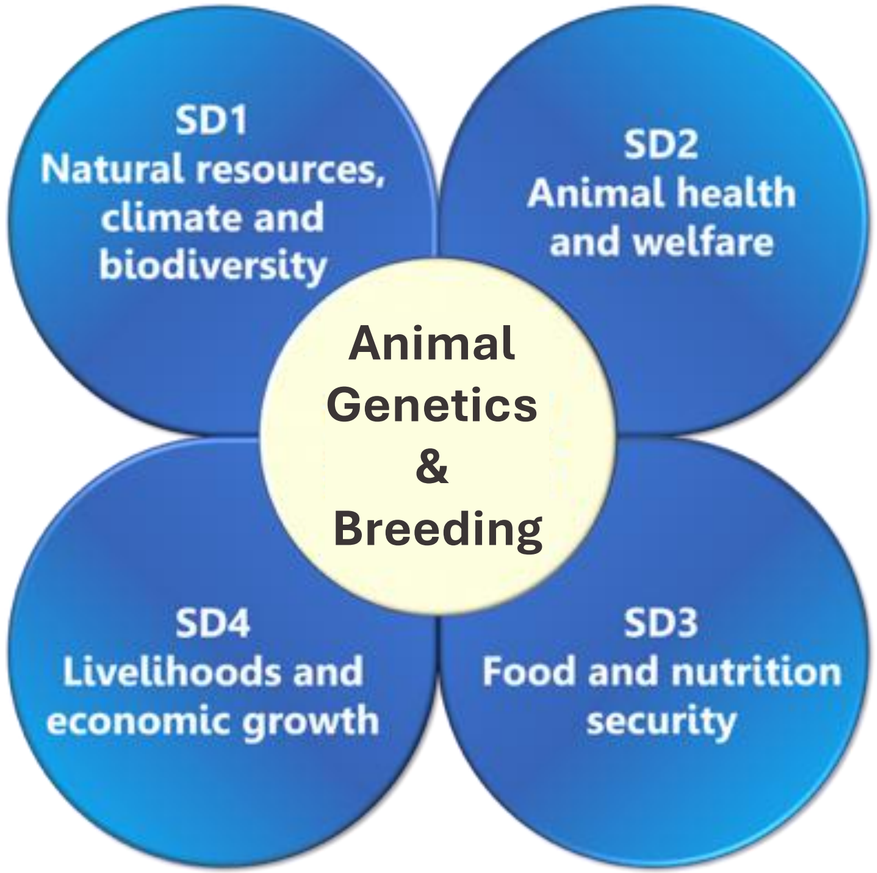


- It makes animal populations evolve
- It takes time, depending on the interval between generations
- It needs phenotypes to be measured (*breeding objective*) ➔ lot of data to be compiled and analysed

# Animal breeding relies on mathematics applied to biology

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**P**henotype = **G**enotype + **E**nvironment

*(What an animal looks like)*

*(Genes)*

*(Environment in which it lives)*

Animal ‘qualities’ (traits) are translated as **breeding values** for a number of interesting and desirable traits

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# **P**henotype = **G**enotype + **E**nvironment

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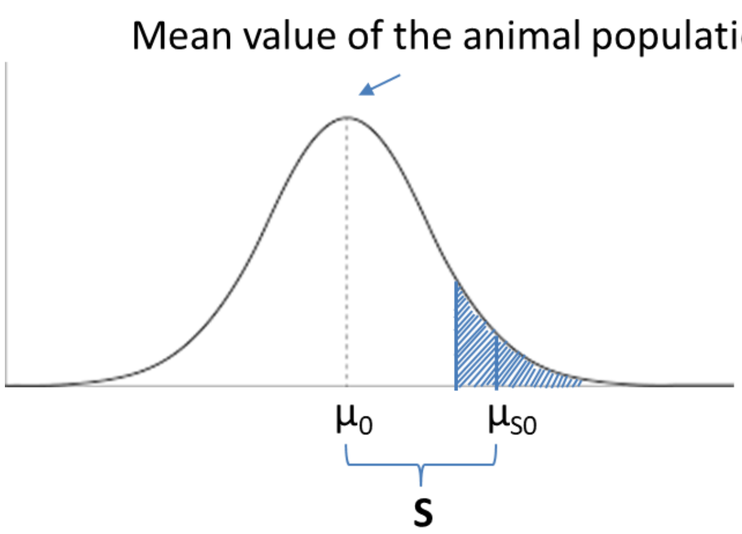


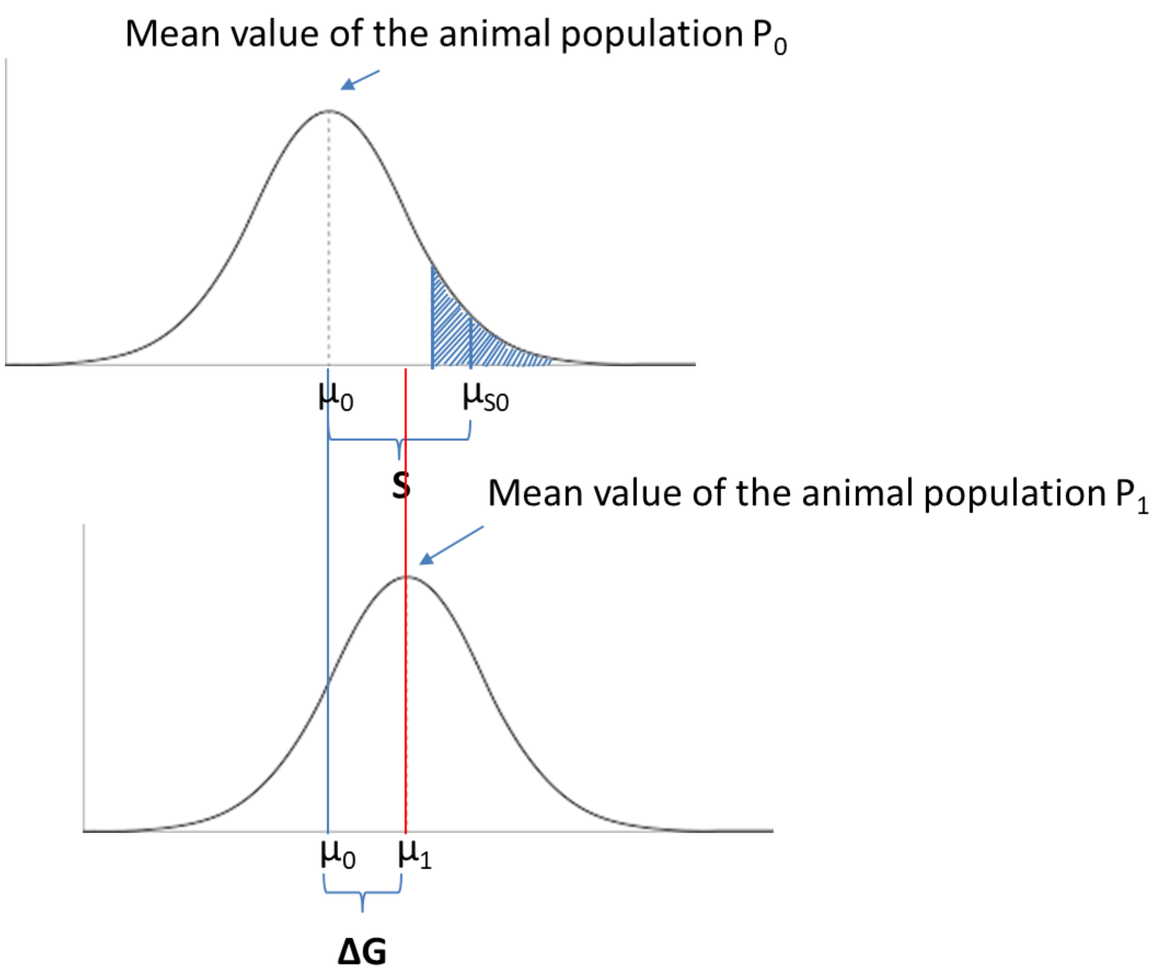


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# A simple definition of animal breeding

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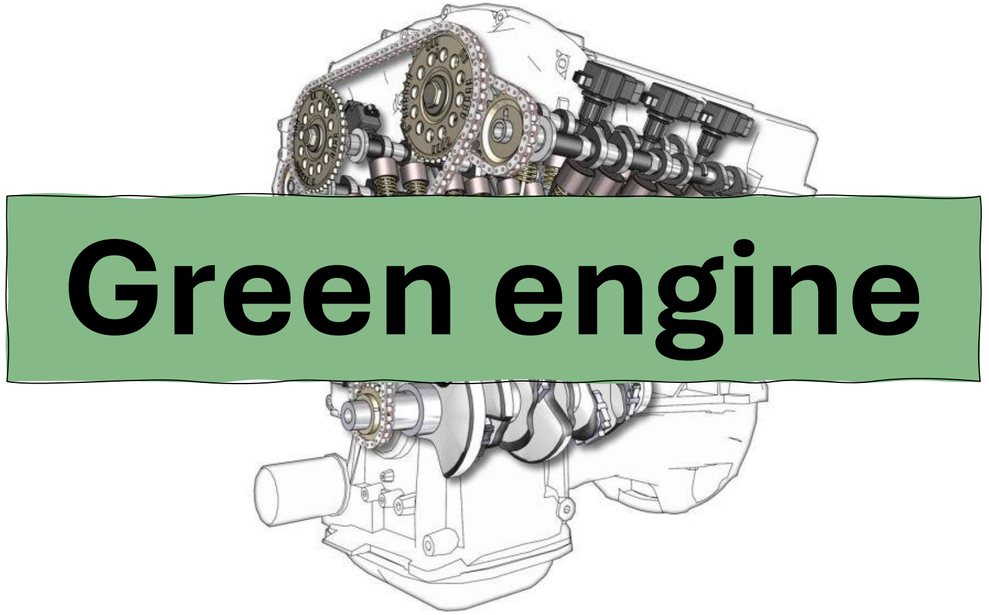
«An ensemble of knowledge and technologies»

(the **engine** of the animal production sector)



# Performances of this engine

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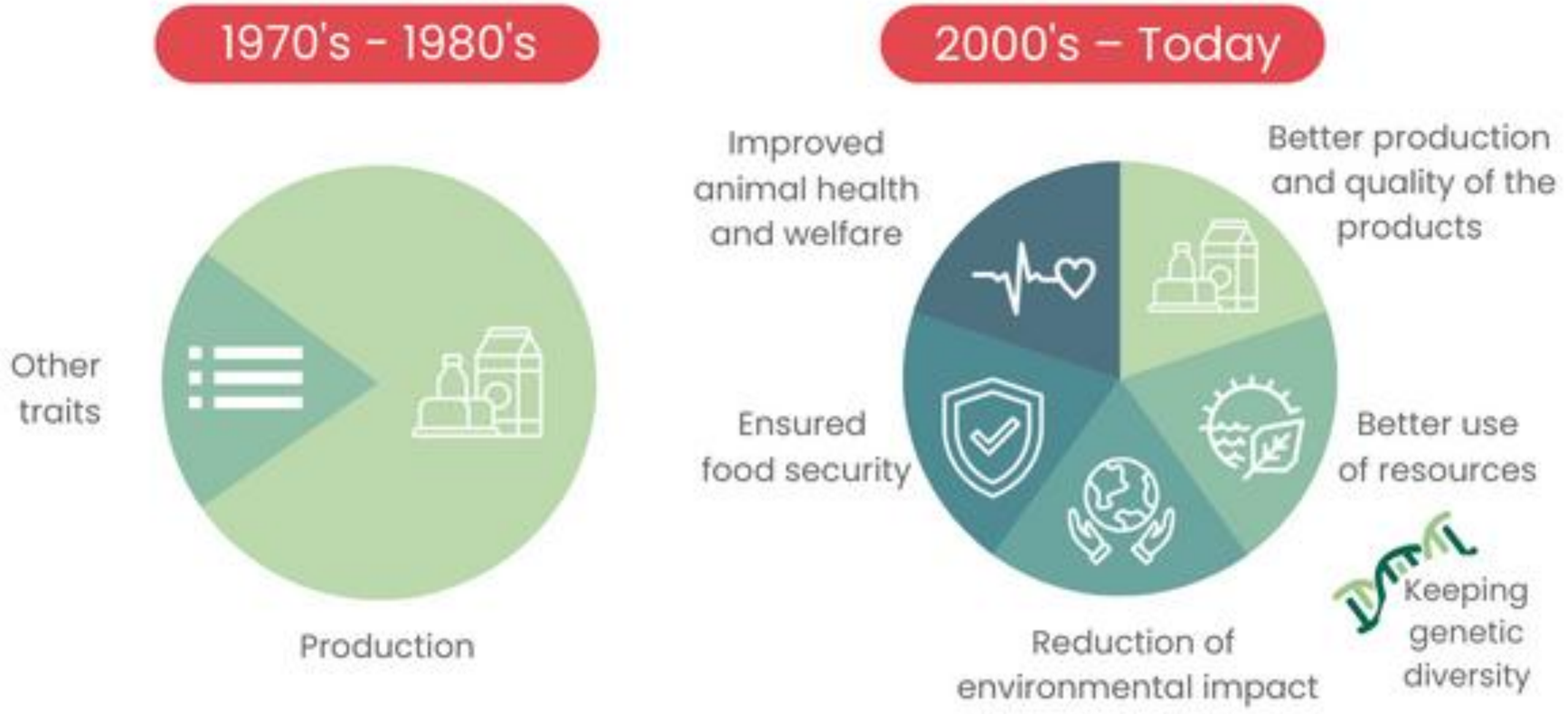

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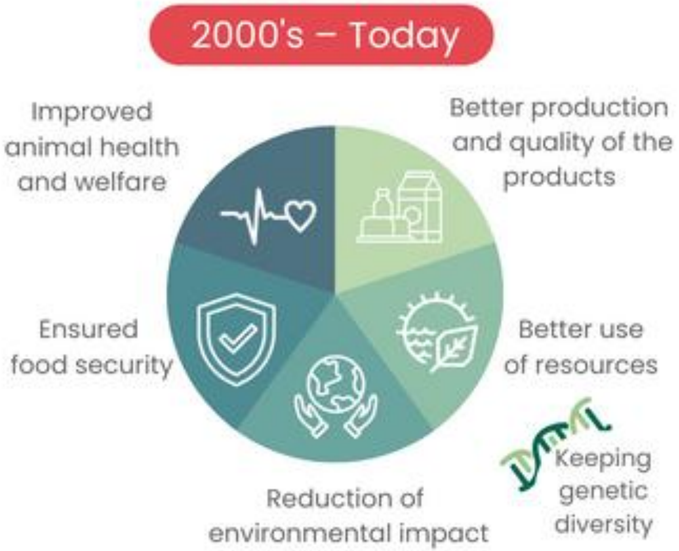
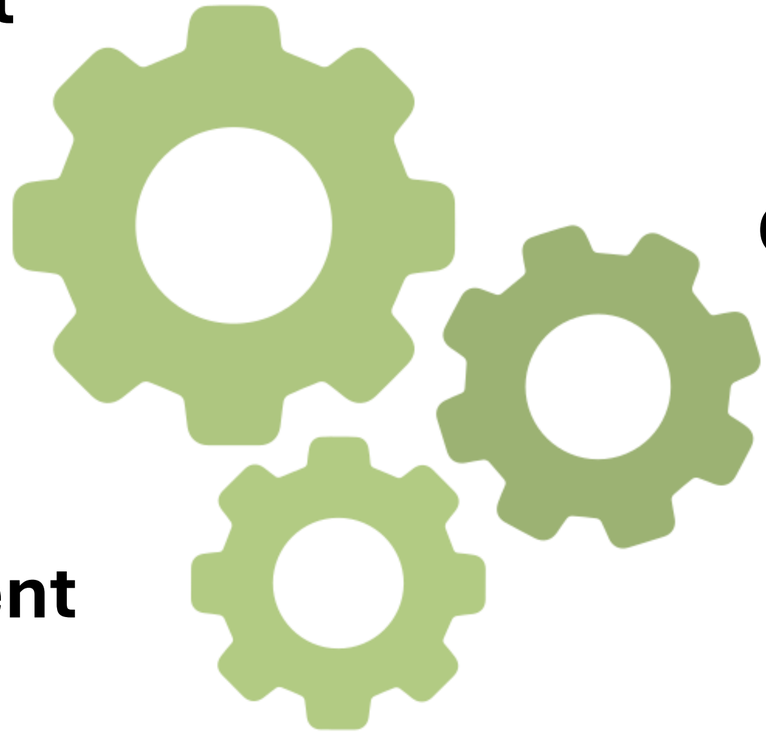



**Low cost**



**Cumulative**

**Permanent**

# Performances of this engine

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1

## THE ENVIRONMENTAL BENEFITS OF BREEDING

Methane emissions reduced **by 1% annually**

Nitrogen excretion cut **by 3.5% every 5 years**

2

## POSITIVELY IMPACTING THE ECONOMICS OF FARMS

**30% less feed usage** compared to 30 years ago, boosting environmental and economic outcomes

3

## SOCIAL IMPACT IN OUR FARMS AND COMMUNITY

High-quality germinal products and breeding animals for diverse farming systems **support farmers' livelihoods** in European rural and coastal areas

4

## ENHANCING ANIMAL HEALTH AND WELFARE

**Animal Welfare** traits prioritised
**Disease resistance** enhanced
**Antibiotic use** reduced

# Animal breeding relies on mathematics applied to biology

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To fuel innovation in European animal breeding and support farmers sustainability

**We need supported EU research and innovation**

**FOUR KEY PILLARS**

**Resilience & Competitiveness**

**Green Transition**

**Social Acceptance & Awareness**

**Knowledge & Innovation**

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# Conclusions

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- Animal breeding and reproduction is a **green engine**, essential for the sustainability of the EU agriculture
- This needs investment in EU R&I, and the declining trend must be reversed.
- We are ready to contribute with **practical proposals** to **put** animal breeding and reproduction **at the core** of EU innovation investment