

Future-ready breeding!

How RUMIGEN supports practical breeding goals for resilience, welfare and genetic diversity

What did RUMIGEN look at?

RUMIGEN looked at how dairy breeding goals can be adapted for future conditions.

The project brought together results on heat stress, fertility, animal health, welfare, genetic diversity, epigenetics, genome editing and societal acceptance.

The aim was to turn these scientific results into practical breeding guidelines for more resilient, healthy and diverse dairy cattle.

What was found?

RUMIGEN showed that future breeding programmes need to balance several goals at the same time.

Cows should not only produce well. They should also stay healthy, remain fertile, cope better with heat, and belong to breeding populations that keep enough genetic diversity for the future.

RUMIGEN showed that breeding programmes should focus on selecting animals that still perform well in hot and humid conditions. This is more practical than focusing on how much performance changes as temperatures rise.

Why is this important?

Climate change, disease pressure, welfare expectations and market changes are making breeding decisions more complex.

Breeding has long-lasting effects because genetic progress is passed on to future generations. This means today's breeding goals can shape the animals of tomorrow.

If breeding focuses too narrowly on one trait, it can create problems for health, fertility, welfare or diversity. Balanced breeding helps avoid these trade-offs.

Why does this matter?

For policymakers, this shows that breeding is part of climate adaptation, animal welfare, food security and biodiversity protection.

For the livestock sector, it means breeding programmes need practical tools to combine productivity with resilience and responsibility.

For society, it means breeding innovation should be transparent, well justified and aligned with public expectations.

What does this mean in practice?

- Breeding goals should include productivity, fertility, health, welfare, heat resilience and genetic diversity.
- Heat resilience should look at both normal performance and performance under heat stress.
- Health and welfare traits should be treated as core breeding goals, not add-ons.
- Genetic diversity should be protected through clear safeguards, such as limiting inbreeding and avoiding overuse of a small number of sires.
- Breeding recommendations should be transparent and easy to explain to farmers, policymakers and society.

Key takeaway

RUMIGEN shows that future breeding should be balanced by design. The strongest breeding programmes will not select for one trait alone, but combine productivity, health, fertility, welfare, heat resilience and genetic diversity in clear and responsible breeding guidelines.

RUMIGEN is an EU-funded project working to improve livestock breeding by combining genetic, epigenetic, and phenotypic knowledge to support more sustainable and resilient animal production.

