

Breeding for balance

How RUMIGEN supports cattle that are productive, healthy and better prepared for heat stress

What did RUMIGEN look at?

RUMIGEN looked at how dairy cattle perform when temperatures rise. The project combined farm performance records, fertility data, udder health information, animal family records, DNA data and weather data.

The aim was to understand which animals cope better with heat stress, and how breeding programmes can support cattle that are not only productive, but also fertile, healthy and resilient.

What was found?

RUMIGEN showed that heat stress can affect milk production, fertility and udder health, but not always in the same way. Some animals lose less performance when temperatures rise, while others are more affected.

The project also showed that breeding for heat resilience cannot be based only on milk yield. Fertility and health also need to be included, because an animal that keeps producing milk under heat stress is not always the animal that stays fertile or healthy.

RUMIGEN also found that modern breeding tools can support genetic progress without automatically damaging genetic diversity, but only if breeding programmes are carefully managed.

Why is this important?

Climate change means that cattle will face more frequent warm periods and heat stress. Farmers need animals that can continue to perform under these conditions without losing fertility, health or welfare.

Breeding is important because its effects are long-lasting. Better breeding decisions today can support future generations of animals that are better adapted to changing conditions.

Why does this matter?

For policymakers, this shows that climate adaptation in livestock is not only about buildings, ventilation, shade or feed. These are important, but breeding also has a major role.

For the livestock sector, the message is clear: future breeding goals must be balanced. Productivity matters, but it should be improved together with fertility, health, welfare, resilience and genetic diversity.

What does this mean in practice?

- Breeding programmes should include heat resilience as part of future breeding goals.
- Fertility and udder health should remain central, because they are closely linked to animal robustness.
- Weather data can be combined with farm records to better understand how animals respond to heat.
- Local and smaller breeds should be managed carefully to protect genetic diversity.
- Modern breeding tools should be used with safeguards, so genetic progress does not come at the cost of long-term diversity.
- Balanced breeding approaches, such as those promoted through Code EFABAR, can help align productivity with animal health, welfare, sustainability and diversity.

Key takeaway

Future cattle breeding should not focus on a single trait. RUMIGEN shows that balanced breeding can help develop animals that are productive, healthy, fertile and better prepared for a changing climate.

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.

