

A measured look at gene editing!

What RUMIGEN learned from genome editing in goats and sheep?

What did RUMIGEN look at?

RUMIGEN explored whether gene editing could help address specific challenges in ruminant breeding. The project looked at two practical examples: goats with targeted changes linked to resistance against prion disease, and sheep carrying a mutation linked to better heat tolerance. The aim was not to promote gene editing as a general solution, but to test where it could be useful, what limits it has, and what safeguards are needed.

What was found?

RUMIGEN showed that gene editing can be used to introduce targeted genetic changes in ruminants. In goats, the work focused on the PRNP gene, which is linked to prion disease resistance. In sheep, the work explored a heat-tolerance mutation known from cattle. The project also showed that creating an edit is only one part of the story. Edited animals still need careful health, welfare and performance assessment. The edited trait also needs to be managed properly in breeding programmes, otherwise it may not deliver long-term value.

Why is this important?

Animal breeding needs new ways to support disease resistance, climate adaptation and animal welfare. Gene editing may help in some cases, especially when the target trait is clearly understood and difficult to introduce quickly through conventional breeding. But gene editing also raises serious questions. Is the edit safe? Does it benefit the animal? Is it needed? Who decides? How is it regulated? These questions cannot be ignored.

Why does this matter?

For policymakers, RUMIGEN shows that gene editing should not be judged only as “good” or “bad.” It should be assessed case by case, based on purpose, evidence, safety, animal welfare and societal expectations.

For the livestock sector, the message is similar. Gene editing is not a replacement for good breeding programmes. It could become one additional tool for specific problems, but only when the benefit is clear and the process is responsibly governed.

What does this mean in practice?

- Gene editing should be considered only for clear and well-justified breeding goals.
- Animal health and welfare assessment must remain central before any wider use.
- Edited traits need to be tested under real biological and farming conditions.
- Breeding programmes must plan how to use and maintain edited traits over time.
- Public dialogue, transparency and traceability are essential for trust.
- Gene editing should sit within balanced breeding goals, not replace them.

Key takeaway

RUMIGEN shows that gene editing may support animal health and climate adaptation in specific cases, but it is not a shortcut. The real value depends on careful testing, responsible governance and clear benefits for animals, farmers and society.

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.

