

SCIENCE, SUSTAINABILITY AND BREEDING INNOVATION: GERONIMO AND RUMIGEN PROJECTS PRESENTED THEIR LEGACY.

Brussels, Belgium – The Horizon 2020 projects GEroNIMO and RUMIGEN officially concluded in May 2026, after five years of collaborative European research dedicated to advancing sustainable livestock breeding through genomics, epigenomics, and societal acceptance.

GEroNIMO and RUMIGEN respectively addressed genome- and epigenome-enabled breeding strategies in monogastric and ruminant species. Both projects were funded under the European Union’s Horizon 2020 research and innovation programme and ran from June 2021 until May 2026.

The two sister projects joined their forces one last time at the occasion of their public final event “Breeding the Future: Genomics, Epigenomics & Societal Acceptability for Sustainability in Livestock,” held in Brussels on April 15, 2026. The event, gathering researchers, breeders, policymakers, and stakeholders, showcased scientific advances and explored how innovative breeding approaches can contribute to animal welfare, resilience, biodiversity, and sustainable food systems.

Overview of the key scientific results

Among the scientific highlights presented during the final conference was the development of the “RUMIGEN EpiChip,” described as a sensor of environment and breeding practices and later presented as a tool for integrating epigenetics into dairy cow selection¹. Researchers also presented work on including methylation in genomic prediction, selection strategies for heat-stress tolerance, and approaches to maintain and improve local and small breeds².

GEroNIMO researchers presented results integrating omics data³ to better understand the genetic architecture behind efficiency-related traits, as well as research into stress related epigenetic changes in chicken brains and molecular fingerprints linked to pig male reproduction. Additional presentations explored the role of the sperm epigenome in fertility, inheritance, and offspring phenotype.

The projects also addressed future-oriented breeding technologies and their societal implications. Presentations covered stakeholder and public engagement in breeding innovation debates, citizen engagement methodologies, gene editing for livestock improvement,

¹ Epigenetics is how the environment and management leave chemical marks on DNA, influencing which genes are active. This chip reads those marks to help select better-adapted dairy cows.

² Methylation is a chemical “on/off” switch on DNA that affects which genes get used. Including it in predictions helps forecast how animals cope with heat or stress.

³ Omics data is a complete molecular readout of an animal’s biology. It reveals hidden genetic mechanisms driving efficiency, brain function, and reproduction.

management of rare alleles⁴ in breeding schemes, and simulation scenarios for gene editing in dual-purpose chicken breeding programme.

Science meets policy

The final event also provided an opportunity to discuss the future policy framework for innovative breeding technologies in Europe, including gene editing, with the participation of Member of the European Parliament (MEP) Dr. Jessika van Leeuwen. Discussions highlighted that gene editing could become a complementary tool to conventional breeding, particularly for improving animal health and welfare, disease resistance, climate adaptation and production efficiency.

Speakers also noted that while several non-EU countries are already moving forward with enabling frameworks for gene-edited animals, Europe still lacks a clear pathway for livestock applications. The importance of science-based and enabling policies, together with continued dialogue between researchers, breeders and policymakers, becomes therefore essential to support responsible innovation in the livestock sector.

A strong basis for future work

GEroNIMO and RUMIGEN have left an important legacy for European livestock research, leaving a foundation of scientific knowledge, collaborative networks, and practical tools that can support future breeding strategies aimed at resilience, efficiency, and sustainability.

The presentations and replays of the joint final event are available online: <https://rumigen.eu/rumigen-final-conference-presentations/>

The outcomes and results can be consulted on the projects websites:

- GEroNIMO: <https://www.geronimo-h2020.eu/>
- RUMIGEN: <https://rumigen.eu/>

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⁴ *Managing rare alleles keeps the herd's genetic diversity high and inbreeding low.*