

PRESS RELEASE

GEroNIMO Researchers Collaborate to Unravel Biological Mechanisms for Efficient Livestock Production Traits in Pig and Chicken

Researchers from several European institutes and universities have successfully completed the first phase of the GEroNIMO project to unravel the biological mechanisms underpinning Efficient Livestock Production (ELP) traits in pigs and chickens.

The GEroNIMO project, funded by the European Union's Horizon 2020 research and innovation program, aims to develop new strategies for improving livestock production.

What is Efficient Livestock Production (ELP)?

The concept of '**efficient livestock production**' is multi-dimensional, encompassing three main pillars: economy, society and environment.

Within this framework, breeding for efficient livestock production needs to lead to 'all-round' animals by simultaneously targeting traits related to **production (in terms of quantity and quality), efficiency, productive longevity, fertility, resilience, animal welfare and health.**

What is the significance of this research?

The research is significant because it will provide valuable insights into the biological mechanisms that underlie ELP traits. This information will be used to develop new breeding strategies and management practices that can improve the sustainability and efficiency of livestock production.

What did the researchers do?

The researchers collected comprehensive phenotype¹ data on egg, sperm, and meat quality, egg productive longevity, feed efficiency, health, and growth. The data was collected from three animal experiments:

- *Boar semen quality:* Semen traits were assessed using CASA (Computer-Assisted Sperm Analysis), a standardized high-throughput phenotyping method used in artificial insemination stations for routine boar semen evaluation.
- *Laying hen productivity:* Standard chicken phenotypes were recorded at two ages - 70 wk of age (700 animals) and 90 wk of age (500 animals). All animals were individually phenotyped for feed intake, egg quality (albumen, yolk, and shell strength), egg production, body weight, lipid storage and bone composition for a part of animals.
- *Pig growth, feed efficiency, and meat quality:* Phenotype data related to growth and body composition as muscle percentage were extracted from SEGES/Danbred's

¹ All the observable physical characteristics of an organism, including colour, shape, size, biochemical properties and performance, which result from the expression of its genotype in a given environment.



databases from nearly 110 thousand animals. Additionally, data on feed efficiency and feeding behaviour were recorded in 757 boars.

What did the researchers find?

The researchers found that the phenotype data was of high quality and that the animals were well managed. They also found a large amount of variation in the phenotypes, suggesting potential genetic improvement.

What are the next steps?

The researchers are now conducting in-depth combined analyses on the phenotype data, genotypes², epigenotypes³, and transcriptomes⁴ of the animals in the study.

Authors

Sandrine Lagarrigue (Institut Agro, IA-AO) Ole Madsen (WUR), Pedro Sa (WUR), Rodrigo Mezncio Godinho (TNRC), Tatiana Zerjal (INRAE), Thierry Burlot (NOVOGEN), Peter Karlskov-Mortensen (UCPH)

[Read more about the deliverable 1.1 in the report](#)

About GEroNIMO

The GEroNIMO project is a pioneering initiative dedicated to unravelling the mechanisms behind efficient livestock production for sustainable farming. With an unwavering commitment to research and development, the project aims to optimise animal traits, enhance breeding programs, and address environmental challenges to meet the industry's evolving demands.

To learn more about the GEroNIMO project, please visit the official project website at <https://www.geronimo-h2020.eu/>

Contact

Çağla Yüksel Kaya, PhD
Lead Communication and Outreach
European Forum of Farm Animal Breeders - EFFAB
Email: geronimowp6@gmail.com

² The complete set of genes possessed by an organism.

³ While the genotype represents the genetic information encoded in the DNA sequence, the epigenotype involves modifications that can control when and how specific genes are turned on or off

⁴ The complete set of RNA molecules produced by the cells of an organism, providing insights into which genes are active and how they contribute to cellular functions.

