

NeoGiANT: Turning Grape Waste into Sustainable Alternatives to Antibiotics in Animal Production

- *The EU-funded NeoGiANT project demonstrates that natural grape-derived extracts can reduce the need for antibiotics in animal farming, offering a sustainable alternative for livestock, fish-farms and animal reproduction.*
- *By doing so, the project addresses one of the most urgent challenges in food production: tackling antimicrobial resistance (AMR) while maintaining animal health and productivity.*

Galicia, Spain. 19 March 2026.- Successfully, the project developed and tested natural grape-based extracts with antimicrobial and immune-supporting properties. These extracts were evaluated across multiple applications, including livestock and aquaculture feed, animal health treatments and sperm preservation for breeding.

The EU-funded **NeoGiANT Project**, has shown that natural compounds extracted from grape marc can offer a safe and sustainable alternatives to passed antibiotics in animal farming, aquaculture and animal reproductions.

Throughout the project, consortium members developed a wide range of polyphenolic extracts, supported by meticulous physicochemical characterisation and analytical profiling. The research results confirmed that these natural extracts can limit the growth of harmful microorganisms while remaining compatible with animal health. Unlike conventional antibiotics, plant-based therapies may also make it more difficult for bacteria to develop resistance, supporting their long-term effectiveness.

A central achievement of the project was in the field of grape extract production and natural formulations with antimicrobial properties, which established an integrated and scalable production pipeline transforming grape marc into high-value antimicrobial formulations.

Optimised green extraction process using food-grade solvents enabled the recovery of high-polyphenol extracts with strong antioxidant and antimicrobial activity. Those were fully characterized and successfully scaled from laboratory to pre-industrial production, demonstrating robustness and reproducibility.

In parallel, solid and liquid formulations were developed for feed, aquaculture and veterinary and reproductive applications, including spray-dried powders with high bioactive retention and application-specific liquid system.

Stability, physicochemical properties and sterilisation compatibility were rigorously validated, ensuring that all prototypes were suitable for subsequent biological and in vivo evaluation.

“NeoGiANT shows that animal health, sustainability and innovation can go hand in hand,” said the project coordinator. *“One of the project’s main goals is to reduce the reliance on antibiotics by developing solutions that are both effective and environmentally responsible.”*

In the early stages of the project, the consortium faced the challenge of applying EUCAST standards (European Committee on Antimicrobial Susceptibility Testing) guidelines to assess antimicrobial activity, as these guidelines are designed for single-compound antibiotics, while NeoGIANT worked with complex, multi-component natural extracts. Once this approach was successfully adapted, the research progressed smoothly and delivered the expected results.

Feeding in live trial in pigs, cattle and fish, showed that grape extracts can be harmlessly added in animal diets without provoking into gut issues. The healthy gut bacteria were maintained or increased in some cases where the potentially detrimental bacteria were reduced. This explains to positive responses from the animals to the grape polyphenols to support natural disease with no side effects.

Building on these formulations, one of the points of the investigation assessed the antimicrobial grape-based ingredients as feed and drink water supplements across multiple species, including calves, piglets, poultry and several aquaculture species. The trials confirmed the safety of polyphenol supplementation at defined inclusion levels and demonstrated species – and dose – dependent efficacy.

In piglets, supplementation improved gut health parameter, reduced diarrhoea incidence under challenge conditions and supported immune responses and growth performance.

Aquaculture, optimised concentration enhanced antioxidant activity and showed promising trends in disease resilience and feed efficiency.

At the same time, in broilers, drinking water supplementation demonstrated context-dependent benefits, highlighting the importance of dosage and timing. Importantly, the stability of the polyphenolic compounds in feed matrices was confirmed over extended storage periods, supporting their feasibility for practical farming conditions.

NeoGIANT also explored the use of these natural extracts in animal reproduction. Antibiotics are commonly used to preserve semen for artificial insemination. Taking each species necessities, the project successfully developed antibiotic-free sperm preservation formulations for each one. Consortium members open a new possibility for reducing antibiotic use in breeding practices without compromising fertility.

Beyond laboratory research, NeoGIANT also focused on real-world applications. By implementing advanced tools, the project helped move the production process closer to scale-up, while sustainability was assessed from the early stages of development. As a result, the EU-funded project has delivered solutions that are technically feasible, environmentally sound, and ready for further industrial development.

By optimising natural extracts, developing suitable formulations and validating their effects, the project has shown how agricultural by-products can be transformed into practical solutions for animal production. This work highlights the real potential of natural antimicrobial alternatives that can benefit both farmers and the industry.

At the same time, **NeoGiANT** gives a second life to grape by-products from the agri-food sector, contributing to the circular economy while supporting European efforts to reduce antimicrobial resistance. The project's results open the door to new innovations in sustainable animal health.

European Funding

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Project Partners

8 industrial partners, 10 research institutions & universities and 2 non-profit organisations compose the equilibrated **NeoGiANT** consortium encompassing 8 European countries: Belgium, Czech Republic, Spain, Poland, Hungary, United Kingdom, Portugal and Germany, and 1 non-EU country: Argentina.

The partners are: University of Santiago de Compostela (coordinator) (Spain), Moredun Research Institute (United Kingdom), Institute of Agriculture and Food Biotechnology (Poland), Veterinary Research Institute (Czech Republic), Hungarian University of Agriculture and Life Sciences (Hungary), Freie Universität Berlin (Germany), University of Porto – Science Faculty (Portugal), University of La Laguna (Spain), Asociación Española de Normalización (Spain), University of South Bohemia (Czech Republic), National Scientific and Technical Research Council (Argentina), Asociación Agraria de Jóvenes Agricultores (Spain), Anitom S.L (Belgium), i-Grape Laboratory S.L. (Spain), Contactica S.L (Spain), Nutrition Science (Belgium), Cz Vaccines (Spain) Lifebioencapsulation S.L. (Spain), Bianor Biotech (Spain), Magapor S.L. (Spain).

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