SILA®
ADVANCED NUTRITION

NOVAMONT
A Versalis Company



nutrilox®

ADVANCED FEED SOLUTIONS
FOR LIVESTOCK

CUTTING RUMINANTS GREENHOUSE GAS EMISSIONS WITH TWO NOVEL FEED ADDITIVES



NUTRILOX® is an innovative product range developed through the partnership between SILA, a specialist in industrial microencapsulation processes for animal nutrition, and Novamont, an international player in the field of bio-based chemistry. The range combines **short- and medium-chain fatty acids and essential oils** with SILA's microencapsulation technology. The fatty acids are produced at Novamont's biorefinery in Porto Torres (SS, Italy), using proprietary technology that harnesses the molecular complexity of plant-based raw materials. SILA's specific coatings protect the selected ingredients, enhancing their stability and bioavailability while enabling targeted release. This approach supports more precise and sustainable ruminant nutrition, aiming to **reduce methane emission intensity while improving production performance**. NUTRILOX® products for ruminants are validated through in vitro and in vivo studies in collaboration with the Universities of Milan and Bologna.

PROTECTING WHAT MATTERS. NOURISHING WHAT'S NEXT.

IN VITRO TESTING FOR CELL SAFETY AND RUMEN FERMENTATION (UniMI)

The University of Milan evaluated the biological effects and practical viability of encapsulated essential oils and organic acids as feed additives for ruminants. The work addressed three critical areas: compound safety and immunocompatibility, impact on rumen fermentation, and modulation of the microbiome.

Cellular Safety and Immunocompatibility

Analysis of viability and potential apoptosis in peripheral blood mononuclear cells (PBMCs) from healthy Holstein cows proved that the essential oils and organic acids, alone or in combination, used in these two solutions do not compromise bovine immune cell health and support their safety as additives, defining optimized concentration ranges for their application.

Rumen Fermentation & Microbiome Modulation

Data from rumen microbiome revealed that these additives, while reducing methane emissions, particularly in high-concentrate diets, do not alter the main taxonomic structure of the microbiota, indicating that rumen fermentative function is fully preserved. The reduction in CH_4 emissions is not due to a generalized disruption of the microbiome, but rather to a selective functional modulation of methanogenic bacterial populations and the efficient channelling of metabolic hydrogen toward propionate synthesis.

Immunological Safety	Methane Emission Reductions	Microbiome Compatibility
at the cellular level with no cytotoxicity observed.	without compromising dry matter degradability (DMD) or volatile fatty acid production.	preserving the core microbial community while suggesting selective modulation of methanogenic archaea.

PATENT PENDING

IN VIVO PERFORMANCE FOR METHANE MITIGATION & DAIRY EFFICIENCY (UniBO)



nutrilox® GEOLIN™ EB

ENERGY BALANCE

Solution for Methane Reduction, Ruminant Efficiency and Optimized Metabolic Profile

-33.7% Enteric Methane
Significant reduction in daily CH_4 emissions vs. control (up to -36.3% vs. baseline).

-35.5% Emission Intensity
Significant drop in CH_4 emitted (g) per Kg of energy-corrected milk (ECM), supporting improved metabolic efficiency.

+1.48 Kg/Day Milk Yield
Sustained, higher milk production performance throughout the trial.

+65 g/Day Fat & +42 g/Day Protein
Significantly greater milk component mass daily output.

+18.8% pts Fiber Digestibility (24h dNDF):
Increased in vitro fiber degradability at 24 hours, indicating an optimized ration's energy yield.

Reduced Serum & Milk BHB:
Significantly lowered BHB in blood serum and numerical reduction in milk, suggesting an improved energy balance.

Recommended Dosage: 35 - 40 g/head/day (Dairy cows)
15 - 30 g/head/day (Beef cattle)



nutrilox® GEOLIN™ PP

PRODUCTION PERFORMANCE

Solution for Methane Reduction, Lactation Persistency & Immune Support

-33.2% Enteric Methane
Numerical reduction in daily CH_4 emissions.

-36.2% Emission Intensity
Numerical decrease in CH_4 emitted (g) per Kg of energy-corrected milk (ECM), sustaining enhanced metabolic efficiency.

+2.23 Kg/Day Milk Yield
Persistent, superior lactation curve throughout the trial, counteracting the physiological decline.

+68 g/Day Fat & +69 g/Day Protein
Significantly higher milk fat and protein daily output.

-31.4% In Vitro Methane
Reduced methane production in vitro without suppressing fiber degradability at 24 hours.

Reduced Systemic Pro-Inflammatory Markers
Significantly lowered α1-Globulins in blood serum, indicating a reduced acute-phase inflammatory stress.

Recommended Dosage: 80 - 100 g/head/day (Dairy cows)
40 - 50 g/head/day (Beef cattle)

The results presented above were obtained in vivo at the University of Bologna's experimental farm, following a longitudinal experimental design in high producing, healthy dairy cows, and are expressed as treated vs. control group. The sniffer method was used to assess methane emissions.

PATENT PENDING

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For additional information, ask our technical experts.

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