



SIMTR3A



SAPIENZA
UNIVERSITÀ DI ROMA

**8TH INTERNATIONAL CONFERENCE
ON MICROBIAL DIVERSITY
MICROBIAL DIVERSITY FOR EMPOWERING THE
ECOLOGICAL TRANSITION:
RESEARCH, INNOVATION, AND TECHNOLOGICAL TRANSFER**

**23-26 September 2025
Rome, Italy**

**Book of
Abstract**



Grape stalks and olive pomace by-products in sustainable cows feeding: evidence from *in-vitro* rumen fermentation

¹Mancini Andrea, ¹Dallavalle Giulia, ²Khiaosa-ard Ratchaneewan, ²Zebeli Qendrim,
¹Franciosi Elena

¹Edmund Mach Foundation, Italy; ²University of Veterinary Medicine, Austria

Corresponding author: andrea.mancini@fmach.it

The agri-food system in Trentino includes significant wine and olive oil production. A promising opportunity for circularity lies in the reuse of grape stalks (GS) and olive pomace (OP) as feed supplements for dairy cows. Recent studies have shown that daily supplementation with GS and OP can enhance milk nutritional quality without compromising milk yield. Their high content of phenolic compounds, residual oils, and tannins may also positively influence rumen microbial communities. This study aimed to evaluate the effects of GS and OP on rumen microbiota modulation and methane (CH₄) emissions reduction using the in-vitro Rumen Simulation Technique (RUSITEC). Six diets were tested: a control (CTRL); grapeseed meal (GSM) at 8%; grape stalks from Lagrein (GSL), Cabernet Sauvignon (GSCS), and Merlot (GSM) at 8%; and olive pomace (OP) at 4% (all percentages on a dry matter basis). Two RUSITEC systems with six bioreactors each were used across three experimental runs (n = 6 per diet) and samples were collected over 5 days for analysis of fermentation parameters. No significant differences were observed between the CTRL and by-product diets in terms of pH, or protozoa counts, albeit redox potential was increased by OP compared to CTRL. Mean gas composition ranged from 14.0–15.8% for CH₄, 76–78% for CO₂, and 0.07–0.09% for H₂. A potential effect on reduced ammonia production was observed in GSCS (P<0.05), followed by GSL and OP diets (P<0.10) compared to CTRL, despite the similar crude protein degradation. Among volatile fatty acids, caproate was the most affected being decreased by several by-product diets, suggesting a shift in microbial activity, which will be further investigated using Illumina MiSeq sequencing. The data collected show promising trends in the use of agri-food by-products in sustainable ruminant feeding systems. Ongoing research will further explore these results assessing their practical applicability.