



First name/Surname: Gabriele Giannotta

Telephone: +39 3926912868

E-mail: gabriele.giannotta.unipd.it

Nationality: Italy

Date of birth: 20/09/1995

Place of birth: Catania, Italy

---

#### Education:

- PhD student in Animal and Food Science (2025- )
- Master student in Biotecnologie per l'alimentazione (2018-2020)
- Bachelor student in Scienze e tecnologie alimentari (2014-2018)

#### Research areas:

- Transcriptomics
- Epigenomics
- Animal (cow)
- Genetics

#### Brief description of Ph.D project:

“Omics Approaches to Investigate Metabolic Dysfunctions in Dairy Cows”

The PhD thesis will focus on the investigation of metabolic dysfunctions in high-yielding dairy cows through a multi-omics framework. The project will integrate phenotypic and metabolic data with microbiome and transcriptomic profiles from key biological matrices (e.g., milk and blood) collected at different times along

the transition period. Differential gene expression and pathway analyses will be combined with biochemical indicators (e.g.  $\beta$ -hydroxybutyrate and NEFA; immune and oxidative stress biomarkers) and microbial composition to elucidate the metabolic and inflammatory responses associated with these major metabolic dysfunctions. Integrative network analyses will be employed to identify molecular signatures linked to cows' susceptibility and adaptive capacity to metabolic imbalances. The outcomes will contribute to a better understanding of metabolic resilience and support the development of early-stage biomarkers for precision dairy management.

The experimental activity will be conducted on Holstein cows during the transition period, when the risk of both subacute ruminal acidosis (SARA) and ketosis is the highest. Animals will be monitored for ruminal and metabolic parameters through continuous pH measurement, milk yield recording, and periodic blood sampling for biochemical analyses ( $\beta$ -hydroxybutyrate, NEFA, glucose, liver enzymes, and inflammatory markers). Based on these data, animals will be selected for transcriptomic analyses (RNA-seq) and microbiome analyses (16s rRNA sequencing) which will be performed on selected biological matrices (blood and milk) collected at defined time points before and after calving. Different integrative approaches will be tested to identify key molecular mechanisms involved in metabolic adaptation. Cross-layer correlations among omics datasets will be explored to identify biomarkers of disease susceptibility and resilience. By jointly evaluating phenotypic data and transcriptomic and microbiome signatures, the project will provide a comprehensive overview of the molecular responses associated with SARA and ketosis, offering novel insights into metabolic health in dairy cows.

Supervisor:

Prof.ssa Sara Pegolo

Publications: [Google scholar link](#)