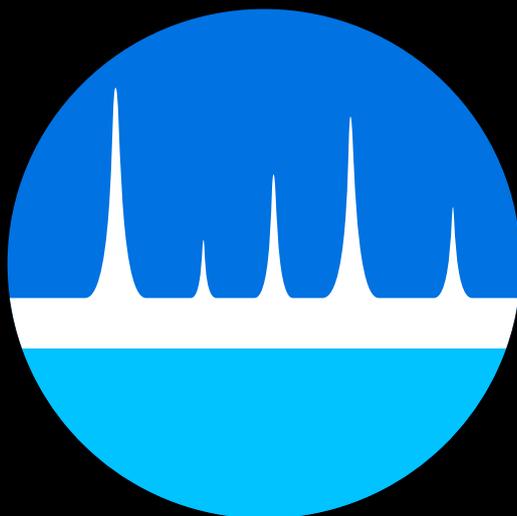


CONGRESSO LATINO-AMERICANO DE CROMATOGRAFIA E TÉCNICAS RELACIONADAS

**Campos do  
Jordão, Brasil**

**28-31, Outubro  
2025**



**COLACRO XX  
(2025)**

**LIVRO DE RESUMOS  
*BOOK OF ABSTRACTS***

# Fecal Lipid Profiling Using UPLC-qTOF-MS to Identify Biomarkers of Cattle Phenotype

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Ultra-performance liquid chromatography coupled with high-resolution accurate mass spectrometry (UPLC-QqTOF-MS) is a cornerstone in lipidomics, enabling large-scale lipid profiling and biomarker discovery related to disease, diet, and phenotype. In this study, we employ two high-resolution UPLC-MS/MS acquisition strategies—data-dependent acquisition (DDA; Full-MS and Auto-MS2) and data-independent acquisition (DIA; bbCID MS/MS2)—on a UPLC-VIP-HESI-QqTOF system (Bruker Impact II Target Screener). Fecal samples were collected from 93 Nelore bulls (18–30 months old) participating in the PNAT 2020 (National Young Sires Evaluation Test, ABCZ, Brazil). Samples were obtained directly from the rectal ampulla, flash-frozen in liquid nitrogen, and stored at -80 °C. Lipid extraction was performed from 50 mg of feces using a commercial cell disruptor (FastPrep, MPBio; matrix type D) with 1.75 mL of methyl tert-butyl ether (MTBE)/methanol/water (1:0.25:0.5, v/v/v). After ultracentrifugation, the organic phase was collected, dried in a vacuum centrifugal evaporator (Savant Speedvac), and reconstituted in 1 mL of UPLC mobile phase B (isopropanol/acetonitrile, 90:10 v/v). Analyses were conducted in positive ionization mode under both DDA and DIA conditions. Quality control samples were prepared by pooling daily sample batches and spiking with an internal standard (16:0-18:1 D5 PG, CAS 1246298-34-9). Data processing and ion annotation are being performed with MS-DIAL (v4.92) and MS-FINDER (v3.52). Multivariate statistical analysis (PCA) revealed two distinct sample clusters, with annotated lipids identified as key discriminating features. Relevant lipid biomarkers were further integrated with characteristic phenotypic markers using the mixOmics R package, providing insights into their associations with performance and feed efficiency. This study advances the characterization of ruminal bacterial lipid metabolites and their potential role as biomarkers in cattle phenotype.

**Acknowledgements:** FAPESP, CAPES, and CNPq.