

## Metabolomics of Amasi Traditionally Produced from Cow and Goat Milk as Revealed by GCMS and LCMS. The Impact of Storage Time, Lactic Acid Bacteria, and Health Benefits

Betty Ajibade<sup>1</sup>, Titilayo Ajayeoba<sup>1</sup>, Saheed Sabiu<sup>1</sup>, Konstantin Moiseenko<sup>2</sup>, Tatyana Fedorova<sup>2</sup>, Oluwatosin Ijabadeniyi<sup>1</sup>

<sup>1</sup>Durban University of Technology, Durban, South Africa. <sup>2</sup>A.N. Bach Institute of Biochemistry, Research Center of Biotechnology, Moscow, Russian Federation

### Abstract

Amasi, traditional fermented milk produced in Southern Africa, is associated with several health benefits, such as probiotic activities, immune system modulation, as well as antimicrobial, antitumor, and antioxidant activity. These benefits are closely related to the produced metabolites during fermentation. This study presented the metabolites profile of raw Amasi cow milk (ACM) and raw Amasi goat milk (AGM) using the versatile Liquid chromatography-mass spectrometry (LC-MS) and the smooth Gas chromatography-mass spectrometry (GC-MS) spectrophotometric methods for complete profiling of the metabolites. Samples were drawn from both raw cow and goat milk and from the fermented milk at 0h, 7h, 48h, and 96h, and the metabolites were categorized based on their pathways. Data obtained were classified into compound groups such as acids, alcohols, cyclic compounds, esters, ketones, phytosterols, vitamins, and many others, and their characteristics such as the retention time, observed mass, molecular formula, and mean peak areas were reported. The results showed a significant increase ( $p \leq 0.05$ ) in the metabolites produced by ACM compared to AGM in terms of the mass observed, the same trend was noticed in the raw cow milk (RCM) compared to raw goat milk (RGM). The immune and drug pathways were significantly increased for both ACM and AGM and generally, RCM has more metabolites compared to RGM in terms of observed mass. Metabolite increase was noticed as the time of fermentation increased for both ACM and AGM. These data represent the collection of metabolites in ACM and AGM and may be useful for the identification and utilization of functional compounds, molecular docking, and invitro studies in foods-related drug discovery analysis.