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6O06: Identification of mountain food products' signature through different spectroscopic techniques

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Food producers that operate in mountain areas, despite the high quality of their products, struggle in competing on the market due to the difficult production conditions related to the landscape. For this reason, European Community has defined a quality label, called "Mountain Product", in a regulation reserved for food products produced and processed in mountain areas, with the aim to support the economy in underprivileged areas [1]. Among others, Parmigiano Reggiano cheese, one of the most renowned Italian food product with a PDO (Protected Designation of Origin) label, has a vast part of production that takes place in mountain areas. The MOUNTAIN-ID research project (<https://www.mountainid.unimore.it>), to which the current work is related, has the main objective of developing analytical methodologies to conjugate identity, sustainability, and value for some mountain products. In fact, the "Mountain Product" label is not yet popular among consumers, which is why there is an interest by food producers to promote these products as well as to protect their authenticity. The present work aims to correctly detect and classify, among different Parmigiano Reggiano samples, the ones characterized by the mountain denomination as well as additional requisites as established by the producer consortium [2], i.e. "Prodotto di Montagna - Progetto Territorio Consorzio" ("Quality Project - Mountain Product"). To this aim, different spectroscopic techniques, namely ¹H-NMR, NIR and Raman, were coupled with chemometric tools, such as data fusion, variable selection and classification techniques.