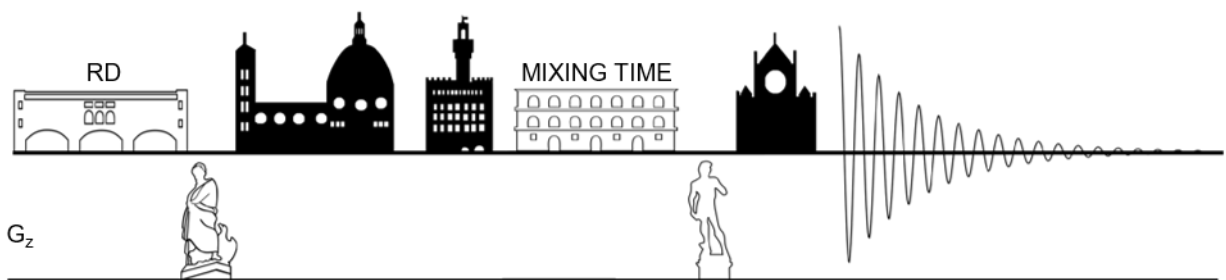


51st National Congress on Magnetic Resonance



September 4-6, 2024 | Florence

Building D4, University of Florence, Via delle Pandette 35, Florence

GIDRM
GRUPPO ITALIANO
DISCUSSIONE RISONANZE MAGNETICHE



UNIVERSITÀ
DEGLI STUDI
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Da un secolo, oltre.

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GENERAL INFORMATION

VENUE

Building D4 - Polo di Novoli
University of Florence
Via delle Pandette 35, 50127, Firenze

INVITED SPEAKERS

The following speakers have agreed to give plenary lectures at the meeting:

Maria Rosaria “Sasi” Conte - *King’s College London*

Dominik Kubicki - *University of Birmingham*

Mathilde Hauge Lerche - *Technical University of Denmark*

Claudio Luchinat - *University of Florence*

Alceo Macchioni - *University of Perugia*

Roberto Fattorusso, Winner of the GIDRM/GIRM Gold Medal 2024 –
University of Campania Luigi Vanvitelli

The following keynote speakers have agreed to give lectures at the meeting:

Cristina Airoidi - *University of Milan Bicocca*

Francesca Cantini - *University of Florence*

Angelo Gallo - *University of Turin*

Cinzia Ingallina - *University of Rome La Sapienza*

Marilisa Leone - *CNR-IBB, Naples*

Alfonso Pedone - *University of Modena e Reggio Emilia*

Gabriele Stevanato - *University of Padua*

Claudia Testa - *University of Bologna*

POSTER SESSIONS

Poster session 1

Wednesday, September 4th, 16:05-17:00, ODD abstract numbers

Poster session 2

Thursday, September 5th, 10:30-11:20, EVEN abstract numbers

Poster session 3

Thursday, September 5th, 12:50-14:10, ODD abstract numbers

Poster session 4

Thursday, September 5th, 16:10-17:30, EVEN abstract numbers

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**Società
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Gruppo Interdivisionale di
Risonanze Magnetiche

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USE OF NUCLEAR MAGNETIC RESONANCE IN CHEESE ANALYSIS

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Keywords: solution NMR, biomolecules, metabolomics, food.

NMR spectroscopy has been long used for the analysis of cheese products, starting from the simple moisture determination in the 1960s and 70s [1,2] but the more in-depth studies of these matrices using high resolution magnets have started only at the dawn of the 21st century [3], and remains a pertinent field of interest up to the present day [4]. Recently, our research group has applied this approach in several case studies. The first one consisted in nutritional value study of cheeses enriched with blackcurrant and Cornelian Cherry. Here, the targeted NMR results indicate that it is possible to differ the blackcurrant-modified cheeses (that turned out to possess increased bioactive potential) from the others [5]. Another one was the dataset comprising two Italian PDO cheeses and several competitor varieties. Both aqueous and chloroform extracts demonstrated that after the statistical analysis (Random Forest approach) the PDO cheese can be discriminated from others with 92-93% predictivity [6,7]

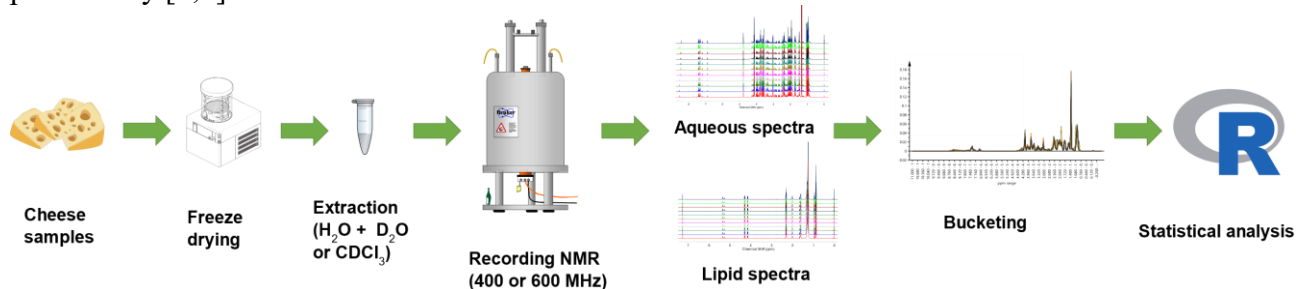


Fig. 1. Experimental workflow of cheese analysis.

In each case study the experiment design (Fig. 1) consisted of freeze drying the grated cheese followed by extraction of the residue either with water or chloroform to obtain aqueous and lipid fractions, recording proton NMR spectra for each fraction with subsequent post-processing, binning and statistical analysis using specified packages in R programming language environment as well as measurement of concentrations for individual components. Thus, NMR spectroscopic analysis of cheeses has been shown to be a promising technique in detection of mislabeling and nutrition studies.

References

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- [4] M. Tarapoulouzi, I. Pashalidis and C. R. Theocharis *Appl. Sci.* **14**, 6, 2584 (2024)
- [5] J. Andersen et al. *Front. Nutr.* **9**, 1023490 (2023)
- [6] V. Maestrello et al. *Foods* **13**, 3, 358 (2024)
- [7] V. Maestrello et al. *Submitted manuscript* (2024)