

Editorial

# Special Issue “Nuclear Magnetic Resonance (NMR) Spectroscopy in Food Science and Processing”

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The application of Nuclear Magnetic Resonance in food science has grown exponentially over the past few decades. NMR offers a wide spectrum of possibilities for examining important aspects of complex food matrixes ranging from their composition at the molecular level to the overall structure and dynamics of food matrix texture and morphology. NMR has shown to be an adequate instrument suitable to cope with food matrix complexity, which can be studied by NMR as it is without reduction to simpler but no more adequate models. Time domain NMR and MRI are completely noninvasive methods, whereas high-resolution NMR spectroscopy requires minimal sample manipulation.

This Special Issue aimed to collect and present recent developments in the use of Nuclear Magnetic Resonance in food science and food processing, including different NMR methodologies (High Resolution Nuclear Magnetic Resonance Spectroscopy, MRI and Time domain NMR)

A total of five research papers in various fields of food science, including food chemistry, food traceability, metabolomics, quality control, chemometrics and food adulteration analysis, are presented in this Special Issue. Ingallina et al. [1] reported <sup>1</sup>H NMR-metabolomics of several Italian tomato fruit cultivars as a method for their chemical characterization and utilized comparative analysis to point out the similarities and differences among cultivars. Baek et al. [2] have studied tomato fruits’ maturity changes using entirely noninvasive Magnetic Resonance Imaging methodology applied to intact cherry tomato fruits. They reported that internal structural changes observed in the pericarp region of the tomato fruit were highly correlated with fruit maturity. Rotondo et al. [3] proposed a method for chemical characterization of the pistachios fruits based on a combination of <sup>1</sup>H NMR spectroscopy of extracts and the innovative multi-assignment recovered analysis of NMR data for robust quantification of identified compounds. This method was applied for the geographical origin discrimination of pistachios. Spano et al. [4] developed a multi-methodological approach to the characterization of hemp seed oil based on a combination of conventional (spectrophotometric assays) and innovative (<sup>1</sup>H NMR metabolite profiling) methods. Mengucci et al. [5] investigated adulteration that occurs during the production process of “Mozzarella di Bufala Campana”, an Italian cheese with a Protected Designation of Origin status. The suggested method capable to reveal the adulteration is based on time domain NMR relaxometry and the chemometrics analysis of raw relaxation data.

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