



Università di Foggia

4th MS-food Day



October, 07–09, 2015
Foggia - Italy

BOOK OF ABSTRACTS



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PROCEEDINGS OF THE 4th MS FOOD DAY

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**OR18 - STABLE ISOTOPE ANALYSIS FOR AUTHENTICITY
TESTING OF ITALIAN ORGANIC PASTA: VARIATIONS IN $\delta^2\text{H}$,
 $\delta^{13}\text{C}$, $\delta^{15}\text{N}$, $\delta^{18}\text{O}$ AND $\delta^{34}\text{S}$ ALONG THE PRODUCTION CHAIN**

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The variability of stable isotope ratios ($\delta^2\text{H}$, $\delta^{13}\text{C}$, $\delta^{15}\text{N}$, $\delta^{18}\text{O}$ and $\delta^{34}\text{S}$) along the production chain of pasta (durum wheat, flour, pasta) was investigated. The study considered foodstuffs produced both in conventional and organic farming systems in four Italian production regions (Basilicata, Tuscany, Molise and Emilia Romagna) during two growth seasons. The aim was to evaluate if and how the agricultural production method as well as the geographical origin could affect stable isotope ratios determined along the production chain. The ratios of $^{13}\text{C}/^{12}\text{C}$, $^{15}\text{N}/^{14}\text{N}$, $^{18}\text{O}/^{16}\text{O}$, $^2\text{H}/^1\text{H}$, $^{34}\text{S}/^{32}\text{S}$ were measured by Isotope Ratio Mass Spectrometry. By applying linear discriminant analysis on all these parameters a good discrimination between products considering regions, and agricultural production method was achieved. Irrespective of the processing technology, a mean of around 85% of the samples were correctly classified in cross-validation into the organic - conventional group within the region and 98% of the samples in the correct geographical group irrespective of the agricultural regime. The use of these parameters will allow the development of analytical control procedures that can be used to check the geographical provenance of Italian organic and conventional pasta and raw materials used for its production. The parameters considered here were less effective in discriminating the agricultural production methods (conventional vs. organic). However the model applied to a series of organic and conventional test samples resulted in more satisfying results than expected (one error on 15 samples). These first results, lay the foundation for understanding if and how stable isotope ratios could be used for tracing the production method as well as the geographical origin along the production chain of pasta.



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