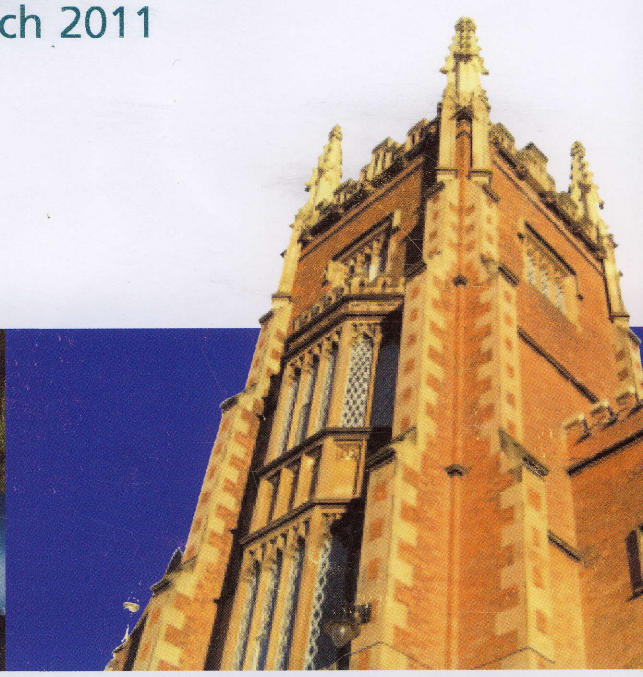
Queen's University Belfast

safefood

ASSET
Assured, Safe, and Traceable

FOOD INTEGRITY AND TRACEABILITY CONFERENCE

Queen's University Belfast 21-24 March 2011



CONFERENCE PROGRAMME AND ABSTRACTS

ORGANISING COMMITTEE

Chair: Chris ELLIOTT

Members:

Edel CASEY

Andrew CASTLES

Donna CONVERY

Terry FODEY

Mark MOONEY

Antony POTTER

Clare REDSHAW

Luc ROCK

Angela SEATON

Joyce WATTERSON

INTERNATIONAL SCIENTIFIC COMMITTEE

Paul BRERETON United Kingdom

Padraig BURKE Ireland

Andrew CANNAVAN Austria

Martin DANAHER Ireland

Chris ELLIOTT United Kingdom

James LINDSAY United States

James MCINTOSH Ireland

Queen's University Belfast

safefood

ASSET
Assured, Safe, and Traceable

16.20 - 16.40

Stable isotope ratio and trace element composition for tracing the origin of dairy products

Dr Federica Camin
Instituto Agrario San Michele all'Adige, Fondazione Edmund Mach

Roberto Larcher (FEM-IASMA)

We have reviewed the literature on the application of stable isotope ratio analysis using Isotope Ratio Mass Spectrometry and elemental composition analysis using mainly ICP techniques for tracing the origin of dairy products. Animal diet composition (e.g. the presence of maize or leguminous plants), the geographical and climatic characteristics of the provenance area, geology, pedology and dairy manufacturing technology are the main variability factors influencing these analytical parameters. By combining the stable isotope ratios of H, C, N, O and S and the mineral content of milk and cheeses using multivariate statistical techniques, it is possible to create models able to distinguish important PDO cheeses, such as Parmigiano Reggiano and Grana Padano from their principal competitors. These models can be used as an official tool to check the authenticity of commercial grated cheeses in order to protect them from mislabelling.

16.40 - 17.00

Elemental profile coupled to stable isotope analysis and chemometrics. A powerful tool to assess the geographical origin of Argentinean beef

Prof Daniel Wunderlin
UNC-Universidad Nacional de Córdoba, Argentina

The control of food provenance is an important topic for food quality and safety and for consumer confidence. In particular, the trade of cattle products such as beef and dairy products has recently been more strictly controlled due to concerns relating to BSE (bovine spongiform encephalopathy). In this work we report the use of combined multi-element isotope (13C, 34S, 15N, 87Sr/86Sr) and trace element analysis to determine the geographical origin of Argentinean beef. We sought to correlate geology of the region where it grows cattle with the chemical composition of meat from these regions. Beef, soil and water samples originating from the major cattle producing regions of Argentina were analyzed within the FP6-TRACE project. Multi-elemental profile was combined with the stable isotope data and submitted to multivariate analysis. Seventeen key variables (Rb, Se, Mn, Mo, Ca, Na, B, K, Mg, K/Rb, Ca/Sr, 34S, 15N and 87Sr/86Sr) were identified by lineal discriminant analysis as providing the maximum discrimination between beef samples on the basis of geographical areas. Generalized procrustes and Canonical analyses showed good correlation between soil, water and beef elemental profiles. We conclude that the analysis of mineral profile in beef, along with the use of chemometrics, provide with a powerful tool for geographical classification of beef. Furthermore, we could demonstrate the influence of elemental profile from soil and water in the elemental composition of beef.