

Data-Driven Multi-analytical Characterisation of PDO and High-Value Food Products

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Focus: PDO Halloumi authentication

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Why PDO Authentication Matters

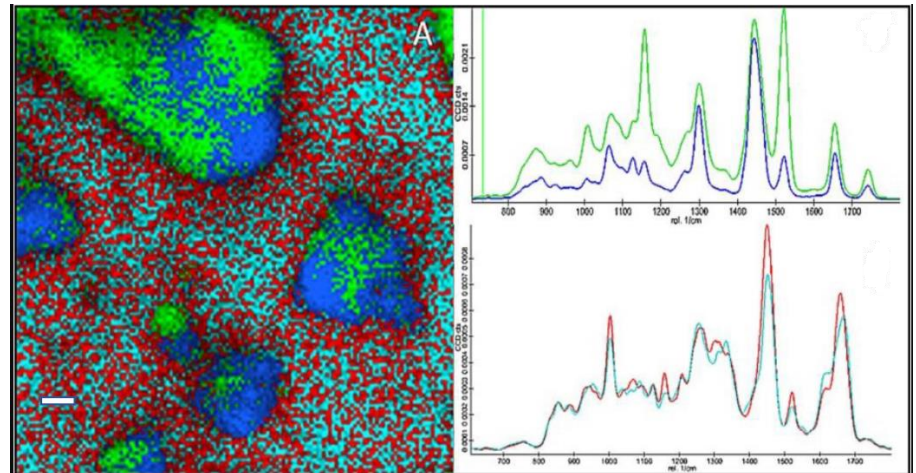
- ✓ PDO products are vital for local culture and economy
- ✓ Cyprus Halloumi PDO requires strict milk-origin compliance
- ✓ Food fraud threatens trust and impacts market value

Tarapoulouzi, M., Artemi, A., and Agriopoulou, S. (2024). Quality Schemes and Geographical Indicators in the Cheese Agribusiness and the Case of the Cypriot Traditional Cheese Halloumi. In *Agribusiness Innovation and Contextual Evolution, Volume I: Strategic, Managerial and Marketing Advancements*, 155-182. Cham: Springer International Publishing.

Current Analytical Approaches

Spectroscopic techniques were applied to PDO-Halloumi samples:

- ✓ FTIR
 - ✓ NIR
 - ✓ HIS
 - ✓ $^1\text{H-NMR}$
 - ✓ Raman Spectroscopy &
 - ✓ Micro-imaging
- Combined with chemometrics



Specific project idea

- Multi-analytical methodology for PDO food products
 - Multiple PDO foods
 - Multiple modalities
- Integrated data-fusion chemometric models
 - Spectroscopic data sharing with international partners
- Reciprocal access to analytical facilities
- Alignment with EU food authenticity priorities
 - Reliable adulteration detection
 - Enhanced traceability & transparency
- Start with dairy products
 - Extend to other PDO foods

Role of partner(s)

- Partners can be
 - Research organizations
 - Commercial entities (analytical & food production)
 - Regulatory (PDO compliance)
- Partners and collaborators will be invited to analyse Halloumi samples using their own instrumentation and methodologies that are not available in our laboratory/university.
- Partners will provide PDO foods for analysis using Raman spectroscopy and imaging in Cyprus.

Previous scientific & technological expertise

IsoDataBase – €968,000,000

Enhancement of the isotopic database of traditional Cypriot products by developing a Blockchain platform to ensure their identity

SERAFINA – €500,000

Surface-enhanced Raman spectroscopy for detection and quantification of Acrylamide in Food

MYRSINE – €500,000

Microscopy and Raman Spectroscopy Imaging Center for Nanoscience and Engineering

