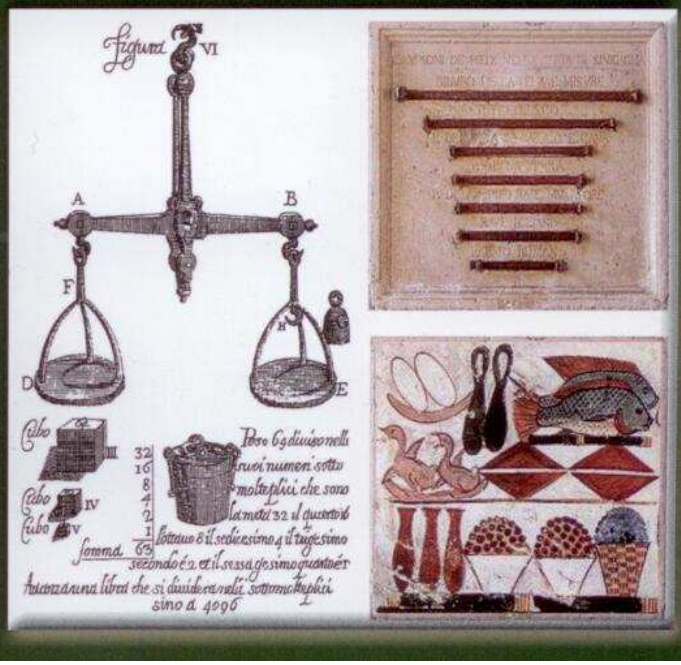
ABSTRACT BOOK

1st IMEKO FOODS

International Conference

1st IMEKOFOODS
Metrology Promoting Objective and Measurable Food Quality and Safety

October, 12nd - 15 nd 2014
Rome (Italy)



IMEKO
INTERNATIONAL MEASUREMENT CONFEDERATION
TC23 "Metrology in Food and Nutrition

ENEA
Italian National Agency for New Technologies, Energy and Sustainable Economic Development

Combination of sugar analysis and stable isotope ratio mass spectrometry to detect the use of non-grape sugars in must of balsamic vinegar

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The 'aceto balsamico di Modena IGP' (ABM) is a PGI (Protected Geographical Indication) vinegar obtained from cooked and/or concentrated grape must (at least 20% of the volume), with the addition of at least 10 % of wine vinegar and a maximum 2% of caramel for color stability (EU Reg. 583/2009). This product could be counterfeited not only in its acetic fraction (e.g. by addition of acetic acids obtained from petroleum derivatives) but also in the must fraction by adding exogenous sugars mix (e.g. from beet or cane). In the case of grape must, fraudulent addition of cane and beet sugars has been detected since 1991 by analyzing the isotopic ratios of hydrogen (D/H) and carbon ($^{13}C/^{12}C$) in ethanol. High Performance Liquid Chromatography with Pulse Amperometric Detection (HPLC-PAD) represents an efficient method for the analytical profiling of minor sugars.

The aim of this work was to investigate whether the HPLC-PAD technique for sugar dosage (sucrose and maltose) is useful as low-cost and time-saving screening of the authenticity of ABM. Different samples of ABMs added with growing percentage of beet, cane and maltose syrup were set up and analysed. A specific experiment to evaluate possible degradation of the added sugar during the shelf time was conducted. Moreover 20 samples of commercial samples of ABMs were taken into account to have a picture of the market.

The results showed that maltose unlike sucrose is stable along the time and for maltose a concentration higher than 0.5 g/kg indicates a presence of non-grape sugars in must.