

**Title:****Comparison of different extraction methods of soybean DNA from refined vegetable oils****Authors & affiliations:**

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**Abstract:** (Your abstract must use **Normal style** and must fit in this box. Your abstract should be no longer than 300 words. The box will 'expand' over 2 pages as you add text/diagrams into it.)

Soybean is the most important genetically modified crop in the world, comprising almost 60% of the biotechnological planted area. The doubts raised by the use of genetically modified organisms (GMO) lead to the compulsory labelling for food products containing more than 0.9% of authorised GMO in the EU. The analysis of DNA coupled with polymerase chain reaction (PCR) has been the technique of choice to monitor the presence of GMO in food.

Since the approval of Roundup Ready soybean in Europe, the production of soybean oil using GM seeds has been increasing. Although several reports show the possibility of detecting DNA in crude vegetable oils, due to the chemical treatments and high temperatures used along refining, detection of DNA in refined oils is very difficult to accomplish. In this work, four methods, namely CTAB, Wizard, Nucleospin<sup>®</sup> food kit for food and the Wizard<sup>®</sup> Magnetic DNA purification system for food, were tested for soybean DNA extraction in commercial vegetable oils, based on previous work testing several soybean food matrices [1]. The DNA extracts were evaluated for their amplifiability by PCR targeting the lectin gene as a marker for soybean.

The results showed that the Wizard<sup>®</sup> Magnetic kit did not allow the detection of amplifiable DNA. Negative results were also obtained using the Wizard method after the pre-concentration by centrifuging 200 g of refined oil. The CTAB method using the same pre-concentrated step allowed the detection of DNA traces in some of the samples tested. The same amount of oil extracted with the Nucleospin<sup>®</sup> kit, allowed the extraction of amplifiable soybean DNA from all tested samples labelled as containing soybean oil. This result showed that the Nucleospin food kit can be successfully used for DNA extraction from refined oils, enabling the detection of GMO in these products.

[1] Mafra, I; Silva, S. A.; Moreira, E. J. M. O.; Silva, C. S. F.; Oliveira, M. B. P. P.; (2008). Comparative study of DNA extraction methods for soybean derived food products, *Food Control*, 19:1183-1190.

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body. In Taiwan, the HEALTH FOOD CONTROL ACT Promulgated on February 3, 1999 by Department of Health, Executive Yuan. This Act is enacted to enhance the management and supervision of matters relating to health food, protect the health of the people of the republic and safeguard the rights and interests of consumers. For the purposes of this Act, the term "health food" shall denote food with specific nutrient or specific health care effects as specially labeled or advertised, not food aimed at treating or remedying human diseases. The product registration after permit is issued around 120 items on July, 2008. Overall, the functional food market in Taiwan is estimated over US\$ 600 million this year, and the ratio of imported products is shared around 70%. Due to the growing awareness of health, food companies as well as government, around the world including the fast coming area: european union, Canada, and Australia have recognized a rapidly developing new market of biologically functional food. Taiwan's academia, government, and industry have real practice and experience for years, hereby also dedicated a substantial fund into the research and public promotion of these products. This report will present the case of Taiwan, regarding to the latest trends and new chances of functional food and also the R&D and innovative incubation in related fields in National Taiwan Ocean University would be introduced.

Keywords: Regulation, Health food, Nutraceutical, Taiwan

[P053]

### **The Determinants of the Price of Wheat from a Global Perspective**

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Recent increases in food prices are increasingly linked to increasing oil prices or the demand for bio-energy. The classic determinant of prices is the changes in supply and demand. The demand for grains for food and animal feed has been on the increase due among others to increasing income. For the supply side, it is recently suggested that stagnant agricultural productivity growth, prolonged drought as well as low stock accounts for the increase in grain prices. Evidence of countries in South America imposing export restrictions cereals resulted in further increases in prices. The International Food Policy Research Institute in recent policy brief suggested that rising expectations, speculation and hoarding have more than expected contributed to the volatility of grain prices. The price of wheat is among those that are very volatile but predictions and explanations are less well documented compared to the significant turbulence the high prices create. The urge for political intervention to avoid excessive grain and food crises in the future will necessitate a better understanding of the entire market complex. This paper examines how the global price of wheat grain is specifically determined by the area cultivated, yield, consumption and stock using global time series data and econometric methods of analysis. Due to the inter linkages between these variables, their level of cointegration is first determined. Regression analysis is then used to ascertain the role of these variables in predicting the price of wheat. Indirectly, the impact of increasing oil prices and the demand for bio-energy on wheat prices is assessed.

Keywords: Food policy, Global, Wheat price

[P054]

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Keywords: DNA extraction methods, refined vegetable oils, Genetically Modified Organisms , Soybean oil

#### [P055]

#### **Market survey on Portuguese beverages with high intense sweeteners**

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Sweeteners are an important class of food additives, used in an increasingly wide range of products. The list of authorized sweeteners is regularly revised by the European Commission but, to ensure proper complying of existing legislation, each EU Member States must establish a system of national surveys to monitor sweetener consumption. These surveys are not yet implemented in Portugal, despite the increasing offer of artificially sweetened food products, specially beverages and yogurts.

The objective of the present work was to evaluate if the intense sweeteners used in beverages sold in the Portuguese market (carbonated and non-carbonated) are within the EU guidelines. To accomplish this objective a market survey was performed in order to identify all the beverages with sweeteners declared in the ingredients list. A total of 60 samples was collected, including only one flavour from each brand, and analyzed for label compliance and sweeteners amount.

The samples were analyzed by SPE/HPLC/ELSD for nine high intensity (non-nutritive) sweeteners, six approved (acesulfame-K, aspartame, cyclamic acid, saccharin, sucralose, neohesperidine dihydrochalcone) and three non-authorized (alitame, dulcin and neotame).

Aspartame was the most frequently reported additive (65% of the samples), followed by acesulfame-K (53%), cyclamates and saccharine (38% each), being sucralose and neohesperidine dihydrochalcone declared in only two samples each. Only approved sweeteners were found and all used within EU maximum concentration limit. Nevertheless, cyclamic acid was frequently at the border line. Several irregularities were found in the labels, including the presence of additional undeclared sweeteners and the use of different strategies to reduce the perception of their presence by the unaware consumers. Also, an increasing number of non-carbonated juice brands, traditionally consumed by children, are developing substitute formulas with sweeteners, not easily perceived on the label.