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# 11ᵀᴴ European Nutrition and Dietetics Conference

### June 29-July 01, 2017   Madrid, Spain

## *In vitro* effects of coffee polyphenol on intracellular oxidant/antioxidant balance of hepatocytes

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**Introduction**: The aim of this study was to evaluate the cytoprotective effect of chlorogenic acid (CGA) the most important coffee polyphenol against rat hepatocytes oxidative injury induced by $H_2O_2$ free radical generator *in vitro.*

**Material & Methods**: Hepatocytes were isolated from liver obtained from Wistar rats and were cultured in RPMI medium at 37°C in a 5% CO2 humidified atmosphere for 48 h, in the presence or the absence of chlorogenic acid at two concentrations (10 and 50 μM). Proliferation index, LDH release, oxidative balance (catalase, reduced glutathione, malondialdehyde, and carbonyl proteins), and the presence of micronucleus were investigated with biochemical methods.

**Results**: The results showed that free radical generators induced a significant decrease in hepatocyte proliferation and in glutathion contents and catalase activity, a significant increase in LDH release with changes in malondialdehyde, carbonyl proteins and micronucleus contents. CGA supplementation enhanced hepatocyte proliferation and reduced the degree of cell membrane injury and intracellular oxidative stress. Hepatocytes pre-treated with CGA were more resistant to the free radical damages. The higher dose of CGA was more potent for reducing intracellular oxidative stress and also for preventing it.

**Conclusion**: In conclusion, our observations provide evidence that CGA had beneficial effects on liver function by correcting and also by preventing oxidative stress.

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## How much is enough? - Evidence based stochastic optimisation of Hungarian nutrition structure

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**Background**: The prevalence of obesity among the Hungarian adult population is one of the highest in Europe, being one of the main factors of mortality.

**Motivation**: A frequent counter-argument in framework of debates on modification of nutrition structure of population is the high cost of changing to more "healthier" nutritional pattern. This is an extremely important problem in a middle-income country, where the food-related expenses are as high as 40% of disposable income of households. Our goal has been to determine the characteristic features of current nutrition structure, cost of it, and the cost of optimized nutrition structure.

**Methodology**: In framework of a preliminary study of a national-wide survey, face-to-face interviews have been carried out to determine the food consumption structure of 80 Hungarian households in two non-consecutive days, offering information on nutrition of nearly 200 respondents. The sample was distorted, because the dwellers of capital of Hungary, and the intelligentsia have been over-represented in it, but could furnish reliable information on consumption-structure of middle-, and middle-upper class of the society. Dataset has been analysed by different sophisticated artificial intelligence methods (machine learning algorithms), with purpose of obtaining an optimal classification of most characteristic food consumption patterns. On base of patterns, offering the best accuracy, as well as internationally accepted data-bases on recommended nutrition intake, taking into consideration the physical activity as well as demographic characteristics of the sample and the actual procuration prices of different products, applying the Linear Programming algorithm of Lindo® Systerms a recommended nutrition structure has been developed for each pattern.

**Results**: Comparative analysis of actual and optimized nutrition intake values highlights the false argument of high cost of healthy nutrition. This fact opens new frontiers for the tailor-made mobile applications, offering a suitable help for consumers of healthy, easy, cost-effective and sustainable food choice.

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J Food Nutr Disord, an open access journal
ISSN: 2324-9323

Nutrition Congress 2017
June 29-July 01, 2017

Volume 6, Issue 3 (Suppl)

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