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**PO2941****MODULATORY EFFECT OF FERULIC ACID ON LPS-INDUCED INDOLEAMINE 2, 3-DEOXYGENASE (IDO) EXPRESSION IN MICROGLIA**

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**Background and objectives:** Indoleamine 2,3-deoxygenase (IDO) act as rate-limiting enzyme in inflammation of the central nerve system(CNS). Ferulic acid (FA) is a kind of polyphenol contained in rice bran, and is reported to have anti-inflammatory effect. In this research, we investigated the effect of FA on lipopolysaccharide (LPS) induced IDO in microglia.

**Method:** Microglia cell line MG6 treated with various concentration of FA and E.coli derived LPS, and was measured of IDO mRNA expression by real-time PCR, TNF- $\alpha$  and IL-6 production was also measured by ELISA. Furthermore, to reveal the mechanism of inhibitory effect of FA, we performed western blotting to measure some kinds of proteins involved in MAPK and NF $\kappa$ B signaling pathways using western blotting.

**Result:** FA suppressed LPS-induced IDO mRNA expression, but not TNF- $\alpha$  and IL-6. LPS induced I NF $\kappa$ B degradation was suppressed by FA in a dose dependent manner. However, phosphorylation of proteins involved in MAPK pathway weren't suppressed by FA.

**Conclusion:** These results suggested that inhibition of NF $\kappa$ B pathway involved in suppression of LPS induced IDO mRNA expression by FA.

**Key words:** tryptophan, IDO, ferulic acid, inflammation, microglia

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**PO2942****VITAMIN D STABILITY IN FORTIFIED FOOD EMULSIONS**

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**Background and objectives:** Designing food products to control stability of lipophilic food compounds includes developing emulsions with specific structural characteristics. We focus on building interfacial layers from proteins and polysaccharides that surround lipid droplets and are resistant to degra-

ation during technological process and digestion. The aim of this study was to analyse storage stability of vitamin D in fortified emulsions and find out whether it is possible to increase bioavailability of vitamin D from these emulsions.

**Methods:** Objectives of our study were emulsions stabilized by whey proteins (WP) alone and together with carboxymethylcellulose (CMC) with addition of 0.5% vitamin D3. Vitamin D content in emulsions was determined by RP-HPLC after cleaning by normal phase chromatography. Emulsions were fed to rats. Rats were divided into 3 groups: control (usual diet); usual diet + 2 g emulsion with WP (Diet 1); and usual diet + 2 g emulsion with WP and CMC (Diet 2). Rats were given free access to food and water, emulsions were given once a day for 2 weeks. Levels of serum 25-hydroxyvitamin D (25(OH)D) as an index of the nutritional vitamin D in the rats body were evaluated.

**Results:** Analysis of vitamin D3 retention in emulsions stabilised by WP alone and WP together with CMC showed no statistically significant differences in vitamin content. Quantitative analysis of vitamin D3 in all emulsions stored for 10 days in the dark at +40C showed that vitamin content was stable and varied within standard deviation limits. Supplementation of rats diet by vitamin D3 for 1 week increased serum 25(OH)D level up to 151+/-31,5 nmol/L for Diet-1 and 169,7+/-10,17nmol/L for Diet-2, whereas for control group serum 25(OH)D concentration was 71+/-24,97 nmol/L (SD).

**Conclusions:** After 2 weeks in both groups receiving emulsions with vitamin D a plateau of 175,17nmol/L serum 25(OH)D was reached.

**Key words:** food emulsions, vitamin D

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**PO2943****BIOACCESSIBILITY ASSESSMENT OF CAROTENOIDS FROM COMERCIAL NUTRACEUTICAL PRODUCTS**

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**Background and objectives:** Health-promoting products are getting popular among consumers and a large list of nutraceuticals containing phytochemicals from foods is available in the Brazilian market. Research on their bioavailability is essential to elucidate the potential health benefits of carotenoids formulations, since it depends on digestive stability, released

from the matrix (referred as bioaccessibility) and transepithelial passage efficiency. In vitro digestion models are being extensively used to predict carotenoids bioaccessibility in a rapid and cheaper way, besides not involve ethical aspects as in vivo assays. The aim of this study was to assess carotenoids bioaccessibility from five available capsule-formulations of nutraceuticals in the Brazilian market, claimed as carotenoid source and with several health benefits. The nutraceuticals products were purchased in local stores in Rio de Janeiro, Brazil.

**Methods:** An in vitro digestion model was applied by mimicking oral, gastric and intestinal physiological conditions. Five percent (w/w) of canola oil was added to the samples. Analyses involved enzymes as  $\alpha$ -amylase, pepsin, bile, pancreatin, lipase and inorganic salts. Physiological variations were reproduced by the bath shaker with orbital gyros (37°C) and ultracentrifugation (5000g, 45 min). Identification and quantification of carotenoids were performed by HPLC, using a 33°C column oven, PDA detector, and a C30YCM Column. Carotenoids separation was obtained by a gradient elution of methanol and methyl tert-butyl ether, using a 0.8mL/min flow rate, injection volume of 15  $\mu$ L and run time of 28min.

**Results:** Bioaccessibility of carotenoids was decreased after pass through the gastro-intestinal model and varied among the five formulations. A lycopene formulation presented greater bioaccessibility in the small intestine (48,02%) than other ones rich in  $\beta$ -carotene (0.96%, 31.29%, 34.45% and 36.22%) or one rich in lutein (0.86%).

**Conclusions:** These results showed that the available carotenoids amounts for absorption in these products are much lower than declared in the label.

**Key words:** In vitro digestion,  $\beta$ -carotene, lycopene, lutein, bioavailability

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## PO2944

### PEANUT BUTTER FRUIT: A RICH SOURCE OF LYCOPENE

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**Background and objectives:** The interest in South American native plant species has been growing in recent years due to their health benefits. The species *Bunchosia armeniaca* (Cav.) DC. is a plant from Andes and the popular name is peanut but-

ter fruit. In Brazil it is cultivated for a long time, but only in domestic orchards, known as caferana, cafezinho, ciruela, caramela, ameixa-do-pará or ameixabrava. Due to its orange to red color, typical of carotenoids, the aim of the present study was to quantify and determine the carotenoids profile in the edible parts of the fruits.

**Methods:** Peanut butter fruits were collected in January 2013 in the city of Rio de Janeiro, Brazil. Total carotenoid content were evaluated by spectrophotometric method at 450nm and the carotenoids profile by High Performance Liquid Chromatography.

**Results:** The fruit pulp presented high levels of total carotenoids (40 mg/100 g wet basis), in which 89% was lycopene (36 mg/100 g), followed  $\beta$ -carotene (2.5 mg/100 g) and lutein (0.3 mg/100 g). Lycopene is the carotenoid with the highest antioxidant activity and is present in high concentrations in the prostate tissue, which may explain its role in reducing the risk of prostate cancer. In Brazil, prostate cancer is the second most common among men, behind skin cancer. It is the sixth most common cancer type in the world and the more prevalent in men, accounting for about 10% of all cancers. The tomato and its products are considered the main sources of lycopene in the Western diet.

**Conclusions:** The peanut butter fruits are a rich source of lycopene presenting 10 times more than the tomato fruit (3.5 mg/100 g). This biodiversity fruit has a great potential of use, once it has a good taste to eat fresh and can also be used as an ingredient in preparations to increase the lycopene levels in food.

**Key words:** *Bunchosia armeniaca*, carotenoids, biodiversity fruits, bioactive compounds.

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## PO2945

### EVALUATION OF ANTHOCYANIN PROFILE IN APPLE PEEL OF THREE CULTIVARS PRODUCED IN BRAZIL

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**Background and objectives:** The annual apple production in Brazil has remained around one million tonnes/year. In the processing industry of fruit juices, apple juice is considered one of the main products. This juice production generates 25 to 30% of waste (bagasse: peel, pulp and seed) which has aroused the interest of the scientific community, aiming its use for the