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-α 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 NFκB signaling pathways using western blotting.

Result: FA suppressed LPS-induced IDO mRNA expression, but not TNF-α and IL-6. LPS induced NFκB 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 NFκB pathway involved in suppression of LPS induced IDO mRNA expression by FA.

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

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 degradation 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 stabilised 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 +4°C 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

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 α-amylase, pepsin, bile, pancreatic 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 µL 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 β-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, β-carotene, lycopene, lutein, bioavailability

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 production of products with added nutritional and functional benefits. Anthocyanins are a particularly promising group of natural compounds due to their antioxidant activity and diverse phenotypic colours. In Brazilian apple industry, research has been conducted to develop innovative products to add value to such a waste stream.

Background: The consumption of fruits and their by products, the apple peel contain high levels of anthocyanins which are pigments responsible for the red color of the apple. It is a concern for the processing industry to be able to produce high quality products with added value to the apple peel.

Objectives: To evaluate the anthocyanins profile of peel from three apple cultivars. "Ferraria", “Copa” and “Georgina” produced in the city of São Paulo, Brazil.

Methods: The total peel of the three cultivars was collected in January 2013. The anthocyanins concentration was determined in the peel of apples by spectrophotometry. The munsell color was evaluated using a Macbeth Coloro and the total carotenoids content was quantified by spectrophotometric method at 450nm. The anthocyanins profile was identified by HPLC analysis.

Results: The total anthocyanins concentration was higher in the peel from "Ferraria" cultivar (141.2 mg/100 g) than in "Copa" (96.2 mg/100 g) and "Georgina" (80.2 mg/100 g). The munsell color of the peel was evaluated and the color was redder in "Ferraria" (1.56) than in "Copa" (1.28) and "Georgina" (1.20). The total carotenoids concentration was higher in "Ferraria" (1.6 mg/100 g) than in "Copa" (1.1 mg/100 g) and "Georgina" (0.9 mg/100 g). The anthocyanins profile was identified by HPLC analysis and the main anthocyanins identified were cyanidin 3-glucoside and cyanidin 3-glucoside-5-coumaroyl. The anthocyanins profile was identified by HPLC analysis and the main anthocyanins identified were cyanidin 3-glucoside and cyanidin 3-glucoside-5-coumaryl.

Conclusions: The apple peel from the "Ferraria" cultivar presented higher anthocyanins concentration and the highest munsell color than the other two cultivars. The apple peel from the "Ferraria" cultivar presents a great potential for the production of natural pigments with antioxidant activity.

Keywords: Apple peel, anthocyanins, color, total carotenoids, HPLC.