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CONGRESS ABSTRACTS

BIONUTRI-9

The dietary combination of CLA and pine nut oil prevents the CLA-induced fatty liver in mice

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The acronym CLA (Conjugated Linoleic Acid) indicates a group of positional and geometric isomers of linoleic acid. These isomers strongly prevent fat accumulation in adipose tissue of mice, even if hepatic fat deposition and insulin resistance are concomitantly observed.
In this study, we investigated the effects of a dietary combination of CLA and pine nut oil on lipid metabolism in mice, in order to check whether the association between these two dietary fats would be able to maintain the positive effects of CLA while preventing the undesirable effects.
Our results indicate that the co-administration of CLA with pine nut oil not only preserved the CLA-mediated body fat reduction preventing hepatic steatosis, but also positively affected the liver and plasma lipid content.
Furthermore, the investigation of enzymatic activities involved in both fatty acid synthesis and oxidation revealed a time-dependent biphasic behavior.
The results obtained, besides revealing the beneficial effects of the association of CLA with pine nut oil in the diet, provided new information on the molecular mechanisms responsible for CLA action in the organism.

BIONUTRI-10

Transepithelial transport of betalainic phytochemicals in Caco-2 cell monolayers.

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Betalain pigments are bioavailable in humans (1). In this study we examine the transepithelial transport of Indicaxanthin and Betanin, the main dietary betalains, by measuring the rate of transport across differentiated Caco-2 cell monolayers. In the absence of a proton gradient, transport of both betalains is transcellular and bidirectional. The value of P_{app} indicates that both pigments may be quantitatively absorbed at the intestinal level, with the efficacy of Indicaxanthin (P_{app} $7.21\pm0.8x10^{-6}$ cm s^{-1}, n=6) higher than that of betanin (P_{app} 1.21 ± 0.2 $x10^{-6}$ cm s^{-1}, n=6). Whereas transport of Indicaxanthin was independent of pH gradient, that of betanin was dependent on pH in a vectorial way in the apical-to-basolateral direction. Calculated P_{app} for proton-coupled polarized transport of betanin was $5.56\pm0.6x10^{-6}$ cm s^{-1} (n=4). NaN_3, valproic acid, ferulic acid acetic acid but not tetraethylammonium chloride, inhibited the permeation of betanin, suggesting an energy-dependent transport of the pigment by a hydrogen-coupled monocarboxylic acid transporter. When samples of apical-to-basolateral transported material were submitted to enzymatic deconjugating, no change in either indicaxanthin or betanin content was apparent, indicating that conjugation of the pigments during permeation did not occur.

1. Tesoriere L., Allegra M., Butera D., Livrea M.A. Am. J. Clin. Nut. (2004), 80, 941-945.