

ESPEN 2014 - Abstract Submission

Nutritional assessment

ESPEN14-1252

METABOLIC TRANSFORMATION OF APPLE POLYPHENOLS IN HUMAN BODY

Kajetan Trost¹, Marynka Ulaszewska¹, Jan Stanstrup¹, Fausta Natella², Cristina Scaccini², Fulvio Mattivi¹

¹Food Quality and Nutrition, Research and Innovation Centre, Fondazione Edmund Mach, San Michele all'Adige, ²Food and Nutrition Research Center, Consiglio per la Ricerca e la sperimentazione in Agricoltura, Rome, Italy

Presentation Method : Oral or Poster presentation

If you think another topic than the one selected at first would suit your abstract, please choose below.: Nutritional assessment

Please indicate your professional occupation: Other

The presenting author fulfills the above conditions and wants to apply for a travel award: Yes

I confirm that the presenting author is under the age of 35: Yes

Rationale: Fruit and vegetables are claimed to have beneficial effect on human health mostly due to their high polyphenol (PP) content. (1) Regular consumption is protective against age related diseases and different forms of cancer (2). As PP are largely metabolized both by the human organism and gut microbiota, identification of the forms of metabolites and the kinetics of their appearance into the circulation is essential for understanding their possible bioactivity in humans.

Methods: In order to evaluate absorption and transformation of apple polyphenols, a human single-dose crossover controlled blind experiment was designed. In 2 different sessions 12 subjects were supplemented with apple juice (1 g/l total PF) or polyphenol enriched apple juice (4 g/l total PF). Urine and plasma samples were collected at different time points and analyzed using an untargeted metabolomics approach.

Results: Scarcely metabolized polyphenols were recognized as potential biomarkers. These compounds showed two different kinetic patterns. Epicatechin methyl sulfate, ferulic acid sulfate and phloretin glucuronide reached their maximal concentration 1 hour after apple juice supplementation. While, the methyl, sulfate and glucuronide conjugates of valerolactons had their peak concentration 5 hours after the supplementation. The concentration of the majority of the biomarkers showed an increase four times greater in high PP diet than in low.

Conclusion: Untargeted metabolomics allowed identification of biomarkers of apple consumption and demonstrated that an increase in polyphenol intake corresponds to an increase of circulating metabolites within the limits of 'normal' consumption. Thus, if the beneficial effects of these compounds are confirmed, it might prove beneficial to increase their plasma concentration by increasing their intake or choosing polyphenols richer foods.

References: [1] Del Rio et al., 2013; ARS, 18: 1818-1892

[2] Gerhauser, 2008. Planta Med. 74:1608-24

Disclosure of Interest: None Declared

Keywords: apple polyphenols, metabolomics