

# ESPEN 2014 - Abstract Submission

## *Nutritional assessment*

ESPEN14-1252

### **METABOLIC TRANSFORMATION OF APPLE POLYPHENOLS IN HUMAN BODY**

Kajetan Trost<sup>1</sup>, Marynka Ulaszewska<sup>1</sup>, Jan Stanstrup<sup>1</sup>, Fausta Natella<sup>2</sup>, Cristina Scaccini<sup>2</sup>, Fulvio Mattivi<sup>1</sup>

<sup>1</sup>Food Quality and Nutrition, Research and Innovation Centre, Fondazione Edmund Mach, San Michele all'Adige, <sup>2</sup>Food 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