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Abstract Title: CAN 2 APPLES A DAY DECREASE CHOLESTEROL AND MODULATE THE GUT MICROBIOME IN MILDLY HYPERCHOLESTEROLAEMIC SUBJECTS?
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Abstract Submission:
Apples are a rich source of polyphenols and fiber. An important proportion of these bioactive components escape digestion in the upper intestinal tract and reach the colon where they can be transformed by the gut microbiota. A randomized, controlled, crossover, intervention was performed (AVAG-AGER study) to test the hypothesis that 2 apples a day can beneficially modulate the gut microbiome and cardiovascular health in mild hypercholesterolaemic subjects.

Forty volunteers consumed 2 apples (Renetta Canada variety) or 100 ml of a sugar matched control drink, daily for 8 weeks separated by 4-week washout period. Blood, urine and faecal samples were collected before and after each treatment.

We combined targeted and untargeted analytical strategies for metabolomic fingerprinting of body fluids. LC-HRMS Orbitrap was used for untargeted assays to identify the putative biomarkers of intake and for the validation of apple consumption markers. Additionally, targeted assay with use of UHPLC-MS/MS was employed for bile acids and carnitines quantitative profiling with isotopic dilution method. Changes in faecal populations were identified using fluorescence in situ hybridization (FISH) and 16S rRNA gene profiling

Preliminary results show a significant time x treatment interaction for total cholesterol, LDL-cholesterol and vascular cell adhesion molecule-1 with lower concentrations after apple intake compared to both, the baseline measurements and the control apple juice. Metabolomics analysis allowed to further investigate the compliance and the putative mechanisms of actions, with the identification of a number of dose dependent biomarkers – including various microbial classes of apple polyphenols., as well as significant changes of bile acids in plasma of treated volunteers. FISH and 16S rRNA analysis indicates a small change in selected bacterial groups for the same group of subjects.

Consuming 2 apples a day may in conclusion beneficially affect cardiovascular health and modulate both microbial composition and metabolic output.