

# NuGOweek 2019 - 16th edition

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## From Foodomics to Nutrigenomics: Translating food composition data into healthy diets

### Book of abstracts

In partnership with the National Committee of the International Union of  
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# **From foodomics to nutrigenomics – Translating food composition data into healthy diets**

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Bern, Switzerland**



NuGO is an Association of Universities and Research Institutes focusing on the joint development of the research areas of molecular nutrition, personalised nutrition, nutrigenomics and nutritional systems biology

## Measuring Polyphenols Metabolism in Mankai Duckweed: a novel aquatic and amino rich Plant Protein Source

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The duckweed Mankai, is based on a specific strain of *Wolffia globosa*, one of the smallest plants on earth, belonging to the family *Lemnaceae*. Mankai is being considered as a high-quality substitute for animal protein, and a potential source of vitamin B<sub>12</sub> and iron. In fact, it contains all 9 essential amino acids and its protein profile is extremely close to that of egg. Recently, it has been granted GRAS status, and chosen as a test food in a long-term intervention DIRECT-PLUS (ClinicalTrials.gov identifier (NCT number): NCT03020186). Our role will be to determine and compare the metabolic fate of Mankai polyphenols in plasma and urine of 300 volunteers suffering from cardiometabolic disease randomly assigned to physical activity (PA), PA + MED diet, or PA + green-MED diet (enriched with Mankai). However, molecular characterization of phenolic composition of Mankai plant has not previously been reported. Therefore, our initial measurements of total phenolic content determined by Folin-Ciocalteu assay classifies Mankai amongst the foods highest in polyphenols content (8606.7 mg/kg). Then, we characterized the polyphenols profile using an UHPLC-ESI-MS/MS system, identifying 26 different polyphenols. One of the main advantages of Mankai is its hydroponic cultivation that optimizes yield throughout the year. Light source, water and mineral management can influence the composition of phenolic content. Our analysis has been done in 30 different plant batches treated with 5 different treatments to assess how quality of light may play a major role in the accumulation of secondary plant compounds. Notably, led light seems to enhance the glycosylated form of luteolin and quercetin compared to sunlight and the aglycone form of luteolin and quercetin are higher in sunlight treatment. The present analysis confirms the high polyphenol status of Mankai, profiles its major polyphenol components and provides new information on how production process in terms of light quality determines polyphenol content.