

with worsening MVC odds for these already vulnerable patients, underscoring the need for re-evaluation of the most effective RD-based clinical care interventions.

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P03-012-24 Combining Proteomics and Metabolomics to Assess Protein Digestibility

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Objectives: We presented a clinical feeding study aimed at assessing the digestibility of proteins derived from various food sources in a cohort of 16 human subjects. Our approach involved integrating a food proteomics platform with a rapid-throughput targeted metabolomics platform to elucidate protein digestibility by establishing correlations between the amino acid composition present in foods and the corresponding concentrations of amino acids detected in serum.

Methods: Four types of burger patties were cooked and fed to 16 subjects. Blood samples were drawn from subjects at different time points. For food proteomic, cooked burger patty. For the food proteomic, the cooked burger patty went through protein extraction (urea, SDS), trypsin digestion, and S-trap filter clean up before being injected into a nano-LC system coupled with Orbitrap Fusion Lumos mass spectrometry with Nano-ESI source. Proteomic data processing was done by FragPipe GUI. For metabolomic, the serum sample was extracted with internal standard-added buffer and cleaned with Folch- extraction. Amino acids solution was then injected into UHPLC-QqQ mass spectrometry for separation and analysis.

Results: Bottom-up proteomics characterized protein sources (beef, pork, pea, tofu). Around 706 protein groups were identified and quantified across three replicates, more from pork and tofu. The top 15 abundant protein groups accounted for ~74% relative abundance, indicating dominance by few proteins. We estimated amino acid profiles from proteomics data, revealing tofu's high proline and glutamine, pea's high glutamate and leucine. Plant-based burgers had higher serine, phenylalanine, asparagine, and aspartate; animal-based burgers were higher in others. We explored amino acid concentration changes in serum after protein digestion in 16 subjects. Variability existed among subjects and foods, with subject 14 showing the highest change in essential amino acids after eating beef. We calculated a "digestibility score" correlating food amino acid composition with serum concentrations, a promising tool for personalized nutrition. Di and tripeptide data will enhance specificity in future analyses.

Conclusions: A novel platform combining food proteomic and human metabolomic was applied to a clinical feeding study to assess protein digestibility.

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P03-013-24 Reduced Rank Regression Derived Dietary Patterns and Human Diseases: A Prospective Study of UK Biobank

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Objectives: Previous research has identified dietary patterns (DPs) and linked them to diabetes and cardiovascular diseases, but their associations with other diseases remain unclear.

Methods: We included UK Biobank participants with two or more 24-h online dietary assessments. DPs were derived using reduced rank regression with 50 food groups as predictors and four nutrients as responses (energy density, free sugar, saturated fat and fiber). Cox models examined the associations between DPs and 623 Phecode-based diseases, covering all disease categories, after excluding the participants with baseline relevant diseases. Incident outcomes were confirmed through death registry, cancer registry and hospitalisation datasets. Models were adjusted for sex, age, socioeconomic status, education, ethnicity, smoking and physical activity. False discovery rate correction addressed multiple comparisons.

Results: In 125095 participants (56.3% females, mean age 59.5 years), we derived three DPs, explaining 75.1% of variance in response nutrient variables (45.3%, 19.5% and 10.3% for DP1, DPD2, and DP3). DP1 featured higher intake of chocolate confectionary, fat spread, desserts and red meat, with lower fruits and vegetables intake. DP2 featured higher fat and red meat, with lower sweetened beverage, fruit juice, free sugar and alcoholic beverage. DP3 featured higher sugar, fat and vegetable, with lower alcoholic beverage, bread and pasta/rice. During 9.2-year follow-up, DPs were associated with various diseases across categories. Specifically, DP1 was associated with 41 Phecode outcomes (e.g., obesity, circulatory diseases, colorectal cancer, mineral metabolism disorders, anxiety, pneumonia, respiratory insufficiency and failure, non-alcoholic fatty liver disease, cholelithiasis, renal failure). DP2 was associated with 14 Phecode outcomes (e.g., obesity, diabetes, pneumonia, gastritis and duodenitis, spondylosis). DP3 was associated with 29 Phecode outcomes (e.g., diabetes, hypercholesterolemia, gout, anaemia, septicaemia, non-Hodgkins lymphoma, anxiety).

Conclusions: The derived DPs exhibited associations with a broad spectrum of human diseases.

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P03-014-24 Assessment of the Efficacy of a Novel Oral Supplement on Symptoms of Bloating Among Healthy Pre-Menopausal Women

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Objectives: Bloating is a common complaint among the non-diseased public, with the prevalence in women being twice as high than men. This can affect daily life, social interactions, and can be triggered by dietary habits. Plant-derived natural solutions to manage bloating have accordingly been increasing in