

Food and gut microbiota of young Nunavik Inuit: rationale and description of planned analyses

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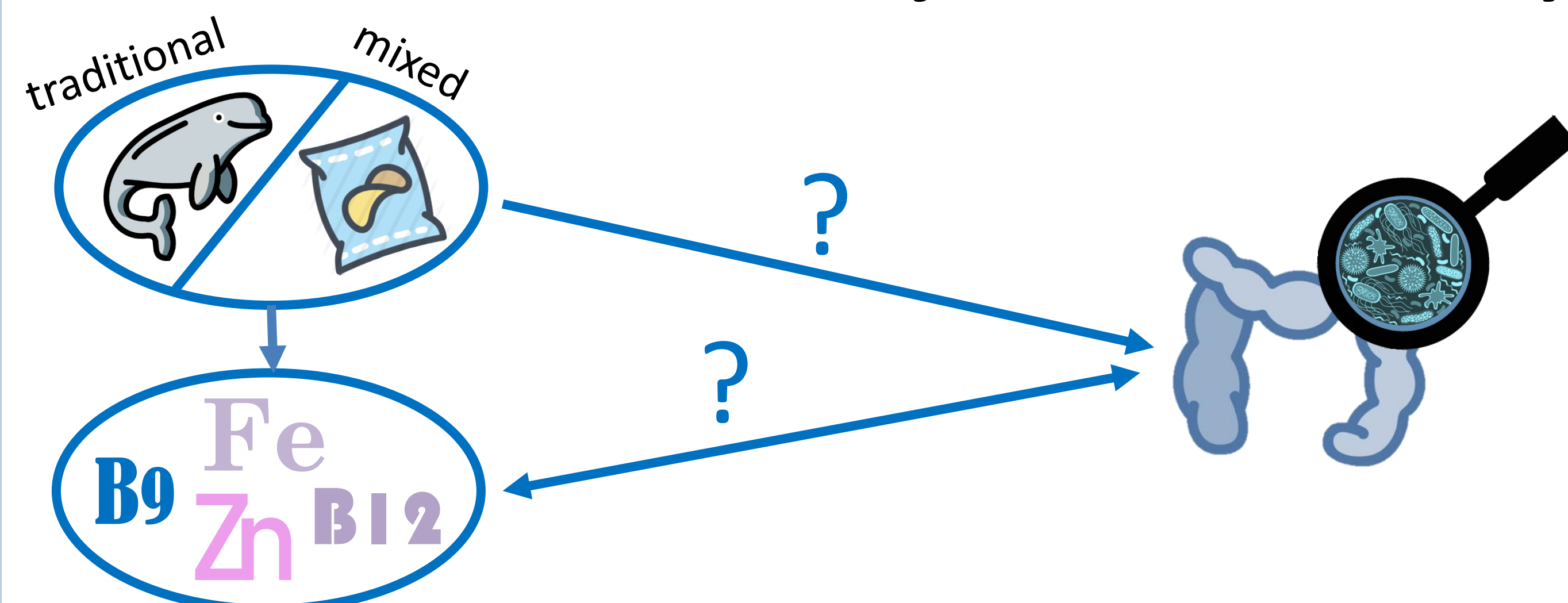


Introduction

- Traditional Inuit diet rich in animal proteins, essential nutrients and vitamins (A, C, D, B9 & B12)
- Food changes (FC) characterized by an increase of processed foods and a decrease of traditional food in the diet
- FC associated with the emergence of chronic diseases – Gut microbiota as a potential mediator
- Diet: major determinant of the composition of the gut microbiota
- Specific food profile → nutritional determinants specific to the Inuit population that result in distinct microbial profiles?

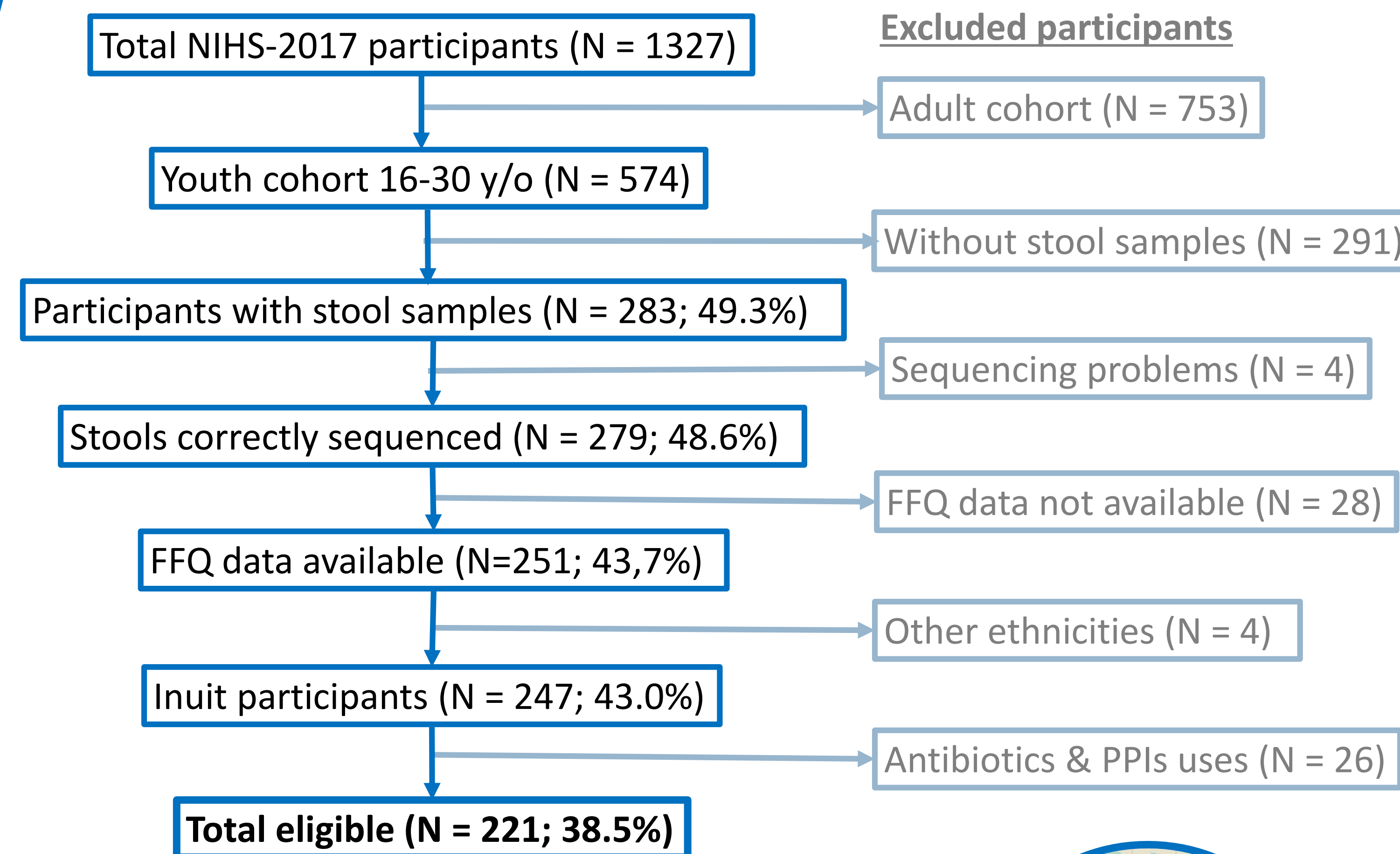


Objective of the study



Hypothesis: Traditional diet (food & nutrients) associated with ↑ bacterial diversity & presence of bacterial taxa with beneficial health effects

Sampling



Exclusion criteria:

- X Inuit participants < 16 or > 30 y/o
- X Youth without stool samples
- X FFQ data not available
- X Non-Inuit participants
- X Youth who took antibiotics & proton-pump inhibitors (PPIs) in the last month prior to stool collection



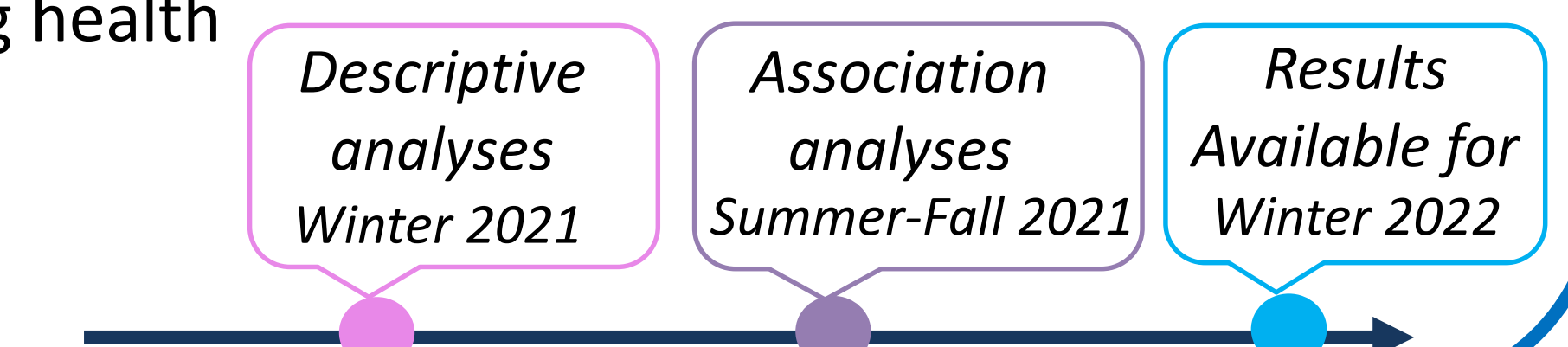
Statistical analyses



- Food profiles: Principal component analysis (PCA)
- Modeling: covariate-adjusted association and variance analyses from data collection
- Machine learning (ML) processes (ML: Random Forest)

Anticipated results

- Study of the relationship between diet and gut microbiota composition in Nunavik Inuit youth: greater bacterial diversity associated with traditional diet
- Greater diversity = better prognosis of adaptability to a changing environment
- Putting the expected associations into perspective will support communities' efforts to understand the processes underlying health



Acknowledgements

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Data collection

Nunavik Inuit Health Survey-2017 (NIHS-2017) data collected aboard the CCGS Amundsen (Aug. 19 – Oct. 5, 2017)



Questionnaires: Substance use, physical activity, food security, food frequency questionnaire (FFQ), sociodemographic data



Clinical tests: Anthropometric measurements (height, weight, waist circumference, BMI, etc.), cardiovascular health (blood pressure, blood lipids, etc.)

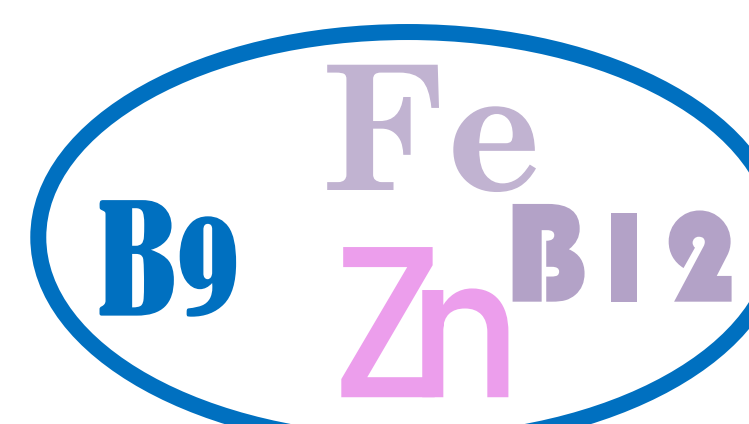
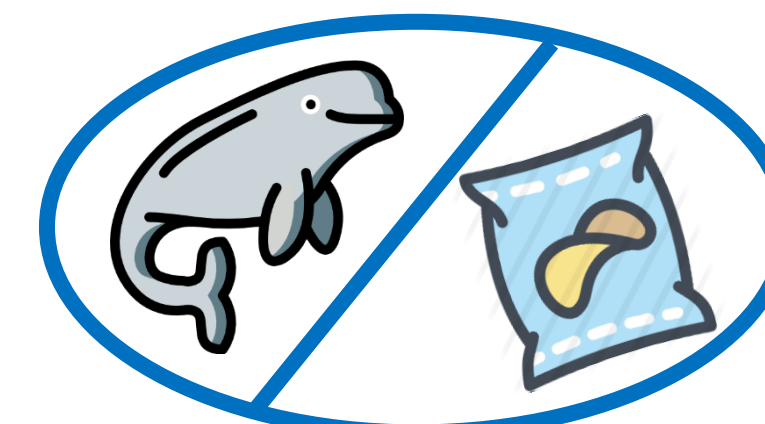


Laboratory tests: Blood tests (vitamin, micronutrients, contaminants... etc.), urine (contaminants, clinical biochemistry), stool samples (H. pylori, analysis of intestinal microbiota composition)

Independent & dependent variables

Food variables

- Data from the FFQ
- Approached from several angles:
 - ↳ Food profiles
 - ↳ Food categories
 - ↳ Food indices
 - ↳ Macro-, micronutrients & vitamins



Gut microbiota composition

- Derived from the metagenomic analysis of stools
- Characterized using:
 - ↳ Variation of microbes in a single sample (**α-diversity**) & variation of microbial communities between samples (**β-diversity**)
 - ↳ Ratio of abundance of one specie to one or multiple other species in a given sample (**relative species abundance**)
 - ↳ Microbial profiles