Food and Agriculture Organization of the United Nations

14TH INTERNATIONAL FOOD DATA CONFERENCE

1–3 September 2025, Rome, Italy

AGENDA AND BOOK OF ABSTRACTS

Contents

Abbreviations

AFACI	Asian Food and Agriculture Cooperation Initiative
AOAC	Association of Official Analytical Chemists
ASFs	animal-source foods
AUSNUT	Australian Food and Nutrient Database
CLAS	composition and labelling information system
CREA	Council for Agricultural Research and Economics (Italy)
EFSA	European Food Safety Authority
EU	European Union
EUROFIR AISBL	European Food Information Resource
FAIR	findable, accessible, interoperable, and reusable (data principles)
FAO	Food and Agriculture Organization of the United Nations
FCDB	food composition database
FHERITALE	Food, Health and Environment Research Infrastructures to Tackle Emerging Priorities
HelTH	Hellenic food thesaurus
ICP-MS	inductively coupled plasma – mass spectrometry
ICP-QQQ-MS	inductively coupled plasma – triple quadrupole mass spectrometry
IFDC	International Food Data Conference
INDDEX24	International Dietary Data Expansion 24-hour dietary recall
INFOODS	International Network of Food Data Systems
LATINFOODS	Latin American Network of Food Data Systems
LC-MS	liquid chromatography-mass spectrometry
LMICs	low- and middle-income countries
PFPs	processed fish products
PTFI	Periodic Table of Food Initiative
RDA	Rural Development Administration (Republic of Korea)
REDCap	research electronic data capture
SAFOODS	South African Food Data Systems
UK	United Kingdom
URUGUAYFOODS	Uruguay Food Data Systems
WALNUT	web assessment on lifestyle and nutrition
XRF	X-Ray Fluorescence

Welcome to the Food and Agriculture Organization of the United Nations

Dear colleagues,

It is my pleasure to welcome you to the 14th International Food Data Conference (IFDC), hosted by the Food and Agriculture Organization of the United Nations (FAO) from 1 to 3 September 2025. This year's theme, "*Food composition databases: application for healthy diets and sustainable agrifood systems transformation*", emphasizes the importance of food data in fostering global health and sustainability.

The IFDC brings together the International Network of Food Data Systems (INFOODS), a worldwide voluntary network of food composition experts dedicated to improving the quality, availability, reliability and use of food composition data, and others with an interest and expertise in food composition.

I anticipate a productive exchange of knowledge and the formation of valuable partnerships among professionals from various sectors. Rome, with its rich cultural heritage, provides an inspiring backdrop for the discussions.

I look forward to your participation and wish you a successful and enriching conference.

Lynnette Neufeld

Director
Food and Nutrition Division
Food and Agriculture Organization of the United Nations

Welcome to the 14th International Food Data Conference

On behalf of the Organizing Committee, it is with great pleasure that we welcome you to the 14th International Food Data Conference (IFDC), a unique forum that brings together experts from around the globe to share insights, innovations and experiences in the field of food composition.

The conference programme, developed with support from the Scientific Committee members of the International Network on Food Data Systems (INFOODS), features sessions on a wide array of subthemes. We will delve into topics from the generation to the application of food composition data, exploring its potential impact on nutrition, health, and food policies and programmes.

We are excited to foster an environment where diverse professionals including students, food scientists and researchers from the public sector, universities, research and development organizations, scientific associations, industry and international agencies can collaborate, exchange knowledge and form new partnerships. We invite you to enjoy the professional engagement that defines the voluntary INFOODS community, to inspire and be inspired, to learn from the successes of others and to apply state-of-the-science technologies, methodologies and approaches in your own work.

Rome, with its rich history and vibrant culture, provides the perfect backdrop for our conference. As you immerse yourself in the scientific discussions, we encourage you to also explore the city's ancient landmarks and enjoy its world-renowned cuisine to make your stay memorable.

We hope that the Conference will be a fruitful and enriching experience for all attendees. Together, let us work towards advancing the field of food composition and contribute to the transformation of agrifood systems for a sustainable and healthy future.

Let me take this opportunity to sincerely thank all members of the Organizing and Scientific Committees for their tireless efforts in preparing the conference.

Welcome to Rome and to the 14th International Food Data Conference!

Bridget Holmes

INFOODS Global Coordinator and Chair for the 14th International Food Data Conference, on behalf of the Organizing Committee

Organizing Committee

Food and Nutrition Division, Food and Agriculture Organization of the United Nations

Rome, Italy

Bridget Holmes

Fernanda Grande

Yuko Nanjo

Isabella (Jiaqi) Guo

Doris Rittenschober

Victoria Padula de Quadros

Merieme Ihiri

Chailert Oliveri

Scientific Committee

Name (first name, surname)	Affiliation
Ananthan Rajendran	Food Chemistry Division, Indian Council of Medical Research – National Institute of Nutrition, India
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Paul Finglas	European Food Information Resource (EuroFIR AISBL), Belgium /Quadram Institute Bioscience, United Kingdom
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Prapasri Puwastien	Institute of Nutrition, Mahidol University, Thailand
Thingnganing Longvah	Indigenous Peoples' Food System, India
Zhu Wang	National Institute for Nutrition and Health, Chinese Center for Disease Control and Prevention, China

Scientific programme

All oral presentation sessions will take place in the Green Room (building A, first floor). All poster sessions will be held in the Atrium (ground floor). The webcast of the oral presentation sessions will be accessible from 1 to 3 September via the FAO-Webcast page. Direct links are provided below:

Day 1 – Monday, 1 September 2025: webcast link 1

Day 2 – Tuesday, 2 September 2025: webcast link 2

Day 3 – Wednesday, 3 September 2025: webcast link 3

DAY 1 – MONDAY, 1 SEPTEMBER 2025

8.00–9.30 Participant registration – FAO Headquarters (registration desk located directly outside the Green Room, building A, first floor).

OPENING SESSION

9.30–11.00 **Chairs: Lynnette Neufeld and Bridget Holmes**

OPENING remarks and welcome address

Lynnette Neufeld, Director, Food and Nutrition Division, Food and Agriculture Organization of the United Nations (FAO)
José Rosero Moncayo, Chief Statistician and Director, Statistics Division, FAO
Bridget Holmes, Global INFOODS Coordinator, Nutrition and Food Systems Officer, Food and Nutrition Division, FAO

INFOODS AWARDS

INFOODS Nevin Scrimshaw Award: **Paul Finglas**, European Food Information Resource (EuroFIR AISBL), Belgium /Quadram Institute Bioscience, United Kingdom
INFOODS Greenfield Southgate Award Lecture: **Kunchit Judprasong**, Institute of Nutrition, Mahidol University, Thailand

KEYNOTE ADDRESS

Keynote address 1: *A global overview of the state of food composition tables and databases,* **Fernanda Grande**

11.00–11.30 **Coffee break**

SESSION 1. New databases and approaches

11.30–13.00 **Chairs: Nancy Aburto and Kunchit Judprasong**

Remarks from Manuel Barange, Assistant Director General and Director, Fisheries and Aquaculture Division, FAO

Expanding and updating the Global Food Composition Database for Fish and Shellfish - closing the data gap on aquatic foods, **Doris Rittenschober**

Establishing an EFSA open-access European Food Composition Database (EU FCDB) in Europe, **Paul Finglas**

Development of a Nepali Food Composition Database with integrated dietary intake calculator, **Praju Adhikari**

An expert consensus framework for a database on ileal amino acid digestibility and protein quality scoring from foods consumed by humans, **Maria Xipsiti**

13.00–14.00 **Lunch break**

SESSION 2. New nutrient/compositional data

14.00–15.30 **Chairs: Thingnganing Longvah and Henrietta Ene-Obong**

Unlocking the nutritional and safety potential of North American seaweed and bivalves: a farmer-led, multi-omics study, **Chris Vogliano**

Total value of B group vitamins and L-carnitine in breast milk at different lactation period, **Zhu Wang**

Development of Khmer mixed dish compositional data from observed recipes collected by Cambodian women living in Cambodia, **Janelle Windus**

Determining the nutrient composition of foods commonly consumed by Indians in South Africa, **Hettie Schönfeldt**

Mineral profiling of less-known cereals using XRF and ICP- MS for sustainable nutrition in Nigeria, **Joseph Odolomarun Akuirene**

15.30–16.30 **Coffee break and poster session 1**

SESSION 3. Biodiversity and food composition

16.30–17.30 **Chairs: Hettie Schönfeldt and Jayashree Arcot**

Effects of biodiversity on green tea metabolites: a seven-year LC-MS comparison study and the estimation of scaling laws using rarefaction, **Masatoshi Funabashi**

Assessing biodiversity food richness through dietary surveys: a cost-benefit approach to guide the collection of consumption and composition data at below species level in an Italian case study, **Silvia Lisciani**

The Periodic Table of Initiative (PTFI): mapping food composition to empower human and planetary health solutions, **Selena Ahmed**

Nutritional evaluation of indigenous tuberous foods consumed by Meitei, Manipur, The Northeast India, **Ananthan Rajendran**

18.00–19.30 **Social event (welcome drink)**

DAY 2 – TUESDAY, 2 SEPTEMBER 2025

SESSION 4. New databases and approaches

9.00–10.30 **Chairs: Paul Finglas and Hettie Schönfeldt**

Keynote address 2: *Establishment of Asian Food Composition Database by AFACI Project of Korea RDA*, **Kunchit Judprasong**

Expansion of Food Composition Database for Bangladesh: challenges and experiences in low- and middle-income countries, **Nazma Shaheen**

Updating the Ethiopian Food Composition Table: methodological approaches and future directions, **Endale Amare**

Development of a food composition database in Mongolia, **Enkhjargal Buyandelger**

10.30–11.30 **Coffee break and poster session 2**

SESSION 5. Data methodology and dissemination

11.30–13.00 **Chairs: Thingnganing Longvah and Ousmane Ouédraogo**

The new era of technical solutions of food composition data management, dietary data collection and dietary intake calculation in national dietary surveys: an example from Finland, **Heli Reinivuo**

Fostering edible biodiversity through interoperable food composition data: a global effort to enhance human and planetary health, **Jenny Johana Gallo Franco**

Bridging the data gap: expert guidelines for the reporting of analytical data in aquatic foods for use in food composition databases, **Marian Kjellevold**

Foodomics education for systems change, **Kevin Cody**

Global food composition databases in the digital era: data attributes and FAIR data harmonization, an integrative review, **Sarah Brinkley**

13.00–14.00 **Lunch break**

SESSION 6. New nutrient/compositional data

14.00–15.30 **Chairs: Rajendran Ananthan and Jelena Milešević**

Changes in total fat and fatty acid content of beef, pork and lamb during the last 30 years, **Karianne Spetaas Henriksen**

Amino acid content and protein quality of South African processed meat, **Beulah Pretorius**

The chemistry of edible insects – the impact of chitin on nutritional analysis, **Helena Pastell**

Insights on effect of hydrothermal processing on millet antinutrients and mineral bioavailability, **Chandrama Baruah**

Determination of selenium in fish using ICP-QQQ-MS: analytical method and compliance considerations, **Kunchit Judprasong**

15.30–16.30 **Coffee break and poster session 3**

SESSION 7. Application of food composition databases

16.30–17.30 **Chairs: Nancy Aburto and Selena Ahmed**

Creating survey specific nutrient conversion tables to produce statistics on apparent nutrient intake shared through the FAOSTAT Food and Diet domain, **Ana Moltedo**

Integrating digital receipts with food composition information: a data infrastructure validated for consumer and dietitian use cases, **Jing Wu**

Addressing limitations in food composition data: EFSA's approach to intake assessments, **Rita Ferreira de Sousa**

Efficient implementation of changes to flour fortification in the UK for assessment of population nutrient intakes, **Angela Mulligan**

19.45–23.00 Social event (by invitation only – to be confirmed)

DAY 3 – WEDNESDAY, 3 SEPTEMBER 2025	
SESSION 8. Food composition data for agrifood systems transformation	
9.00–10.30	**Chairs: Paul Finglas and John de la Parra** **Keynote address 3 -** *From food composition to food system transformation: lessons from Indigenous Peoples' food systems of Northeast India*, **Thingnganing Longvah** *Fishery nutrient profiles: practical tools for nutrition-sensitive fisheries management in LMICs,* **Lorenzo Longobardi** *Contributions to requirements and cost-per-nutrient of processed fish products (PFPs) and other animal-source foods (ASFs) for women of reproductive age and children 6- 23 months in Delta State, Nigeria,* **Henrietta Ene-Obong** *Integrating food composition and environmental impact data: identifying and ranking sustainable food choices for risk-benefit assessment,* **Martina Pavlić**
10.30–11.30	**Coffee break and poster session 4**
SESSION 9. National and international activities	
11.30–13.00	**Chairs: Fernanda Grande and Enkhtaivan Gombosuren** *Exploring research electronic data capture [REDCap] capabilities for managing services and products of SAFOODS,* **Joelaine Chetty** *Challenges and achievements in capacity development and harmonization of food consumption data collection in EFSA EU Menu national dietary surveys in Balkan region for dietary monitoring, sustainable healthy diets and food systems transformation,* **Jelena Milešević** *LATINFOODS initiatives to enhance food composition data in Latin America (2022–2024),* **Maria Natalia Bassett** *Approach and resources for the sustainable update of the Portuguese Food Composition Database: a multi-source and collaborative strategy,* **M. Graça Dias** *Global harmonisation of dietary intake and food composition data with FoodEx2,* **Victoria Padula de Quadros**
13.00–14.00	**Lunch break**

SESSION 10. New databases and approaches

14.00–15.30 **Chairs: Kunchit Judprasong and Doris Rittenschober**

Development of the new Australian Branded Food Database, **Renee Sobolewski**

Developing the Greek branded food composition database (HelTH): update and expansion methodology, **Antonis Vlassopoulos**

Decoding food labels: a scalable framework for ingredient identification and classification, **Mirjana Andjelkovic**

Development of nutritional composition data for commonly consumed foods (generic foods) via statistical analysis and thematic reconfiguration of branded food composition data, **Antonis Vlassopoulos**

Development of a recipe calculation tool for Filipino mixed dishes and other prepared foods, **Rogel Villapaz**

15.30–16.00 **Coffee break**

CLOSING SESSION

16.00–17.00 **Chairs: Nancy Aburto and Bridget Holmes**

INFOODS success stories
IFDC best poster award
Important announcements

CLOSING REMARKS

Nancy Aburto, Deputy Director, Food and Nutrition Division, FAO
Valérie Bizier, Deputy Director (Data and Statistical Governance), Statistics Division, FAO
Bridget Holmes, Global INFOODS Coordinator, Nutrition and Food Systems Officer, Food and Nutrition Division, FAO

INFOODS Nevin Scrimshaw Award

Paul Finglas, European Food Information Resource (EuroFIR AISBL), Belgium/ Quadram Institute Bioscience, United Kingdom

Paul Finglas is a distinguished scientist whose 43-year career has advanced food composition, nutrition, and public health. His extensive scientific output (>180 publications; H-index 42) and international collaborations underscore his expertise and sustained commitment. Paul began his career under Prof. David Southgate at the Institute of Food Research in 1981 and went on to lead the 5th (1991), 6th (2002), and 7th (2015) editions of McCance & Widdowson's The Composition of Foods. He directed the Institute's Food Databanks National Capability for over a decade, overseeing its transition into the Food & Nutrition National Bioscience Research Infrastructure (FN-NBRI) at Quadram Institute Bioscience (UK).

Paul has made major contributions to analytical methods for vitamins, particularly B-vitamins and folates, and their role in human health. His work has addressed micronutrient intakes, status, and absorption, notably using stable isotopes in vivo to study folic/folate absorption. In efforts to advance analytical quality, he represented the UK in European vitamin method standardisation (CEN), collaborated for over fifteen years with the EC's JRC IRMM and the Community Bureau of Reference on inter-laboratory studies and certified reference materials, and completed a sabbatical as UK expert at the Community Bureau of Reference in Brussels. Internationally respected, he has led multiple European research and innovation projects and is currently active in eight Horizon Europe projects with EuroFIR.

Paul founded EuroFIR AISBL in 2009, transforming European food composition infrastructure and training, especially in Central/Eastern Europe and the Western Balkans, through capacity building, harmonisation, and sustainable network development. His work continues to shape food data quality, accessibility, and reuse globally, including in low- and middle-income countries, and supports European efforts to achieve FAIR (findable, accessible, interoperable, reusable) food data – covering nutrients, waste and side streams, and bioactive compounds. As leader of Eurofoods for nearly two decades, Paul has raised global food composition standards. He has implemented robust, practical quality systems and initiated training and capacity-building programmes, including international food composition courses and compiler development in CEEC, MENA, Latin America, Southeast Asia, and Sub-Saharan Africa. With national and international funding, he has enabled early-career researchers from developing nations to attend major conferences and workshops, integrating them into global networks.

As long-serving Editor-in-Chief of Food Chemistry and Food Chemistry X, Paul has championed food composition research worldwide, mentoring emerging scientists, facilitating visibility for rigorous studies, and reinforcing nutritional science capacity in low- and middle-income regions. He has also promoted international dialogue through food data conferences, special journal issues, and reallocating conference funds to support developing-country participation. Through strategic engagement with initiatives such as FOODforce, FNH-RI, METROFOOD-RI, and non-profits advancing evidence-based nutrition and health understanding, Paul has been a strong advocate for integrating interoperable food data into broader nutrition and health infrastructures, reinforcing its value for data-driven science and policy globally.

INFOODS Greenfield Southgate Award Lecture

Kunchit Judprasong, Institute of Nutrition, Mahidol University, Thailand

Assoc. Prof. Dr. Kunchit Judprasong is a distinguished expert in food composition and nutrition at the Institute of Nutrition, Mahidol University (INMU), Thailand. Beginning his career in 1987, he has dedicated decades to advancing the quality and accessibility of food composition data critical to health, nutrition policies, and sustainable food systems.

He earned his Master of Science in Food and Nutrition for Development from INMU in 1997 and further specialized with the FoodComp Course at Wageningen University in 1998. Dr. Judprasong has actively contributed to international food data conferences since 2001, presenting research globally and organizing the 8th International Food Data Conference in Bangkok in 2005.

Since April 2016, he has coordinated ASEANFOODS, the Southeast Asian Network of Food Data Systems, fostering collaboration among 11 member countries and supporting evidence-based nutrition policies and healthier diets. He also serves as deputy coordinator of the Asia Pacific Food Analysis Network (APFAN), promoting food safety and nutrition in the region.

His pioneering research includes nutrient content, bioactive compounds, and food safety in Asian foods, with over 25 peer-reviewed publications. He has innovated analytical methods, developed reference materials, and enhanced laboratory performance through interlaboratory comparisons and advanced techniques like isotope dilution mass spectrometry.

Dr. Judprasong is committed to capacity building, teaching master's and doctoral programs in nutrition and food science, and conducting training to improve expertise and data quality across the region. His leadership has significantly contributed to strengthening food composition science and sustainable nutrition in Asia.

14TH INTERNATIONAL FOOD DATA CONFERENCE

Food composition databases: application for healthy diets and sustainable agrifood systems transformation

Oral presentations

Disclaimer: *the abstracts in this publication are presented as submitted by the authors. The content, views, and opinions expressed are solely those of the respective authors and do not necessarily reflect the views or policies of FAO or the organizers of this event.*

(KEYNOTE.1) *A global overview of the state of food composition tables and databases*

Fernanda Grande, Doris Rittenschober, Yuko Nanjo, Ana Moltedo, Bridget Holmes

Food and Agriculture Organization of the United Nations (FAO), Italy.

Background and objectives: The ability to find accessible and good quality food composition tables and databases (FCTs) is essential in many areas of nutrition, particularly for establishing diet-health relationships. FAO and the International Network of Food Data Systems (INFOODS) have developed and disseminated a directory to serve as a key resource to catalogue national, regional and global FCTs. This directory provides bibliographical information for existing FCTs and corresponds to the most visited page on the FAO/INFOODS website. However, despite periodic updates, many FCTs listed in the directory are no longer accessible, have been replaced by newer versions or have broken or missing web links. The aim of this work was to enhance the completeness and accuracy of the online directory and to establish the most comprehensive global overview of existing FCTs.

Methods: An extensive update was conducted to collect new information on the most recently published FCTs worldwide, based on the list of 94 countries currently available on the directory. Additional details for each FCT were compiled to provide a more comprehensive description. Collated information was reviewed, complemented and validated by INFOODS coordinators from various countries and regions. Quality assessments were conducted for selected FCTs from different regions of the world by applying the FAO/INFOODS Evaluation Framework to assess the quality of published FCTs.

Results: Details for FCTs from over 100 countries and regions were updated. Additional information such as dataset format, accessibility (e.g. free access) and available languages were included for each FCT whenever possible. While about 100 countries have already published at least one FCT, many countries still have no FCT, particularly low- and middle-income countries. FCTs vary a lot in terms of quality, data documentation, number and type of foods and nutrients they contain, accessibility and frequency of update. Therefore, systematic quality assessments were conducted to better understand these variations and results will be published on a new version of the FAO/INFOODS website. This presentation will highlight the global coverage and important gaps in FCTs and discuss key findings on the quality assessment of selected FCTs.

Conclusion: The updated directory of FCTs centralizes the most recent and comprehensive information on FCTs available worldwide. The additional details will assist users in selecting the most appropriate FCTs for their needs. In particular, the quality assessments will help users to understand the strengths and limitations of the FCTs while also providing data compilers with insights into possible areas for improvements in future revisions.

Keywords: food composition, global coverage, FAO/INFOODS, quality assessment, evaluation framework

SESSION 1. New databases and approaches

(O1.1) *Expanding and updating the Global Food Composition Database for Fish and Shellfish - closing the data gap on aquatic foods*

Doris Rittenschober, Fernanda Grande, Sitilitha Masangwi, Yuko Nanjo, Anna J. Vincent, Bridget Holmes

Food and Agriculture Organization of the United Nations (FAO), Italy.

Background and objectives: Aquatic foods — animals, plants and algae harvested from freshwater and marine environments — are a key source of essential micronutrients for many communities worldwide. Food composition tables and databases (FCDBs) that include accurate data for aquatic foods are needed, not only to estimate their contribution to the nutrient intakes of individuals and populations, but also for the development of food-based dietary guidelines and for labelling purposes. The FAO/INFOODS (International Network of Food Data Systems) Global Food Composition Database for Fish and Shellfish (uFiSh), published in 2016, is a key resource among existing interrelated aquatic FCDBs and aims to provide detailed nutrient profiles of foods using best practices. An update and expansion of the uFiSh is necessary due to newly available analytical data and to expand its coverage of species including aquatic plants, products and edible parts of fish consumed not yet included.

Methods: A comprehensive literature search was performed to compile original analytical data published in peer-reviewed articles and laboratory reports since 2016. In addition, the scope of the uFiSh database was expanded to include a greater diversity of aquatic foods, for example, small-sized fish species, seaweed, and lesser consumed foods such as sea urchin. Data management, including evaluation, compilation and documentation adhere to FAO/INFOODS guidelines and international standards. Data from various sources are aggregated aiming to provide a complete set of compositional values for the species and nutrients of interest, while missing data are borrowed from national/regional FCDBs.

Results: An analysis of around 200 new data sources will be presented, including quality evaluation, alongside preliminary results of compiled nutrient data of emerging aquatic foods, such as smoked and dried small pelagic species. Data gaps for the foods that have been prioritized for inclusion in uFiSh will be highlighted.

Conclusions: The update and expansion of uFiSh will enhance the global availability of accurate compositional data for aquatic foods. Such data can also contribute to the expansion of other complementary aquatic FCDBs, as well as national and regional FCDBs, enabling better calculation of nutrient intakes from aquatic foods, and their integration into programmes and policies. Additionally, this work will highlight existing data gaps for selected aquatic foods where new analytical data is needed to improve the knowledge related to these species.

Keywords: food composition, FAO/INFOODS, nutrient intake, aquatic foods, fish

(O1.2) Establishing an EFSA open-access European Food Composition Database (EU FCDB) in Europe

Paul Finglas[1], Mark Roe[1], Sian Astley[1], Agi Kadvan[2], Jelena Milesevic[2], Helena Soares Costa[3], Maria Graca Dias[3], Ido Toxopeu[4], Anastasia Livaniou[5], Karl Presser[6], Joanne Czack[7], Heli Reinivuo[8]

[1]EuroFIR AISBL, Belgium; [2]Capacity Development in Nutrition (CAPNUTRA), Serbia; [3]National Health Institute Dr. Ricardo Jorge, Portugal; [4]National Institute for Public Health and the Environment (RIVM), Netherlands; [5]European Food Safety Authority (EFSA), Italy; [6]Promotec GmbH, Switzerland; [7]Promotec Poland, Poland; [8]Finnish Institute for Health and Welfare, Finland.

Background and objectives: The establishment of an EFSA (European Food Safety Authority) open-access European food composition database (EU FCDB) represents a critical advancement in standardising and harmonising food composition data across Europe. The EFSA EU FCDB aims to provide high-quality, comprehensive, and regularly updated nutritional data to support public health policies, dietary assessments, food safety regulations, and risk assessments. By offering a centralised and scientifically robust resource, supported by national compilers, it ensures consistency in nutrient data across Member States and enhances the accuracy of dietary intake evaluations. It also fosters cooperation between EFSA, international networks, and data users.

Methods: Key components include the integration of sixteen national food composition datasets in Europe, adherence to standardised methodologies for data collection and quality assurance, and incorporation of analytical, calculated, and estimated values for the nutrient content of key foods, fortified products, and dietary supplements. Addressing challenges in data completeness and consistency has necessitated use of validated recipe calculations, yield and retention factors, and imputation methods for missing values. Additionally, the project advocates for identification and prioritisation of key foods, ensuring representation of the most nutritionally significant foods. Expanding food classification coverage is also vital to accommodate emerging trends such as plant-based diets, reformulated products, novel food sources, and other datasets such as those describing climate impact of foods and food systems.

Results: Technical solutions for data submission, retrieval, and interoperability are fundamental for success. Recommendations include implementing standardised data formats using FoodEx2, developing automated validation and harmonisation, and providing mechanisms for downloading. These improvements will support stakeholders by enabling integration of data into dietary monitoring tools, risk assessment models, and public health surveillance systems.

Conclusions: The EFSA EU FCDB will serve as a pivotal resource for researchers, policymakers, public health authorities, and industry professionals, facilitating evidence-based decision-making, nutrition policy development, and consumer education. By fostering data transparency, accessibility, and methodological rigor, this database can significantly enhance the accuracy of dietary intake assessments and contribute to improved nutritional monitoring, food safety measures, and public health outcomes across Europe.
Acknowledgements: This work was funded under NP/EFSA/IDATA/2022/01.

Keywords: food composition database; food data; data quality; database quality; food coding; European activities

(O1.3) *Development of a Nepali Food Composition Database with integrated dietary intake calculator*

Praju Adhikari[1], Bidhya Acharya Adhikari[1], Sabina Sigdel[2], Tarja I Kinnunen[1]

[1]Tampere University, Finland; [2]Tribhuvan University, Nepal.

Background and objectives: Country specific food composition data are a fundamental tool in nutritional assessment, guiding public health policies, and food and agricultural industry. Development of a Food Composition Database (FCD) is crucial but demanding, even to a greater extent in resource scarce country like Nepal. The existing Food Composition Table (FCT) of Nepal has analytical values of 15 components for limited number of raw food items. The nutrient information on recipes and composite dishes, which are the key component of a diet, is hardly available in the existing Nepali FCT. As a part of the project, Strengthening Nutrition Education and Research Capacity in Universities in Nepal (NERC), our primary objective is to develop a new electronic Nepali FCD which includes approximately 40 nutrient components for Nepali food items, particularly, recipes. A dietary intake calculator is integrated into the FCD.

Methods: Given the geographical proximity and the fact that many food items in the Nepali market are imported from India, the analytical values for raw ingredients have been obtained from comprehensive Indian FCT. Food items not available in Indian FCT have been borrowed from other FCTs. Scientific literature and theses are sources of analytical information on indigenous and local foods. Nutrient values of cooked foods and dishes, which make up the largest portion of the database, are calculated and compiled using the International Network of Food Data Systems guidelines. The intake calculator integrated in the database is an Excel-based interface with automated features, and it allows manual entry of food intake data for multiple days. For dietary intake calculation, the density and weight of food items are compiled using published data, and standardized household measures are used.

Results: The electronic Nepali FCD will have comprehensive nutrient values for approximately 1000 food items including raw foods, cooked foods and their variations. The database will include most commonly consumed foods, also indigenous foods and processed foods. The dietary intake calculator is easy to use and will be freely available later. The nutrient intake report can be exported and stored for further research.

Conclusions: The new Nepali FCD with an integrated dietary calculation interface will be crucial for capacity building for nutrition research in Nepal. The intake calculator will allow real-time offline data entry, which is beneficial especially in rural areas with very limited resources. Better quality nutrition data will help planning targeted nutrition and health policies in Nepal.

Keywords: food composition, food composition database, dietary intake calculator, nutrient intake, Nepal

(O1.4) *An expert consensus framework for a database on ileal amino acid digestibility and protein quality scoring from foods consumed by humans*

Maria Xipsiti[1], Victor Owino[2], Daniel Tome[3], Claire Gaudichon[3], Juliane Calvez[3], Rajavel Elango[4], Anura Kurpad[5], Suzanne Hodgkinson[6], Isidra Recio[7], Shruti Shertudke[2], Hans Stein[8], Antonis Vlassopoulos[9]

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Background and objectives: Food Protein Quality is best measured by the amino acid scoring that relates their indispensable amino acid content to a reference profile after correction for digestibility. Digestibility is measured at the terminal ileum for calculation of the ileal Protein Digestibility Corrected Amino Acid Score (ileal-PDCAAS) and the Digestible Indispensable Amino Acid Score (DIAAS). In 2022, the Food and Agriculture Organisation (FAO) and the International Atomic Energy Agency (IAEA) decided to create a database on amino acid oro-ileal digestibility for protein quality scoring of human foods.

Methods: The 2022 FAO/IAEA Technical Meeting recommended the collection of protein and amino acids oro-ileal digestibility data obtained in vivo in humans, pigs and rats. A systematic review was carried out using bibliographic databases (Scopus, Web of Science, PubMed Central) to the end of November 2024. An FAO/IAEA technical advisory group was held in March 2024, and an expert meeting held in November 2024 to guide the database construction and architecture and define the inclusion criteria.

Results: A total of 5,313 published articles were identified, of which 1,088 were eligible after title and abstract screening, and a final ~550 full text articles were included for data extraction. The database included food description (name, food group, origin, seasonality, processing etc.), protein and amino acid content (per 100g food and per g of protein), moisture content, protein and amino acid ileal digestibility, and ileal score calculations (ileal-PDCAAS, DIAAS) by age groups. Data on the metabolic availability of amino acids, measured by indicator of amino acid oxidation (IAAO), were separately included, considering that they are a different measurement.

Conclusions: The literature is sufficiently advanced to support a database on the ideal digestibility of amino acids in human foods. Standardised protocols should be used, animal data should be validated against human data, and in the future in vitro data could be included after validation. A final goal of the database is to help in the development of dietary guidelines to best ensure the protein needs of human populations.

Keywords: protein, amino acid, digestibility, food composition database

SESSION 2. New nutrient/compositional data

(O2.1) *Unlocking the nutritional and safety potential of North American seaweed and bivalves: a farmer-led, multi-omics study*

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Food + Planet, United States of America.

Background and objectives: Seaweed and bivalves are vital to sustainable food systems, offering high nutrition, low environmental impact, and economic benefits for small-scale producers. However, standardized compositional data for North American species remain limited. This study provides the most comprehensive analysis to date, covering over 20 species from smallholder farms in the Pacific, Atlantic, Gulf Coast, Hawaii, Puerto Rico, Canada, and Alaska. Using a multi-laboratory approach, we assess their nutritional composition, bioactive compounds, and food safety through -omics methodologies. Farmers retain data ownership and may choose to share findings publicly, contributing to food composition databases like INFOODS to support research, policy, and markets.

Methods: Two roundtable discussions with small-scale producers shaped the study design, prioritizing analyses most valuable to farmers, including nutrient composition, bioactives, and food safety. Samples were collected from participating farms and analysed through partnerships with the Periodic Table of Food Initiative (PTFI) and Eurofins. Analytical methods include proximate analysis, vitamin and mineral profiling, fatty acid quantification, proteomics, ionomics, metabolomics, and contaminant screening (e.g., heavy metals, PFAS). Advanced -omics techniques provide insights into bioactive compounds with potential health benefits. Farmers retain full control over data-sharing decisions.

Results: Roundtable discussions showed strong producer support, with high ratings for nutritional (4.6/5) and food safety (4.7/5) analyses. Farmers emphasized the need for rigorous data to support sales, consumer education, and regulatory compliance. Laboratory analysis is ongoing, with final results expected by April 2025. Early findings indicate promising regional variations in nutrient and bioactive profiles, particularly polyphenols, essential minerals, and omega-3s. Food safety screenings show compliance with international heavy metal and contaminant thresholds.

Conclusions: This farmer-driven study generates critical new data on North American seaweed and bivalves, reinforcing their role in sustainable diets and economic growth. The multi-laboratory approach ensures robust, regionally relevant findings that support market access, certification, and consumer education. Full data will be available by April 2025, with public sharing at farmers' discretion. If shared, findings will contribute to global food composition databases, expanding knowledge of these underutilized species.

Keywords: seaweed, bivalves, nutritional composition, food safety, farmer-led study, aquatic foods

(O2.2) *Total value of B group vitamins and L-carnitine in breast milk at different lactation period*

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Background and objectives: Besides free forms of vitamins B1, B2, B6, niacin, pantothenic acid, biotin, choline, and L-carnitine, phosphorylated or bound forms also can be found in breast mike. In order to understand their actual intake by infants, it is necessary to know the exact total value at different lactation periods.

Method: 28 colostrum samples, 21 transitional samples, and 31 mature samples were collected in Beijing and Qiqihar, additional 15 mothers were recruited and continuously sampled 7 times. Using prior established optimal conditions, accurate 1.00 mL breast milk sample was shake with 20 mmol/L ammonium formate and heated in 100 °C water bath for 30 minutes, then incubated with 5 mg of papain and 10 mg of acid phosphatase at 45 °C for 16 hours. After centrifugation, the lower - layer liquid was collected for measurement. ACQUITY UPLC and Xevo TQ - XS triple quadrupole mass spectrometer (Waters, USA) was used for qualitative and quantitative analysis, with chromatographic column HSS T3 (3.0 mm×150 mm, 1.8 μm), and mixtures of mobile phase A (2 mmol/L ammonium formate with 0.1% formic acid) and B (acetonitrile with 0.1% formic acid). The differences in thiamine, riboflavin, nicotinamide, niacin, pantothenic acid, pyridoxine, pyridoxal, pyridoxamine, biotin, choline, and L-carnitine content before and after enzymatic hydrolysis, and the change of the level in breast milk at different lactation stages were calculated.

Results: No significant differences in L-carnitine, nicotinamide, and pantothenic acid were found before and after enzymatic treatment. While more than 50% of choline, thiamine, riboflavin, biotin, and pyridoxal were released after enzymatic hydrolysis. The change of vitamin B both within and between mothers at different stages were similar. The average total value of thiamine, riboflavin, vitamin B3, vitamin B6, pantothenic acid, biotin, choline and L – carnitine in colostrum was respectively 16.6μg/L, 0.423 mg/L, 0.913 mg/L, 7.22μg/L, 1.75 mg/L, 12.2μg/L, 124 mg/L and 12.9 mg/L. With the prolongation of lactation, the level of choline and L-carnitine gradually decreased to 93.0 mg/L and 3.7 mg/L. The thiamin and vitamin B6 level would increase up to 100μg/L and 51.2 mg/L. Pyridoxal and pyridoxamine were the main isomers in breast milk, inter-conversion might be occurred between them. Pyridoxine could only be found in a few samples. Niacin was the main isomer in breast milk, counting >95% of vitamin B3, which increased rapidly in 2 weeks and slightly decreased to stable level. The level of pantothenic acid and biotin seemed to have no change, while riboflavin varied with certain uncertainty.

Conclusions: This study gives total value of vitamin B and carnitine, which is useful for examining the adequate intake for infants.

Keywords: vitamin B, L-carnitine, breast milk, UPLC-MS/MS, enzymatic hydrolysis

(O2.3) *Development of Khmer mixed dish compositional data from observed recipes collected by Cambodian women living in Cambodia*

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[1]University of Newcastle, Australia; [2]Curtin University, Australia.

Background and objectives: Poor quality diets among Cambodian women are characterized by low dietary diversity. This contributes to a double burden of malnutrition with high prevalence of nutrient deficiencies like anemia co-existing with escalating overweight/obesity. Dietary assessment to monitor nutrient intake informs strategies to improve nutritional status. Quantifying nutrient data of Cambodian women is highly challenging without a comprehensive Cambodian-specific food composition database (C-FCD) and culturally specific mixed dishes which account for half of their dietary intake. There is no recipe data for commonly consumed Khmer dishes prepared by Cambodian women. Cambodia's communal eating styles from shared plates within multigenerational households also adds complexity to collecting individual dietary intakes. This study aimed to identify ingredients and nutrient profiles for mixed dish recipes collected from a sample of Cambodian women using image-voice methods and compare these with standard recipes from a compiled C-FCD.

Methods: Images and voice recordings of mixed dish recipes were collected via a specially designed smartphone dietary assessment application from 119 Cambodian women living in Siem Reap province, Cambodia. Mixed dishes were categorized by Khmer name, dish type, and ingredients, then tallied to identify the most common recipes. Ingredient quantities for each recipe were calculated, then a consolidated observed recipe (COR) was created using ingredient medians. The nutrient profile of each COR was calculated using INFOODS' template for recipe calculation. (5) Each COR was compared to the most similar standard recipe that was collated for a C-FCD from recipe books, online recipes or dictated from Cambodian women.

Results: Twenty-seven COR were created from image-voice data, representing 58% of mixed dishes consumed by Cambodian women. Comparing COR against the most similar standard recipe identified that 15 COR had no similar standard recipe, while 12 demonstrated substantial differences to the standard recipe ingredients and nutrient profile, generally being higher in fat, vitamin A, thiamin and vitamin B12 but lower in protein, iron, potassium and zinc than standard recipes.

Conclusions: Collection of image-voice recipe data from real-world settings can improve accuracy of dietary intake assessment. The 27 commonly consumed mixed-dish recipes identified in the current study are available for addition to the C-FCD to enhance accuracy of dietary assessment in Cambodia and thereby inform dietary interventions aimed at improving diet quality of families predominantly engaging in complex mixed dish, shared plate eating.

Keywords: dietary assessment, Cambodian women, Khmer traditional recipes, mixed dishes, recipe standardization

(O2.4) *Determining the nutrient composition of foods commonly consumed by Indians in South Africa*

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University of Pretoria, South Africa.

Background and objectives: The Indian population in South Africa makes up just under 3% of the population. Diabetes and ischaemic heart disease are the leading cause of death in Indians, accounting for 27.4% of all mortality. Diet is an important modifiable risk factor for the Indian population, but the foods commonly consumed and their nutrient composition need to be determined to inform dietary change. This study sought to identify foods commonly consumed through an alternate methodology to conducting a resource-intensive food consumption survey, to subsequently determine the composition of selected foods.

Methods: Ethics approval was obtained from the University of Pretoria. Foods commonly consumed were identified through: 1) an online survey of dietetic and nutrition professionals, 2) listing the foods commonly posted on two popular Facebook Indian recipe pages, 3) inventorying foods available in markets and specialised Indian retail stores in Durban, where the majority of Indians live, 4) input from the compilers of the national food composition database, and 5) input from food, nutrition and dietetic experts from the National Department of Health and University food science/dietetic/nutrition departments.

Results: A wide variety of foods are consumed by Indians in South Africa. Some of these foods are only consumed by a smaller religious or language subgroup. A wide diversity of beans, lentils, vegetables, breads, soya/meat substitute products and snack foods (savoury and sweet) have been identified for compilation. Many foods are not in the South African Food Composition Database. Descriptions, common names and the compilation of the nutrient composition of 50 foods are currently underway. Compilation is making use of information from product labels, data borrowed from other country databases, and calculation.

Conclusions: Alternative ways to get information on foods consumed can be considered in the absence of food consumption surveys. There is still a need to understand recipes for Indian mixed dishes. The compiled information will be shared with nutrition professionals and researchers.

Keywords: food composition, Indian, South Africa, SDG2, SDG3

(O2.5) *Mineral profiling of less-known cereals using XRF and ICP- MS for sustainable nutrition in Nigeria*

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Background and objectives: Despite the rich food biodiversity in Africa, reviews and recent studies have shown that limited local cereals are consumed in Africa, and Nigeria in particular. This is partly due to a lack of research and investment to explore the nutritional and health potential of less-known cereals using modern technology. In Nigeria, White Acha (WA)/Fonio (*Digitaria exilis*), Black Acha (BA)/Fonio (*Digitaria iburua*) and Tamba/Finger Millet (FM) (*Eluesine coracana*) are amongst the least grown cereals due to their low-economic potential and lack of popularity. This research explored the mineral profile of these lesser-consumed cereals using X-Ray Fluorescence (XRF) and Inductively Coupled Plasma – Mass Spectrometry (ICP-MS) methods.

Methods: Three samples that included two different species of Acha (White Acha and Black Acha), and Tamba cereals were purchased from a central market in northern Nigeria and transported to IGFS, Belfast, UK, in airtight packaging. Samples of each of the mixed cereals were milled into flour and, 3.36g flour weighed into the XRF cup, and pressed in the XRF cup to an average height of 7.06mm with Panavise a presser. The coded pressed samples were then transferred to the Rigaku NEX CG Energy Dispersive XRF Spectrometer where the mineral contents were analysed. Additionally, 1000µg ± 50µg of each of the flour samples were weighed into an empty 50ml centrifuge tube and digested using Nitric acid, allowed to stand for an hour after adding H2O2 (30%), microwaved, and Rhodium standard (15µm/5ppb) added to the microwaved digest before placing into the ThermoScientific ICP-MS (iCAP TQ) for minerals analysis. The data generated were presented using mean and standard deviation.

Results: Certain minerals per 100g edible portion showed a higher content in both methods (XRF and ICP-MS). Mg (259.83±14.85mg in BA – XRF analysis; 1732.21±127.73mg in FM - ICP-MS analysis), Ca (377.37±0.81mg – XRF analysis compared to 1364.07±131.75mg - ICP-MS analysis of the same FM sample); Fe (18.53±0.15mg – XRF analysis compared to 227.69±73.60mg - ICP-MS analysis of the same BA sample); Zn (2.35±0.12mg – XRF analysis compared to 20.5±0.52mg - ICP-MS analysis of the same BA sample), and Iodine (0.64±0.11mg - ICP-MS analysis of BA).

Conclusions: The results from this study have shown some striking outcomes that require further exploration. However, there is a large mean difference in the measurements using both methods on the same sample. Exploring and embracing quick and less expensive methods like XRF is highly welcome with further understanding on how to relate its results to other methods. In addition, a promising mineral profile has been determined by these methods on the cereal samples that can be used to encourage their consumption and production for a sustainable diet in Nigeria and the world at large.

Keywords: less-known cereals, XRF, ICP-MS, white acha (*Digitaria exilis*), black acha (*Digitaria iburua*), tamba/finger millet (*Eluesine coracana*), mineral profile

SESSION 3. Biodiversity and food composition

(O3.1) *Effects of biodiversity on green tea metabolites: a seven-year LC-MS comparison study and the estimation of scaling laws using rarefaction*

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Background and objectives: Biodiversity and ecological interactions are known to affect plant metabolites and eventually the health of consumers. Recent studies have led to forming a comprehensive view that the regulation of the human immune system and long-term health are largely supported by ecological interactions. We hypothesized that culture conditions of tea plants under high and low ecological interactions affect metabolic profile of green coarse tea (bancha), and compounds induced by high ecological interactions may contain more diversity and expression of secondary metabolite with health-protective compounds.

Methods: We analysed LC-MS metabolic profiles of green coarse tea (bancha) samples through seven years and extracted distinctive features that characterize two different culture conditions with high and low plant diversity. We performed principal component analysis (PCA) to identify system-level differences between bancha metabolites grown with high and low ecological interactions and obtained a common list of chemical formulae that characterized each sample group regardless of interannual variation. At the same time, we also identified compounds specific to each sample of the same year. We referred to the KEGG BRITE database to infer the ontology of characteristic metabolites. We further applied the rarefaction theory to evaluate the inter-annual variation and estimate the population distribution of bancha metabolite.

Results: A PCA parameter with multiple compounds could separate the culture conditions, while individual compounds alone could not explain the difference. Ontological characterization showed that the metabolomic features of bancha grown under a high ecological interaction environment contained more immune-system related substances with anti-inflammatory and anti-oxidative functions, which is consistent with the amelioration of rehabilitation performance in another study using a single-year part of the same tea samples. Rarefaction analysis revealed the year-wise fluctuation and the seven-year saturation dynamics of metabolite diversity, as well as the coverage-based rarefaction estimation of the population distribution.

Conclusions: This study provides the estimate of culture surface-wise and temporal scale-wise metabolite diversity of green tea based on the difference of culture condition with high and low ecological interactions. It suggests that high biodiversity is key to the enhanced expression of health-protective phytochemicals, potentially contributing to human metabolic health in the Planetary Health framework.

Keywords: tea metabolite, polyculture, LC-MS, chemical onthology, rarefaction

(O3.2) *Assessing biodiversity food richness through dietary surveys: a cost-benefit approach to guide the collection of consumption and composition data at below species level in an Italian case study*

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Background and objectives: In the framework of food system sustainability, the biodiversity of plant foods consumption needs to be assessed and boosted to prevent the on-going worldwide biodiversity erosion and to provide populations with a cocktail of nutrients and bioactive substances. Food composition tables and dietary survey tools differ in their biodiversity richness. The objective of the present study is to illustrate an approach to prioritize data gaps to be filling so that surveys can better capture the biodiversity richness of diets.

Methods: The most recent Italian Food Composition Tables (IFCT) and the food list used in the last Italian food consumption survey (IV SCAI), both developed by CREA Food and Nutrition Centre, were assessed for their biodiversity richness. Plant foods were considered at species level and below species level (cultivars and varieties).

Results: The food list of the IV SCAI survey includes 129 species of plant foods, including 6 Neglected or Underutilized Species (NUS). For 22 of these species, foods are described at below species level for a total of 48 entries. The IV SCAI food list is mainly linked with IFCT and other food composition data. The current IFCT contains entries for 113 species of plant foods, including 4 NUS. For 27 of these species, foods are described at below species level for a total of 79 entries. Fifty plant foods present in the IV SCAI food list are not present in the IFCT; their analytical determination could be a priority for the next versions of IFCT. Additional below species entries to be considered in future dietary tools were identified based on feasibility and cost/benefit. The fruit and vegetables categories were prioritized due to their high number of species (52 and 34, respectively) and below species (32 and 42, respectively) in the IFCT. Among these, the fresh fruit sub-category was prioritized due to the few below species entries in the IV SCAI food list. Among the 7 fruits representing more than 5% of total fresh fruit consumption, apples, oranges and pears were chosen due to their high number of below species in the IFCT (6, 7 and 5, respectively) and their rather easy identification by colour/shape. A Food Biodiversity Questionnaire with 18 fruit pictures could then be considered for adoption in addition to the currently used recall/record dietary tool; its filling requires less than 10 minutes.

Conclusions: Better data on the biodiversity of diets is needed to develop better food policies aimed at restoring the production and consumption of biodiverse plant foods. The illustrated approach may contribute to advance data gaps filling in food consumption and composition.

Keywords: food composition, food consumption, biodiversity, plant foods, dietary survey tool

(O3.3) *The Periodic Table of Initiative (PTFI): mapping food composition to empower human and planetary health solutions*

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Background and objectives: Food composition data and supporting metadata are foundational for designing effective food system solutions to advance human and planetary health. The Periodic Table of Food Initiative (PTFI) is a science-to-action platform that provides standardized multi-omics tools, data, and training to a global ecosystem to characterize food composition of the world's edible biodiversity. This presentation will provide an overview of the PTFI and applications for empowering healthy diets from sustainable food systems.

Methods: The PTFI data platform is designed to build the evidence base to answer: (1) What is in food? (2) How does this vary based on how and where food is produced and processed? (3) What are the implications for people and the planet? The PTFI is addressing these questions by developing and distributing standardized multi-omics tools (Ionomics, Lipidomics, Metabolomics, and Glycomics) and providing resulting data in open-access data platforms.

Results: The PTFI has built an ecosystem of 25+ labs with tools leveraged in 20+ research projects on regenerative agriculture, school meals, and Food is Medicine, including those led by Good Food Fellows. Data from the first 500 reference foods from 200+ species highlight food's incredible biomolecular diversity including 60 fibre components, 3,000+ lipids, 20,000+ small biomolecules (bioactives), and 420,000 unique protein components. Data from PTFI research projects provide evidence on the impacts of agricultural practices and processing on food composition.

Conclusions: The PTFI calls for leveraging food composition data coupled with associated food systems metadata for data-driven insights to inform human planetary health solutions.

Keywords: multiomics data, food composition, metadata, edible biodiversity, sustainability

(O3.4) *Nutritional evaluation of indigenous tuberous foods consumed by Meitei, Manipur, The Northeast India*

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Background and objectives: The biodiversity for food and agriculture also includes underutilised species with the potential to contribute to food and nutrition security, health, income sources, and ecosystem amenities. They are also essential because of the variety they represent in a system and are well-adapted to their local environment. The "traditional food system" includes all of the food species available to a particular community from local natural resources and the ways of their usage often associated with the culture of that community. Manipur is one of the Northeast Indian states, and Meiteis are the non-tribal indigenous people who mainly inhabit the valley area of the state. They are closely connected with their diverse surroundings and resources, mainly plants and animals, in many ways. Many less familiar indigenous foods are integral parts of their daily diet. However, the nutritional composition of them is not studied.

Methods: Six indigenous roots and tubers were collected from two different districts of Manipur, cleaned using distilled water, and the non-edible portion removed. The edible portions were homogenized and used for various nutrient analyses. Proximate compositions were analysed using the AOAC official method of analysis. The minerals and heavy metals were quantified using Flame Atomic Absorption Spectrometry and ICP-MS, respectively, after digesting using supra-pure nitric acid and hydrogen peroxide (3:1 v/v). The vitamins were quantitatively determined using HPLC techniques.

Results: *Nymphaea rubra* had the highest content of protein (13.29%), ash (5.80%), fat (1.40%) and total dietary fibre (10.73%). The highest total folate content was found in *Sagittaria sagiltifolia* (238 µg/100 g), while *Alocasia cucullata* had the highest vitamin C (5.45 mg/100 g). The ranges of the other B vitamins' content in roots and tubers were 0.01–0.06 (B1), 0.03–0.09 (B2), 0.22–1.38 (B3), 0.2–0.9 (B5) and 0.02–0.26 (B6) mg/100g. The vitamin E (α tocopherol equivalent) and vitamin K content ranged from 0.01 to 1.17 and 1.36 to 26.35 µg/100g, respectively. *Alocasia cucullata* had the highest total carotenoids (141 µg/100g), while *Colocasia esculenta* had the highest β-carotene (32.1 µg/ 100g). All the trace elements analysed (Cd, Cr, Co, Pb, Mo, Ni, Li, Hg, As, Se and Sb) among the roots and tubers were less than 20 µg/100g.

Conclusions: Incorporation of these nutrient-rich tubers not only improves dietary diversity but also elevates nutritional security. Proper utilization of these tuber species also enhances the potential to get sustainable income for people with the least risk of ecological disaster.

Keywords: roots and tuber, indigenous foods, minerals and heavy metals, vitamin

SESSION 4. New databases and approaches

(KEYNOTE.2) *Establishment of Asian Food Composition Database by AFACI project of Korea RDA*

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Background and objectives: We established Asian Food Composition Database (DB) through Asian Food and Cooperation Initiative (AFACI) project for the purpose of production of nutritional information of major agricultural products in Asia and preserving food culture and biodiversity.

Methods: From 2021 to 2024, 11~80 nutritional composition data on 100~123 major consumer foods of each 12 Asian country (Bangladesh, Bhutan, Cambodia, Indonesia, Kyrgyzstan, Laos, Mongolia, Nepal, Philippines, Sri Lanka, Thailand, and Vietnam) were analysed and accumulated by each country. And the produced data were verified food name and component value for accuracy, consistency, and completeness in accordance with the FAO/INFOODS guidelines, and reviewed the validity of the quantitative values of component for each food through food nutrition specialists in Korea. In addition food groups, food names, notation unit, and display forms were standardized and included.

Results: In this DB, 923 food items were classified into 20 food groups, and English and native language food names, scientific names, varieties, and country codes were listed. The DB includes over ten thousand data in 16 composition items including energy, moisture, protein, fat, ash, carbohydrates, 5 minerals (Ca, K, P, Na, Fe), 4 vitamins (A, B1, B2, C) and refuse ratio information. We made this DB public through the website for broad utilisation.

Conclusions: Through this project, these food composition information will be effective in improving the systematic nutritional management for Asian people, and contribute to the promotion of the food industry in the Asian region. Furthermore, through the second project for three years from 2024, it plans to expand the target foods of 100 items per country and improve the quality of information by strengthening the professional analysis capabilities.

Keywords: Asia, food, composition, database

(O4.1) *Expansion of Food Composition Database for Bangladesh: challenges and experiences in low- and middle-income countries*

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Background and objectives: Accurate food composition data are crucial for assessing diets, identifying nutrient gaps, shaping guidelines, and studying diet-disease links. In many LMICs, including Bangladesh, outdated databases hinder research and policy. After 37 years, Bangladesh has updated its Food Composition Table (FCT) and developed its first Food Composition Database (FCDB). Expanding the database with analytical data on new, local varieties and processed foods is vital to capturing the country's diverse food culture and biodiversity. This project aims to expand Bangladesh's FCDB by adding nutrient data on key agricultural and processed foods for the Asian Food Composition Database (AFCD). It enhances data accuracy and addresses LMICs' challenges in maintaining updated nutrition information.

Methods: The prioritized 100-food list for the compositional analysis was prepared through key food identification, variety inclusion, and processed food inclusion. The samples were collected from five wholesale market clusters of Dhaka city and the Bangladesh Agriculture Research Institute (BARI). The edible portion of samples was homogenized with liquid nitrogen to convert them into powder form and was kept at -80ºC freezer before nutrient analysis. Moisture, ash, fat, and total dietary fibre were determined gravimetrically, according to the AOAC Official Methods, protein by the Kjeldahl method, B-group vitamins using HPLC, and mineral contents by ICP-OES. All the parameters were analysed in triplicates and recorded as fresh weight and mean ± standard deviation.

Results: We have analysed 100 food items from different food groups. The nutrients included a) Proximate: moisture, ash, protein, fat, dietary fibre, carbohydrate, Kcal; b) Vitamins: thiamine, riboflavin, niacin, vit B6, folate, vit B12, vit C, vit A; c) Minerals: Calcium, Iron, Magnesium, Phosphorus, Potassium, Sodium, Zinc. We also analysed amino acids and fatty acids for fish samples. Experts from the FAO and AFACI audited the analytical data. The audited data will be included in the AFCD database and the second version of the Bangladeshi FCT. The project also produced an SOP for sample preparation and nutrient analysis. Challenges included limited laboratory facilities, food composition variability, and resource constraints. Standardization with AFCD improved data integration and consistency. The experiences from this project underscore the importance of sustained investment in analytical capacity, regional collaboration, and policy support to strengthen FCDB in LMICs.

Conclusions: The analytical data will support the AFCD project and expand the FCDB. Despite resource constraints and food variability in LMICs, regional collaboration and standardization could be effective.

Keywords: food composition table, food composition database, challenges in nutrient analysis, Bangladesh, Asian Food Composition Database

(O4.2) *Updating the Ethiopian Food Composition Table: methodological approaches and future directions*

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Background and objectives: Country-specific Food Composition Tables (FCTs) are scarce or outdated in many low- and middle-income countries. It has been more than two decades since the latest version of the Ethiopian FCT (EFCT) was published. The current update is necessary due to the introduction of new food items (such as processed, imported, and wild foods), changes in dietary patterns over the decades, advancements in analytical methods, and the absence of certain nutrient values (e.g., dietary fibre and folate) in the old FCTs. The Food and Agriculture Organization of the United Nations (FAO) and the Ethiopian Public Health Institute (EPHI) collaborated to update the EFCT, incorporating new data on Ethiopian foods. traditional/indigenous and modern foods/recipes and filing missing data in the existing FCTs.

Methods: The existing national FCTs (part I to IV) were assessed, reviewed, and updated using new analytical data on Ethiopian foods compiled from various sources according to FAO/INFOODS standards and guidelines. Nutrient analyses were conducted for prioritized traditional/indigenous and modern foods and fermented foods. A national representative sampling plan was conducted by collecting composite samples at subnational and national levels. Additionally, recipe details were collected for mixed dishes at the EPHI experimental kitchen using professional chefs. Nutrient values for cooked foods (single-ingredient recipes) and mixed dishes were calculated, considering yield and nutrient retention factors accordingly.

Results: A total of 727 food entries were presented including raw foods (n=369), cooked foods (n=213), and mixed dishes (n=145). New analytical data was generated for 108 foods based on a national sampling plan. A total of 68 components were reported in the updated EFCT. Both the User Guide and Condensed FCT and the Excel Datasheets will be freely available at the FAO/INFOODS and EPHI websites making it easily accessible in a user-friendly format to expand its use and facilitate continuous update.

Conclusions: The updated EFCT represents an updated and expanded version of the previous FCTs, including new data generated for the FCT and good quality analytical data publicly available for Ethiopian foods. The expansion of the EFCT in terms of foods and nutrients together with an easy and user-friendly access makes it more appropriate to help to better understand diet composition in the country, promote food-based approaches and strengthen food and nutrition research.

Keywords: food composition, database, Ethiopian foods

(O4.3) *Development of a food composition database in Mongolia*

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Background and objectives: As per the most recent statistics, 28.4% of the Mongolian population live below the poverty line and approximately 22% do not have sufficient dietary energy regularly to lead a normal, active, and healthy life. In 2017 The last National Nutritional Status V report focused on micronutrient deficiencies that are common in all ages, especially in infants, young children, and pregnant women. The highest prevalence of micronutrient deficiencies was in children under 5 years of age with 27% classified as anaemia, 21% as iron-deficient, 70% as insufficient in vitamin A and 90% as deficient in vitamin D. Consequently, it is necessary to consume a wide range of nutritious and high-quality foods in the daily diet. In Mongolia, a food composition table was established in 1997, but it only contains a limited number of products and types of foods and has not been updated for more than 20 years. Therefore, creating a comprehensive "Food composition database" is vital for improving the nutritional situation of the population, promoting proper nutrition, and ensuring accurate information for food producers and customers. The objective was to improve Mongolia's capacity to develop a food composition database.

Methods: In 2021-2024, completed from 13 provinces and the food industry 15 companies collected 108 food items on major production of plant and animal origins, strategies, and export foods. A total of 17 nutrients such as Moisture, Fat, Protein, Carbohydrates, Ash, Folic Acid, Vitamins B1, B2, and C, Minerals (Na, Ca, K, P, Fe, Mg), Dietary Fibre, Fatty asides are analysed and the sample information and database have been developed according to the requirements of the INFOOD by FAO and guidelines for the Korean food composition database.

Results: The collection of samples related to Mongolian food culture and traditional products, including dried yak meat, fermented camel milk, yak ghee, fermented mare milk cumis, and processed dairy products from different provinces. Based on the results of the analysis a total of 1808 nutrients of 108 items in 12 food groups (Cereals and cereal products-18, Starchy roots and starch products-2, Pulses-2, Nuts and Seeds-6, Vegetables-25, Fruits-16, Meat and meat products-10, Eggs-1, Fish and fish products-2, Milk and milk products-22, Seasonings-2, Prepared foods-2) and developed the sample information and food composition database/table for Mongolia.

Conclusions: These results will be important for improving the nutritional situation of the population, supporting adequate (proper) nutrition, controlling of real situation of nutrition value, also will be correct information for food producers as well for the customers.

Keywords: micronutrient deficiencies, traditional products, nutrition, food composition database

SESSION 5. Data methodology and dissemination

(O5.1) *The new era of technical solutions of food composition data management, dietary data collection and dietary intake calculation in national dietary surveys: an example from Finland*

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Background and objectives: Efficient technical solutions to manage food composition data (FCD) and integrate dietary data collection and calculation tools with FCD is critical to replace the technically outdated software. Without these solutions, the continuation of national nutrition monitoring and risk assessment practices and the harmonization of survey methodologies across countries are challenged. Our aim is to describe the process of adopting and tailor-making the FCD management software FoodCASE and the development of software for dietary data entry and calculation to reliably serve nutrition monitoring and research in the coming years.

Methods: Migration of food composition data from old to new database required comparison of data models between existing FCD and FoodCASE. Migration included also food supplements. New features to FoodCASE were planned for better compliance with existing FCD webpages.

A new dietary data entering, and calculation software Finmeal was developed by using an application programming interface (API) between the software and FoodCASE to ensure full interoperation. In the development of Finmeal, we considered all classical dietary assessment methods, including interviewer-driven 24-hour dietary recalls, food records, and semi-quantitative food frequency questionnaires (FFQ). Moreover, the usability of the software outside the institute as well as data protection perspectives were considered.

Results: The FoodCASE has now replaced the old in-house FCD management software. The migration process including the data checking, was challenging and required more time as planned. FoodCASE is widely adapted which will improve harmonisation of food composition data creating a strong foundation for dietary intake calculations. The new Finmeal software has been adopted in the ongoing Youth Nutrition Study in the entering of food consumption data and the calculation procedures for 24-hour dietary recalls. The calculation procedure has proven ability to manage large data sets, including FFQ data from large population-based surveys. Comparisons of dietary calculations between new and old software are ongoing. Careful comparisons are needed to inform reliable time trends in food consumption results.

Conclusions: Finland has succeeded in the adaption of the FoodCASE system, yet the full exploitation of this FCD management system requires continuous collaborative efforts. It is important to allocate enough resources especially for data migration phase. The interoperation of the data entry and calculation software with the FCD management system fosters new learnings that can improve the European landscape of technical solutions for efficient nutrition monitoring and risk assessment projects.

Keywords: food composition database, food composition data, food consumption, dietary assessment, data management system

(O5.2) *Fostering edible biodiversity through interoperable food composition data: a global effort to enhance human and planetary health*

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Background and objectives: The Periodic Table of Food Initiative (PTFI) is a pioneering global effort to create an open, publicly accessible database that catalogs the world's edible biodiversity through multiomics data, uncovering the vast and largely uncharted "dark matter" of food. Understanding the nutritional composition of edible biodiversity plays a key role in supporting diverse, nutrient-rich diets, as different species, varieties, and production systems contribute unique biochemical profiles that influence dietary quality. However, the lack of standardized and structured metadata in existing food composition databases limits our ability to analyse these connections. To address this challenge, we developed a standardized metadata framework that enhances the interoperability and usability of food composition data, ensuring they can be accurately aggregated, analysed, and reused to generate meaningful insights into the intricate connections between food composition, health, and sustainability.

Methods: The PTFI Core Metadata was developed as a structured framework incorporating 45 mandatory Metadata elements (1) designed to capture essential information about the food collection event (e.g., when and where the food was collected), the food specimen (a specific collected entity), and derived samples (from a parent specimen). Notably, two widely recognized ontologies, the Food Ontology (FoodOn) and the National Center for Biotechnology Information (NCBI) taxonomy, are included as part of our metadata.

Results: The PTFI Core Metadata has been implemented and released in the PTFI database MarkerLab (2), alongside multiomics data from 500 foundational foods analysed to date. The collected metadata enable comparison of food composition variation across 182 species spanning 65 food families. The power of standardized metadata collected from different projects also enables comparison between different treatments, such as processing method from 36 species (e.g., raw, processed, cooked); comparison of varying production systems (e.g., conventional, organic, wild, farmed, grain-fed, grass-fed) from 34 species; and comparison of diverse sources (e.g., field, fresh market, supermarket) across 32 species. For finer resolution metadata of field-harvested foods, we are developing an expansion module to capture agricultural practices linked to variations in food composition, ensuring scalability across food systems and applications.

Conclusions: Our standardized metadata framework, bolstered by the power of community-maintained ontologies facilitates data sharing and interoperability, and adds context to the PTFI multiomics food data, promoting a more dynamic global platform for diverse users seeking to elucidate the nutritional "dark matter" of food

Keywords: multiomics data, food composition, metadata, edible biodiversity, sustainability

(O5.3) *Bridging the data gap: expert guidelines for the reporting of analytical data in aquatic foods for use in food composition databases*

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Background and objectives: The use and application of accurate food composition data is hampered by the dearth of high-quality analytical data, including for many aquatic foods. Such data provide crucial information needed for assessing nutrient intake and informing food and nutrition policies. While this data is increasingly published in scientific journals, the lack of comprehensive descriptions and necessary information for correct interpretation hinders its use. This study aims to review published data and develop a checklist to guide authors in reporting aquatic food composition data, enhancing its visibility and end-use applications.

Methods: Published aquatic food composition data were independently reviewed by two research teams at the Food and Agriculture Organization (FAO) of the United Nations and Harvard School of Public Health (HSPH). Scientific databases were searched to retrieve relevant publications containing food composition data including aquatic foods. The scope of the queries were limited to 'seaweeds' by the FAO team and 'aquatic foods' in general by the HSPH team. The resulting data were initially screened for purpose. Further, their quality was assessed according to the international standards, such as FAO/INFOODS, and adapted EuroFIR guidelines. The data that complied with the standards were included in the food composition tables and recorded in the American Food Composition Databases (AFCD).

Results: From 167 peer-reviewed studies on seaweed composition, FAO excluded 68 % at the initial assessment. Major reasons were unclear matrix definitions and data presentation (i.e. data not presented in numerical forms but only as graphs/figures). From 917 peer-reviewed studies reviewed by HSPH, 77% were missing at least one of the following key variables: sample origin, sample year, sample processing, sample preparation, production category (i.e., wild or farmed), sample part, relative weight or employed analytical methods. These critical features, among others, are presented as a checklist to help researchers consistently report analytical data on aquatic foods.

Conclusions: Presentation and publication of data on aquatic foods adhering to the minimum-quality standards will enhance accuracy and visibility, as well as facilitate their inclusion in food composition databases. Further, these minimum-quality standards will facilitate the direct and indirect uptake and application of published data in research, development, and policy making activities regarding public health and nutrition.

Keywords: data quality, dry weight basis, food description, sampling, SDG 2

(O5.4) *Foodomics education for systems change*

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Background and objectives: Food EDU is an open-access educational platform that empowers learners across diverse disciplines and geographies to address critical challenges related to food, agriculture, health, and nutrition. The platform was created to help the global scientific community use tools and data from the Periodic Table of Food Initiative (PTFI). The primary objective of Food EDU is to empower learners and researchers from different backgrounds to address urgent challenges for human and planetary health through data-driven solutions—beginning with food composition data.

Methods: The development of the Food EDU curriculum was a collaborative and co-creative process involving experts affiliated with PTFI and other partners within the global ecosystem including PTFI Centers of Excellence, the Alliance of Bioversity and CIAT, and an expert curriculum advisory committee. This collaboration ensured that the curriculum was comprehensive and aligned with the latest research and methodologies. A landscape assessment was conducted using surveys and focus groups to better understand educational gaps, and interests of students and researchers who were in a position to onboard PTFI analytical methods.

Results: Food EDU's development of the "Foodomics and Society Course" and the "PTFI Science Trainings" has introduced learners to a groundbreaking approach to mapping the biomolecular diversity of food using multi-omics tools. The course explores different ways of knowing food and how foodomics is used to generate food composition data, revealing insights into human health, agricultural production practices, and the need for an equity-centered approach to access and benefit sharing. PTFI training covers foundational scientific principles, ethical data governance, and food sampling procedures, and includes detailed tutorials on PTFI's multi-omics tools. The curriculum is designed for university students and early career scientists in fields such as analytical chemistry, public health, nutrition, and food science and technology.

Conclusions: Food EDU is building the capacity of the Periodic Table of Food Initiative and the broader scientific community by providing accessible, high-quality education on food composition data. By equipping learners with the knowledge, skills, and societal framing necessary to apply foodomics, Food EDU is contributing to the development of data-driven solutions that address the interconnected challenges of human and planetary health. This initiative exemplifies the potential of educational platforms to drive transformative change in food systems globally.

Keywords: foodomics, planetary health, food composition, education

(O5.5) *Global food composition databases in the digital era: data attributes and FAIR data harmonization, an integrative review*

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Background and objectives: Food composition databases (FCDBs) are essential resources for characterizing, documenting, and advancing scientific understanding of food quality across the entire spectrum of edible biodiversity. This knowledge supports a wide range of applications with societal impact spanning the global food system. To maximize the utility of food composition data, FCDBs must adhere to criteria such as validated analytical methods, high-resolution metadata, and FAIR Data Principles (Findable, Accessible, Interoperable, and Reusable). However, complexity and variability in food data pose significant challenges to meeting these standards.

Methods: In this study, we conducted an integrative review of 35 data attributes across 101 FCDBs from 110 countries. The data attributes were categorized into three groups: general database information, foods and components, and FAIRness.

Results: Our findings reveal evaluated databases show substantial variability in scope and content, with the number of foods and components ranging from few to thousands. FCDBs with the highest numbers of food samples (≥1,102) and components (≥244) tend to rely on secondary data sourced from scientific articles or other FCDBs. In contrast, databases with fewer food samples and components predominantly feature primary analytical data generated in-house. Notably, only one-third of FCDBs reported data on more than 100 food components. FCDBs were infrequently updated, with web-based interfaces being updated more frequently than static tables. When assessed for FAIR compliance, all FCDBs met the criteria for Findability. However, aggregated scores for Accessibility, Interoperability, and Reusability for the reviewed FCDBs were 30, 69, and 43%, respectively.

Conclusions: These scores reflect limitations in inadequate metadata, lack of scientific naming, and unclear data reuse notices. Notably, these results are associated with country economic classification, as databases from high-income countries showed greater inclusion of primary data, web-based interfaces, more regular updates, and strong adherence to FAIR principles. Our integrative review presents the current state of FCDBs highlighting emerging opportunities and recommendations. By fostering a deeper understanding of food composition, diverse stakeholders across food systems will be better equipped to address societal challenges, leveraging data-driven solutions to support human and planetary health.

Keywords: food composition data, food quality, metadata, food components, FAIR data, nutritional database

SESSION 6. New nutrient/compositional data

(O6.1) *Changes in total fat and fatty acid content of beef, pork and lamb during the last 30 years*

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Background and objectives: The Norwegian Food Composition Table version 2020 contained energy and nutritional values of beef, pork and lamb that were up to 30 years old. During this period, the Norwegian livestock production has changed significantly. Most important is the work of breeding and development of carcass classification systems during the last 30 years, aimed at increased content of meat and less fat in beef, pork and lamb. Between 2020 and 2023, analyses of the energy and nutrient content of meat from beef, pork, and lamb were carried out. As meat and meat products are some of the main sources of fat and saturated fat (SFA) in the Norwegian diet, the objective was to study changes in the content of total fat, SFA, mono and poly unsaturated fat (MUFA and PUFA) compared to the previous analysis.

Methods: The selection of beef, pork and lamb carcasses was based on slaughter statistics from the Norwegian Meat and Poultry Research Centre. The data is collected from all Norwegian abattoirs. For each type of livestock, ten to twelve carcasses were chosen. The selection of cuts and types of minced meat was based on today's commercial cutting pattern. Each cut from the respective type of livestock was mixed into batches from which analyses were carried out. Nine cuts and minced meat from beef were comparable between the old and new data. For pork, six cuts were comparable, while eight cuts were compared to lamb. The changes in content were based on the total changes in the content of fat and fatty acids per 100 g of cut.

Results: For beef, total fat content had increased by 14 percent, SFA increased by 23 percent, MUFA by 31 percent, while the content of PUFA had not changed. The carcass weight has increased by 40 kg between 1996 and 2021. The corresponding figures for pork were 25 percent decrease for total fat, 24 percent decrease for SFA, 19 percent decrease in MUFA and 39 percent decrease in PUFA. While there was an increase in the total fat content of lean cuts such as inside round, pork loin and tenderloin, there was a reduction in the content of the traditionally fattier cuts such as pork rib chops and pork rib. Total fat content in comparable cuts of lamb was reduced by 28 percent. SFA was reduced by 24 percent, while the reduction in MUFA was 23 percent and 27 percent in PUFA.

Conclusions: Focused effort in Norwegian livestock production has reduced the fat content of Norwegian pork and lamb meat. However, despite efforts to increase the meat content and reduce fat in beef, the fat content has increased. This is first and foremost due to an adaptation to the changes in demand of beef and increased carcass weight.

Keywords: meat and meat products, nutritional analysis, food composition database, fat and fatty acids content

(O6.2) *Amino acid content and protein quality of South African processed meat*

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Background and objectives: In sub-Saharan Africa (SSA), both food systems and dietary patterns are undergoing rapid changes due to urbanisation, increased income, and employment changes. Increased participation in work outside the home, has led more and more men and women to choose processed food and dining out to reduce the labour-intensive tasks of home food processing and preparation. This has contributed to the increased consumption of processed meat in South Africa. At the same time, protein-energy malnutrition (PEM) remains a significant issue, particularly in low-income communities. No prior study has assessed the amino acid content and protein quality of South African processed meat products. Existing data on their nutritional composition are primarily sourced from international food composition databases. This study aimed to evaluate the amino acid composition and protein quality of commonly consumed processed meat products in South Africa.

Methods: Eight widely consumed processed meat products were analysed for crude protein content using the Dumas-method and 6.25 as the nitrogen-to-protein conversion factor (NPCF). The amino acid composition was determined using high-performance liquid chromatography with fluorescence detection. Digestible indispensable amino acid scores (DIAAS) was calculated using published data on amino acids' digestibility to evaluate the protein quality of these foods.

Results: Crude protein content ranged from 8.31 to 15.9 g/100g, while protein as the "sum of amino acid residue" varied from 6.93 to 13.5 g/100g. The nitrogen-to-protein conversion factor overestimated protein content by more than 10% in these processed meat products. The IAA:DAA ratio ranged from 0.5 to 0.7. Among the analysed products, frozen beef sausages ranked lowest in DIAAS (75%, 72%, and 69% for adults, adolescents, and children, respectively). Threonine was identified as the most limiting amino acid.

Conclusions: The processed meat products analysed in this study can serve as a source of protein. However, as processed meat has been identified as a contributor to high sodium and saturated fat, consumer education on lean protein sources and moderation in processed meat consumption is essential.

Keywords: processed meat, protein, amino acids, digestible indispensable amino acid scores

(O6.3) *The chemistry of edible insects – the impact of chitin on nutritional analysis*

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Background and objectives: There are scarcely analytical results on edible insects in compositional databases. Four insects are authorized in EU as novel food and safety assessments for further eight species are ongoing. Insects must be used whole, i.e. no parts may be removed. The analytical method selection used for insects may have a great impact on protein and dietary fibre results. Kjeldahl method is widely used in total nitrogen analysis of food. To calculate the protein content, the nitrogen result is typically multiplied by a nitrogen-to-protein factor of 6.25. However, this general factor or the specific factors determined by Jones in 1941 are not applicable to all foods. Especially novel foods, such as edible insects, don't have established factors. Insects contain chitin which is the primary component of their exoskeleton. The building blocks of chitin are N-acetylglucosamine units. Thus, in insects, there is another source of nitrogen in addition to the amino acids in the protein. Therefore, the amount of protein in insects is overestimated if the general factor is used. Chitin is classified as dietary fibre. The nitrogen in chitin also affects the dietary fibre analysis if AOAC methods are used, because the dietary fibre result is corrected by residual protein. If the protein content is overestimated, the amount of dietary fibre will be underestimated. Chitin can also be measured using another method based on acetyl group determination, in which case, the factor used does not have an impact on the results. However, for edible insects, it may be unclear which methods should be used. The objective of this study was to determine nitrogen-to-protein factors of house cricket (*Acheta domesticus*) and honeybee drone broods (*Apis mellifera* L.). The aim was also to investigate the impact of the analytical method on chitin content results.

Methods: Nitrogen-to-protein factor was calculated by dividing the sum of amino acid residues by the total nitrogen. Total nitrogen was analysed by Kjeldahl method, amino acids according to EC No 152/2009 (annex III), dietary fibre according to AOAC 2022.01, and chitin as described by Hahn et al. (2018).

Results: The nitrogen-to protein factor of both insects was around 5. The amount of chitin differed depending on whether the analysis was performed with a method for dietary fibre or chitin. When measured by the dietary fibre method, the amount of chitin was overestimated.

Conclusions: The nitrogen-to-protein conversion factor of edible insects should be around 5 to avoid overestimation of protein content. In addition to these results, literature should be used to determine the exact factor. Furthermore, particular attention should be paid to the methods by which edible insects are analysed.

Keywords: nitrogen-to-protein factor, edible insects, chitin, dietary fibre, food composition database

(O6.4) *Insights on effect of hydrothermal processing on millet antinutrients and mineral bioavailability*

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Background and objectives: Millets are primaeval staple crops which were consumed by humans much before the emergence of rice and wheat. Though these "Nutri-cereals" are good source of carbohydrates, protein, dietary fibre, minerals and vitamins but they also contain anti-nutrients like phytic acid (myo-inositol hexaphosphate; IP6) tannins and polyphenols which are known to bind essential dietary minerals and hinder their absorption. It is well known that processing methods like soaking, cooking, fermentation, etc. are effective in removing antinutrients thereby improving mineral bioavailability. The present study aims to investigate the effect of hydrothermal processing on comprehensive nutritional profile of minor millets of India.

Methods: Official AOAC and validated analytical methods were used for quantification.

Results: Processing of millets doesn't show significant alteration in macronutrient profile while 11 to 50% decrease was observed within B-complex vitamins, tocopherols decrease by 15% and carotenoids by 58%. Cooking of millets further decrease vitamins up to 20%. Within analysed minerals Fe content was reduced up to 11%, Zn 16% and Ca 13%, cooking further reduced mineral content up to 5% when compared to the raw treated millets. Similarly, a decrease in antinutritional factors like phytic acid (up to 47%), tannin (up to 60%) and total polyphenol (up to 43%) within which free polyphenol (80%) and bound polyphenol (up to 55%) was also observed. Predicted mineral bioavailability as phytic acid mineral molar ratios observed to decrease with different treatments indicating an increase in mineral bioavailability viz., Fe, Zn and Ca up to 50%.

Conclusions: This comprehensive nutritional and antinutritional profile of hydrothermally processed minor millets viz., little, foxtail, browntop, barnyard and kodo millet will help to understanding how different processing methods effectively reduce antinutrients to varying extent thereby improving mineral bioavailability.

Keywords: millets, food composition, hydrothermal processing, phytate, anti-nutrients

(O6.5) *Determination of selenium in fish using ICP-QQQ-MS: analytical method and compliance considerations*

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Background and objectives: Selenium (Se) is an essential trace element that plays a crucial role in human health, yet comprehensive data on its content in foods remain scarce due to analytical challenges and potential interferences. This study aims to determine Se concentrations in fish using Inductively Coupled Plasma-Triple Quadrupole Mass Spectrometry (ICP-QQQ-MS), a highly sensitive and precise technique.

Methods: Ten varieties of fish, including both marine and freshwater species, were collected from three major wholesale markets in and around Bangkok. Samples were prepared in raw, boiled, and fried forms, and their edible portion (EP), moisture content, and Se concentrations were analysed. For Se quantification, 0.5 g of freeze-dried sample was digested with 5 mL Suprapure 65% HNO3 using an Anton Paar Multiwave digestion system. The digested solutions were diluted with deionized water, with Rh as an internal standard, before analysis by ICP-QQQ-MS. To mitigate spectral interferences, collision and reaction gas modes were employed, allowing the accurate detection of multiple Se isotopes, including 77Se, 78Se, 82Se, 78Se16O+, 80Se16O+, and 82Se16O+. Method validation was performed using Certified Reference Materials (CRMs), including SRM 1566b (oyster tissue) and NMIJ 7402-a (codfish tissue).

Results: The measured Se concentrations were 2.08 ± 0.13 mg/kg (certified value: 2.06 ± 0.15 mg/kg) for SRM1566b and 1.93 ± 0.07 mg/kg (certified value: 1.80 ± 0.20 mg/kg) for NMIJ7402-a. The precision, expressed as relative standard deviation (RSD), was 6.59% for SRM1566b and 4.00% for NMIJ7402-a, confirming the method's reliability in terms of both accuracy and precision. The limit of quantification (LOQ) was 3 µg/kg, with a recovery of 103.1% and a precision of 6.2% RSD, meeting acceptable validation criteria. Marine fish contained significantly higher Se concentrations (37.1–198.5 µg/100 g EP in fresh fish, 48.0–154.4 µg/100 g EP in boiled fish, and 52.9–262.4 µg/100 g EP in fried fish) than freshwater fish (6.9–29.4 µg/100 g EP in fresh fish, 10.1–26.5 µg/100 g EP in boiled fish, and 13.7–43.8 µg/100 g EP in fried fish). Longtail tuna exhibited the highest Se content among all species ($p < 0.05$). Based on Se levels, Longtail tuna, Short-bodied mackerel, Indo-Pacific Spanish mackerel, Nile tilapia, and Red Nile tilapia—particularly when boiled or fried—are recommended as excellent dietary sources of Se.

Conclusions: This study confirms the effectiveness of ICP-QQQ-MS as a robust method for Se determination in fish, demonstrating its suitability for food analysis, research studies (in vitro bioaccessibility and speciation of Se) and regulatory compliance. The method's accuracy, precision, and ability to overcome interferences make it an optimal choice for ensuring reliable Se quantification in food matrices.

Keywords: selenium, fish, ICP-QQQ-MS, bioaccessibility, speciation

SESSION 7. Application of food composition databases

(O7.1) *Creating survey specific nutrient conversion tables to produce statistics on apparent nutrient intake shared through the FAOSTAT Food and Diet domain*

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Background and objectives: The FAO Food and Diet domain, launched on FAOSTAT in 2024, shares statistics on apparent intake of energy and 16 nutrients from 57 household consumption and expenditure surveys (HCES) conducted in 34 countries. The quality of the statistics is highly dependent on the design of the survey's food consumption module, the level of detail of the food list, and on the quality of the food matching between the survey food items and foods in food composition tables/databases (FCTs). The processing of the 57 HCES has highlighted challenges and lessons learnt for food data collection, processing and analysis, that can inform national statistical offices, researchers, and FCT compilers/developers.

Methods: We standardized the creation of 57 HCES specific nutrient conversion tables (NCTs) with the nutrient profile for each food in the survey by (a) selecting high-quality FCTs based on their score after applying the screening questions from the FAO/INFOODS Evaluation Framework to assess the quality of published FCTs; (b) using FAO/INFOODS component identifiers (tagnames) for an unambiguous component description to ensure interchangeable nutrient values among FCTs; and (c) applying the criteria from the FAO/INFOODS Guidelines for food matching.

Results: An important challenge was the selection of a relevant FCT for each country. While 14 (41%) of the countries have a national FCT, one was not accessible and only three were classified as high-quality. Two high-quality regional FCTs were found relevant for 12 countries with no national FCT. The limitations of the FCTs included a lack of edible portions; relevant nutrients; full references at food or value level; components' full description or tagnames; and a user-friendly format. On average, nine FCTs were needed to match all the foods reported by households in a HCES. Overall, FCTs lack nutrient values for aquatic foods, exotic meats, insects, local or processed fruits/vegetables, and traditional foods. In general, HCES food descriptions lack information on non-edible parts (e.g. shelled/unshelled nuts); fortification; processing level (e.g. refined/whole grains); and animal sources such as milk products. We applied quality checks to evaluate the food matching, identify missing data and nutrient values outside expected ranges, and detect misclassification of foods in food groups.

Conclusions: Producing dietary-related statistics from HCES is a complex, yet feasible task. Improvements in HCES food consumption modules and high-quality national/regional FCTs are key elements for accurate assessment of apparent nutrient intake. Food statistics produced from HCES are useful to inform FCT compilers/developers on local food consumption and to identify potential new foods for analysis.

Keywords: food composition tables/databases, household consumption and expenditure surveys, food consumption, nutrient intake, food and diet domain

(O7.2) *Integrating digital receipts with food composition information: a data infrastructure validated for consumer and dietitian use cases*

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Background and objectives: From food diaries to nutrition apps, current dietary assessment typically relies on burdensome and error-prone self-reporting. Digital receipts from supermarket loyalty cards provide potential for accurate, long-term dietary assessment with minimal user effort, given a high loyalty card usage. To leverage this potential, branded food composition databases (BFCDs) tailored to enrich digital receipts are essential. We aim to develop and validate a data infrastructure leveraging enriched digital receipts to support applications enabling personalized nutrition analysis and recommendations.

Methods: We developed an integrated data infrastructure that automatically retrieves and enriches digital receipts with nutritional information, performs nutritional analyses, and generates dietary recommendations using a knowledge-based expert-designed algorithm. Besides providing food composition data, our customized BFCD identifies ambiguous item names (e.g., “B-Drink Past”), provides product sizes, categorizes products, and calculates the front-of-pack label Nutri-Score. Utilizing this infrastructure, we conducted two studies in Switzerland: (1) a consumer-focused two-arm randomized controlled trial evaluating the feasibility of automated dietary counseling, and (2) a usability study assessing a platform that analyses patient digital receipts for professionals (e.g., dietitians).

Results: In study (1), our system supported 61 participants and 15 test users for 9 weeks without system outages. Nine app users rated the system’s ease-of-use positively (4.4-5.0/7), with lower ratings for interface satisfaction (3.4-4.8/7) and usefulness (2.9-3.6/7). In study (2), 19 dietitians and 9 dietetics students gave positive System Usability Scale (SUS) scores (72.8±12.6 and 70.8±13.8 for the initial and follow-up session, on a scale of 0-100). Unified Theory of Acceptance and Use of Technology (UTAUT2) results indicated the platform was easy and enjoyable to use, with positive ratings (5.2-5.6, on a scale of 0-7) of the expectancy, hedonic motivation, and facilitation condition. Surprisingly, household size and food purchase data completeness had no significant effects on the SUS and UTAUT2 results.

Conclusions: We successfully developed and validated a data infrastructure for automated dietary assessment and recommendations. Key limitations include digital receipt availability and the challenges in creating and maintaining a high-quality BFCD. Incorporating alternative data sources (e.g., manual receipt scanning) and specialized databases (e.g., on food-related greenhouse gas emissions) could extend our infrastructure to support more applications with broader focuses, empowering individuals to make informed food choices.

Keywords: digital receipts, personalized nutrition, health informatics, information systems

(O7.3) *Addressing limitations in food composition data: EFSA's approach to intake assessments*

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Background and objectives: Following requests from the European Commission, the European Food Safety Authority (EFSA) was asked to deliver scientific opinions on the revision of the tolerable upper intake levels. In this context, a protocol describing the methodology to be followed was developed and four intake assessments (retinol, beta-carotene, vitamin D, manganese, and folate) were performed. We aim to discuss the main limitations of using EFSA's Food Composition Database and describe possible ways forward.

Methods: The EFSA Comprehensive Food Consumption Database was linked to food composition data using the FoodEx2 classification and description system. Nutrient concentration data in foods and beverages were primarily sourced from EFSA's Food Composition Database, which covers ~1,750 food entries from 14 EU compilers. Data-cleaning and gap-filling procedures were applied to ensure accuracy and completeness of the data. The observed individual means method was used to estimate the habitual dietary intakes of the European population. The mean, P5, Median and P95 of intakes were calculated for each survey by population group and sex.

Results: As part of this task, certain limitations and opportunities for improving EFSA's Food Composition Database were identified: a) it contains data up to 2012, potentially disregarding updated and newly introduced foods; b) food description, component identification and method of analysis or calculation often lack detail, increasing the difficulty to interpret and compare results; c) it is not possible to adjust the aggregated values to suit specific assessment needs since the underlying data and metadata documenting the basis for aggregation are not included.

Conclusions: Given the update of many national food composition databases in the EU since 2012 and the growing demand for high-quality, harmonized data, EFSA is currently working on a project to establish an Open Access European Food Composition Database. The aggregated food composition data from at least 16 EU, European Free Trade Association and Instrument for Pre- accession Assistance countries will be collected and expected to be publicly disseminated early 2026. On the long-run, EFSA aims to collect and publish analytical data at individual sample level to further address these challenges. Access to analytical data including their metadata, will enable better understanding of nutrient concentration variability and possible time trends due to changes in policy and/or environment. Increased level of detail will allow for more advanced intake and risk-benefit assessments, enable probabilistic approaches, and reduce uncertainties around assumptions that often accompany aggregated data, ultimately strengthening accuracy and transparency.

Keywords: EFSA, food composition database, analytical data, exposure assessment, nutrient intake

(O7.4) *Efficient implementation of changes to flour fortification in the UK for assessment of population nutrient intakes*

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Background and objectives: In October 2022, UK legislation mandated changes to the fortification of calcium (Ca), iron (Fe) and niacin (vitamin B3) in non-wholemeal wheat flours (NWFs), following the UK's exit from the EU. Minimum fortification levels for the three micronutrients were increased by approximately 15-18%. Our objective was to rapidly update the UK Nutrient Databank (NDB n=3286 foods) to reflect changes in NWFs and NWF-containing foods, to ensure provision of current and relevant nutrient composition data for population intake estimates of Ca, Fe, and B3 in the form of niacin equivalents (NE) in the UK National Diet and Nutrition Survey (NDNS).

Methods: Given the use of a generic food database in the NDNS, a pragmatic approach was required. It was agreed with UK government that relevant NWFs in the UK NDB would be updated to reflect fortification of each micronutrient at 15% of the respective adult Reference Nutrient Intake (RNI). Agreed fortification values per 100g of NWFs were: 120mg for Ca, 2.1mg for Fe and 2.4mg for B3. NWFs used in recipes were updated in a Recipes Database (RD), initially developed for risk assessment, with functionality further developed to allow auto-recalculation of respective nutrients in NDB foods containing NWFs. Proportional differences from pre- and post- updates were calculated and applied using R to manufactured foods in the NDB such as breads and biscuits. Homemade foods were automatically updated in the NDB by updating their ingredients. No updates were made to foods that were specifically fortified with these micronutrients, e.g. breakfast cereals.

Results: Our recipe approach streamlined the process, requiring minimal manual updates for only eight foods, e.g., white wheat flour, used as ingredients in the RD. This enabled automated updates to 370 manufactured foods and 243 homemade foods in the NDB. Values per 100g in the NDB reflected an average increase of 5.6mg in Ca, 0.05mg in Fe and 0.2mg in NE (B3). Data were thoroughly checked, with issues investigated and resolved. The main increase was observed in Ca, with less of an increase in Fe and B3, most likely due to the level of fortification. An assessment of the impact of the change in population nutrient intakes will be available for the conference (post 2019-2023 NDNS results publication).

Conclusions: Our approach using the structure of the NDNS NDB, a recipes approach for manufactured foods and deployment of a RD, readily facilitated the implementation of changes to flour fortification, although it still required comprehensive data processing and issue resolution. This approach will enable rapid implementation and evaluation of future updates, such as fortification of NWFs with folic acid, mandated in the UK from the end of 2026.

Keywords: food composition database updates, flour fortification, nutrient intakes

SESSION 8. Food composition data for agrifood systems transformation

(KEYNOTE.3) *From food composition to food system transformation: lessons from Indigenous Peoples' food systems of Northeast India*

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The Indigenous Peoples' food systems of Northeast India represent some of the most biodiverse, ecologically sound, and nutritionally rich systems in the world. The approach is based on traditional ecological knowledge and low external input methods. It incorporates a wide array of cultivated, foraged, and underutilized foods, including nutrient-dense insects, into culturally grounded dietary patterns. The region, with more than 240 indigenous tribes, holds a vast, living repository of food biodiversity, most of which remains unknown in global nutrition discourse.

Compositional analysis of key indigenous foods revealed remarkable nutrient density, some with even therapeutic potential, suggesting the significant role that these underutilized foods could play in enhancing sustainable diets globally. Despite their remote geographic isolation and limited infrastructure, indigenous-majority states in Northeast India have consistently outperformed national averages in health and nutrition indices across all five rounds of the National Family Health Surveys (1992–2020). The positive health and nutrition outcomes of the Indigenous people of Northeast India are closely linked to diverse, minimally processed diets and integrated food systems that supply their nutrient needs. These outcomes demonstrate the potential of Indigenous peoples' food systems as scalable models for sustainable, health-promoting diets worldwide.

However, these systems face mounting pressure from globalization through dietary shifts to ultra-processed foods and the erosion of traditional knowledge, particularly among the youth, contributing to health crises, such as non-communicable diseases. The lecture highlights why Indigenous Peoples' Food Systems should be recognized not as relics of the past but as living functional models for addressing global challenges in food and nutrition, biodiversity loss and climate resilience. Preserving Indigenous Peoples' Food Systems and integrating them into national and global policy frameworks is essential for Indigenous food sovereignty and building truly sustainable, health-promoting, climate-resilient food systems worldwide.

Keywords: Indigenous Peoples' food systems, biodiversity, nutrient density, traditional knowledge, sustainability.

(O8.1) *Fishery nutrient profiles: practical tools for nutrition-sensitive fisheries management in LMICs*

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Background and objectives: Small-scale fisheries (SSF) are a crucial source of nutrient-dense aquatic foods in low- and middle-income countries (LMICs), yet practical tools to manage these fisheries for optimal nutritional outcomes remain limited. We aimed to develop an analytical framework and predictive model to assess how fishing gear, habitats, seasons, and vessel types influence the nutritional quality of fisheries catches, thus supporting nutrition-sensitive fisheries management (NSFM).

Methods: We analysed six years (2018-2023) of detailed fisheries data from Timor-Leste, covering multiple species, habitats, and fishing methods. Nutrient density scores (NDS) for calcium, iron, omega-3 fatty acids, protein, vitamin A, and zinc were calculated for each catch. K-means clustering defined three distinct Fishery Nutrient Profiles (FNPs). We then developed predictive XGBoost machine learning models to evaluate the impact of fishing methods and habitats on these nutritional profiles.

Results: Fishing gear and habitat were significant predictors of catching nutritional profiles. Small pelagic fishes (e.g., mackerels, sardines) provided the highest nutrient yields, particularly calcium, iron, and omega-3 fatty acids. Marine invertebrates, such as crabs and octopuses, also showed high nutrient densities. Our models demonstrated high predictive accuracy (AUC >0.90), illustrating how combinations of fishing methods (e.g., gill nets, seine nets) and habitat use (e.g., reefs, pelagic zones, FADs) can be strategically managed to enhance nutrient availability.

Conclusions: Our replicable framework offers practical tools to guide fisheries management toward nutrition-sensitive outcomes. This approach can inform policy decisions aimed at enhancing nutrition security and ecosystem health in LMIC fisheries, facilitating integrated policies that support both public health and ecological sustainability goals.

Keywords: small-scale fisheries; nutrition-sensitive; multispecies fisheries management; malnutrition; micronutrients

(O8.2) *Contributions to requirements and cost-per-nutrient of processed fish products (PFPs) and other animal-source foods (ASFs) for women of reproductive age and children 6- 23 months in Delta State, Nigeria*

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Background and objectives: The overall diet of women and children is likely to be deficient in essential nutrients due to the low contribution of ASFs to nutrient intakes (1). ASFs are capable of meeting the protein and micronutrient needs of vulnerable groups; however, their use is limited by cost. We evaluated the contributions and cost-per-nutrient of PFPs and other ASFs in relation to the requirements of women and children to serve as a guide for informed food selection for dietary interventions.

Methods: A one-year quarterly market survey was conducted in randomly selected markets in the study area to determine the cost of PFPs and other ASFs. PFP samples were collected, prepared in forms consumed and analysed for their proximate, mineral and vitamin contents using standard methods. The composition of other ASFs were obtained from available FCTs (2, 3). The contributions to requirements and cost-per-nutrient in the samples relative to the nutrient requirements (4) for women and children were calculated and compared. Data were analysed using descriptive statistics.

Results: Using assumed portion sizes of 25g/day and 50g/day for children and women (5), respectively, small indigenous fish species (SIFS): brown and white Clupeids (*Clupea harengus*), crayfish (*Procambarus clarkii*) and "bonga" (*Ethmalosa fimbriata*) contributed ≥ 50% to protein, calcium, iodine and folate requirements. Brown clupeid contributed more to iron (71-83%) and zinc (23-58%) compared to beef liver and other ASFs. The cost of meeting protein needs from SIFS (₦82- ₦111 for children; ₦391- ₦687 for women)) was comparable to that of egg (₦95 for children; ₦451- ₦589; Exchange rate as at May 2023 was ₦461 to 1USD). The cost of iron in whole brown clupeid (₦181, for children and ₦ 312 for women) was slightly lowest but comparable to beef liver (₦191 for children and ₦343 for women). For children, the cost of zinc from whole brown clupeid (₦337) compared favourably with other commonly consumed animal protein sources (₦253-₦350 for lean beef, liver, kidney, egg and milk). In the case of women, lean beef was the most affordable source of zinc, followed by whole brown clupeid and egg. The SIFS were the cheapest sources of calcium for women and children (₦50 - ₦109 for children; ₦108- ₦240 for women) and cheaper than powdered milk (₦164 - ₦360). Generally, fish were the cheapest sources of iodine and folate.

Conclusions: The findings of this study show that fish are cost-effective sources of essential nutrients. The potentials of the SIFS particularly the white and brown clupeids need to be further investigated and exploited for planning sustainable diets and improving nutritional outcomes in women and children.

Keywords: cost-per-nutrient, women and children, processed fish products, animal- sourced foods, contributions to requirements

(O8.3) *Integrating food composition and environmental impact data: identifying and ranking sustainable food choices for risk-benefit assessment*

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Background and objectives: In recent years, growing concerns about public health and environmental sustainability in line with the One Health approach have emphasized the need for more informed food choices. While nutritional databases provide valuable insights into the composition of foods, they often lack integration with environmental impact data, which is one of the key aspects in assessing overall food sustainability. This study suggests a new strategy to integrate Nutri-Score, a widely used nutritional quality index, with Eco-score, an environmental impact assessment derived from Agribalyse, the French agricultural and food Life Cycle Inventory (LCI) database. Ranking foods based on these combined scores enables the identification of options that are both nutritionally beneficial and environmentally sustainable, providing a foundation for further risk-benefit assessments (RBA) to evaluate their impact on human health.

Methods: Nutri-Score was calculated to assess the nutritional quality of food items from the Ciqual food composition database, while Eco-score provided corresponding environmental impact data. Integration was facilitated by the public availability of both databases and their shared food item entries, ensuring consistency in data mapping. Foods were ranked using multicriteria decision analysis (MCDA) tool based on assigned food groups, subgroups, and sub-subgroups from Ciqual database. Product of normalized Nutri-Score and Eco-score values generated a composite Nutri-Eco ranking index. Food items missing one of the scores were excluded.

Results: A total of over 1,900 food items from the Ciqual database were evaluated based on the composite Nutri-Eco ranking index (ranging from 0 to 100, with 100 being the highest possible score). Food items with both high Eco-scores and Nutri-Scores consequently achieve the highest Nutri-Eco ranking index. The top-ranked food sub-subcategories included legumes and vegetables (both raw and cooked), while the lowest-ranked included dry sausages, lamb and mutton meat, as well as various chocolate and biscuit products.

Conclusions: The integration of multiple scoring systems into a unified ranking tool enhances the usability of food composition databases, making them more relevant for developing public health strategies. Furthermore, this approach allows the definition of appropriate substitution scenarios in RBA and supports sustainable dietary transitions.

Keywords: dietary shift, sustainable diet, nutrients, sustainability metrics, public health impact

SESSION 9. National and international activities

(O9.1) *Exploring research electronic data capture [REDCap] capabilities for managing services and products of SAFOODS*

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Background and objectives: The South African Food Data System (SAFOODS) website features the promotion of food composition and encourages responsible use of nutrient composition data. Services offered via the website include procurement of products, requests for statistical support, and general enquiries. Migration to a research electronic data capture (REDCap) system has streamlined processes. REDCap, a secure, web-based system, offers the platform for data collection, management, and analysis. The study aims to explore the capabilities of REDCap to collect client data for tools and services procured via website platform.

Methods: The REDCap system was integrated into the SAFOODS website. This integration allowed for the collection of real-time purchase data, including product preferences, frequency of purchases, and demographic details. The system was designed to capture data efficiently and accurately, ensuring that all client interactions with the website were recorded. The system facilitated real-time tracking of client eBook preferences and statistical support requests, reducing manual data entry efforts and streamlining service requests and client database management.

Results: REDCap facilitated structured and efficient online data collection, significantly improving accuracy. The system enabled real-time tracking of client eBook preferences and statistical support requests. Secure storage and controlled access ensured data privacy compliance. The integration reduced manual data entry efforts, streamlining service requests, and client database management. To maintain data integrity, the collected data was used for trend assessment and monthly reporting.

Conclusions: A robust and quality-controlled system successfully rolled out via SAFOODS online web platform has enhanced data collection of all SAFOODS client requests.

Keywords: website, redcap, statistics

(O9.2) *Challenges and achievements in capacity development and harmonization of food consumption data collection in EFSA EU Menu national dietary surveys in Balkan region for dietary monitoring, sustainable healthy diets and food systems transformation*

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Background and objectives: Harmonized and standardized collection, processing, and analysis of individual dietary data are fundamental for accurate nutrition assessment, evidence-based policymaking, and the development of sustainable food systems. Recognizing the need for consistency across European dietary surveys, the European Food Safety Authority (EFSA) launched the EU Menu program offering methodology to support harmonized food consumption data collection. This initiative aimed to establish a Comprehensive European food consumption database, facilitating risk assessment and public health strategies. To achieve this, EFSA funded 36 dietary surveys covering children and adults across 18 EU Member States and four Balkan pre-accession countries, ensuring alignment with standardized protocols. The program implementation in the Balkan region required addressing challenges such as lack of harmonized and validated research infrastructure (RI) while bringing the opportunities for capacity development in food consumption and composition data collection, all of which are crucial for informing transformation of food system toward sustainable healthy diets.

Methods: CENM-IMR and CAPNUTRA network focused on strengthening research capacity and developing a standardized RI that aligns with the EFSA EU Menu methodology principles -the Diet Assess and Plan (DAP), an innovative tool for standardized dietary intake assessment, which was implemented in four Balkan countries. DAP application serves as a unique example of an advanced technology for standardized and harmonized dietary intake assessment, enabling the collection of high-quality food consumption data and presents cutting-edge solution for large-scale nutritional epidemiological studies.

Results: National dietary surveys were conducted between 2017 and 2023, including adults aged 10 to 74 years in Bosnia and Herzegovina, Montenegro, and Serbia, and children aged three months to nine years in Montenegro, North Macedonia, and Serbia. The collected food consumption data adhere to the EU Menu methodology while the Balkan Food Composition Database was updated and expanded to better reflect actual food consumption patterns across the region, enhancing the accuracy and relevance of dietary assessments.

Conclusions: The collected data serve as a foundation for dietary and exposure risk assessments, the establishment of national nutrient reference values, and development of food system-based dietary guidelines. Furthermore, these resources provide essential evidence and infrastructure to support defining public health nutrition policies and inform strategic pathways for transforming the Balkan food system into a more nutrition-sensitive and sustainable model.

Keywords: capacity development; food consumption data collection harmonization; national dietary surveys; food systems; Balkan region

(O9.3) *LATINFOODS initiatives to enhance food composition data in Latin America (2022–2024)*

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Background and objectives: During 2022/24, LATINFOODS implemented strategic initiatives to improve the quality, accessibility, and management of food composition data in Latin America. Key activities included the formation of committees, capacity-building workshops, and the development of standardized tools for data compilation and dissemination. A central objective was establishing and maintaining the LATINFOODS Food Composition Database Portal, a regional food composition data collaborative platform.

Methods: A new logo was adopted to represent the Network. Collaborative projects and training activities were organized—online and in person—covering food composition data compilation, food description, and recipe calculations. The manual and compilation forms were updated in alignment with international standards and disseminated. Monthly meetings with the Coordinators and Presidents of all chapters were conducted and continue to be held. Periodic meetings, symposia, and institutional partnerships facilitated knowledge sharing and methodological standardization. Additional efforts focused on food sampling workshops, data aggregation, native food data collection, and sodium reduction campaigns to support regional public health policies.

Results: Highlighted goals achieved by LATINFOODS during this period included the updating designation of a Management Group and Committees, and updating the website. LATINFOODS conducted regular presentations and activities at monthly meetings and organized training courses and workshops. The last benefitted over 50 professionals in food data compilation and recipe calculation, strengthening regional expertise. The network actively participated in conferences, congresses, and symposia, ensuring continuous dissemination through publications and presentations. A standardized compilation manual and forms were developed harmonized and disseminated across all LATINFOODS chapters. The LATINFOODS Food Composition Database Portal (https://latinfoodsportal.net/) was successfully launched. In the first pilot phase, it was possible to compile approximately 600 foods, ingredients, and regional preparations. Currently, around 400 foods are available, and the remaining 200 are under review, with ongoing efforts to enhance data collection, expand participation, and incorporate more countries and data across the LATINFOODS network.

Conclusions: The LATINFOODS Food Composition Database Portal promotes regional information exchange and enhances the credibility and dissemination of food composition data. This period reflects a significant commitment to advancing research and ensuring high-quality data on food composition across Latin America.

Keywords: portal, food composition data, LATINFOODS, regional collaboration

(O9.4) *Approach and resources for the sustainable update of the Portuguese Food Composition Database: a multi-source and collaborative strategy*

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Background and objectives: The National Institute of Health Doutor Ricardo Jorge (INSA) compiles the Portuguese Food Composition Database (FCDB). Since the first edition in 1961, formats, components, data sources, and management have evolved. Participation in the EuroFIR Network (2005–2010) helped INSA establish strategies, collaborative networks, and infrastructures to ensure regular updates and long-term sustainability. The 2023 version (6.0) includes 44 components for 1330 generic foods, with a new release planned for early 2025. This study presents the strategy and resources for updating the FCDB, integrating analytical and other data sources, while highlighting the role of stakeholders and digital tools in the process.

Methods: To ensure data accuracy, INSA conducts an annual analytical program, analysing 12–22 food pool samples in its accredited laboratories. This program prioritizes key foods and components, under the Analytical Updating Commission (AUC). For the 2025 update, Total Diet Study (TDS) nutrient samples were evaluated for adequacy to generic food profiles. Additional analytical data from the industry and distribution sectors were collected via PortFIR's working group (GTTCA), while addressing user needs. Additionally, European food composition resources (e.g., FoodExplorer-EuroFIR) and food labelling data were used to enhance data completeness. FoodCASE® ensures compliance with EuroFIR's technical requirements, with automated checks detecting inconsistencies, which are then manually reviewed and corrected.

Results: The 2025 FCDB update includes new foods and components, along with nutrient revisions (mainly salt and sugar) linked to the national reformulation strategy. The annual analytical program, based on AUC prioritization, provides high-quality nutrient data, improving dietary representativeness. Regarding TDS-based analytical data, 164 TDS samples were analysed, with nearly 58% integrated into the FCDB, based on composition suitability. The GTTCA, which meets bimonthly, includes 74 members, representing data users and producers, playing a key role in revising the FCDB, ensuring national data access, and addressing user needs. The PortFIR® website remains a key dissemination platform, providing free access to the FCDB, along with tools for food comparisons, recipe calculations, and dataset downloads.

Conclusions: A multi-source, collaborative approach is key to ensuring sustainable FCDB updates. However, financial constraints remain a major challenge, as the Ministry of Health lacks dedicated funding for analytical programs. Additional resources and institutional support are essential to guarantee the long-term sustainability of the FCDB, supporting nutrition research, public health, and the food industry.

Keywords: food composition table; nutrients; analytical data; consumer health information; food data harmonization

(O9.5) *Global harmonisation of dietary intake and food composition data with FoodEx2*

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Background and objectives: A major challenge in analysing dietary data and performing nutrient intake assessments relates to the differences in the description of food items in different datasets. The use of a common food classification and description system among dietary surveys and food composition tables and databases (FCTs) facilitates food matching and contributes to the global harmonisation of dietary surveys and food composition data. FoodEx2 is a food classification and description system developed and maintained by the European Food Safety Authority (EFSA). It is regularly updated and expanded to consider use at global level, with the support of the Food and Agriculture Organization (FAO) of the United Nations and subsequently used to harmonise FCTs and dietary surveys shared through the FAO/WHO Global Individual Food Consumption Data Tool (FAO/WHO GIFT). The objective of this study is to demonstrate the extent of the global harmonisation of dietary surveys and FCTs using FoodEx2, highlighting its potential in facilitating food matching and nutrient intake assessments.

Methods: Information was gathered on the number of dietary surveys and FCTs that have been harmonised with the FoodEx2 system with support from FAO and EFSA. The number of data managers and institutions trained by FAO on FoodEx2 to harmonise dietary surveys and FCTs was also assessed. Public databases were used to facilitate the search, namely the FAO/International Network of Food Data Systems (INFOODS) FCT repository and FAO/WHO GIFT, as well as information from FAO, EFSA and INFOODS activities.

Results: Seventeen FCTs (4 global, 2 regional-specific and 12 country-specific FCTs) and 162 dietary surveys from 64 countries have been coded with FoodEx2 with support from FAO and EFSA. Out of those, 62 dietary surveys are currently disseminated through FAO/WHO GIFT, and 14 are in preparation. FoodEx2 codes for 2 FCTs are already publicly available in the FAO/INFOODS repository, whereas the dissemination of codes for the remaining FCTs is in preparation. In addition, over 140 data managers from more than 35 institutions have been trained on the use of FoodEx2 by FAO since 2018.

Conclusions: FoodEx2 has been increasingly used to harmonise dietary surveys and FCTs globally, enhancing the consistency and interoperability of datasets. A considerable number of FCTs and dietary surveys have already been harmonised, and a significant number of data managers from institutions worldwide trained on FoodEx2, developing capacities and enabling future harmonisation efforts. In addition, the sharing of FCTs in spreadsheet format facilitates harmonisation with FoodEx2 and leverages data use. This expansion and harmonisation effort will facilitate food matching and data use at a global level.

Keywords: data harmonisation, dietary assessment, food classification, food composition, individual food consumption, data sharing

SESSION 10. New databases and approaches

(O10.1) *Development of the new Australian Branded Food Database*

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Background and objectives: Food Standards Australia New Zealand (FSANZ) was asked to expand its food composition data holdings and develop a database of Australian branded foods. The database will be used as a comprehensive, central and trusted, source of information, to support standards development work and broader public health policies, and initiatives in Australia. To describe the development of FSANZs new Australian Branded Food Database (BFD), and to identify future development and data integration and publication plans.

Methods: The development of an Australian BFD involved (1) developing tools for data collection, transfer and auditing; (2) developing a data management system for the storage, analysis, and reporting of branded food data; and (3) developing an open access platform for accessing the branded food data. FSANZ worked closely with the food industry and several external contractors in the development of these tools and databases.

Results: The BFD provides a secure and integrated data collection, management and reporting system to support FSANZ current and future needs. Regular updates and audits will ensure its accuracy and currency is maintained. While its efficient data interrogation and reporting features will enable easy monitoring of the food supply and product reformulation over time.

Conclusions: The BFD represents a significant advancement in food composition data management in Australia that can be used to support FSANZ development work and supports public health policies and initiatives. Future integration with additional datasets could further enhance insights into food consumption patterns, strengthening evidence-based nutrition and regulatory decision-making.

Keywords: Australia, branded food database, food composition database, packaged foods, food labelling

(O10.2) *Developing the Greek branded food composition database (HelTH): update and expansion methodology*

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Background and objectives: Branded Food Composition Databases (BFCDs) are valuable tools to study the modern foodscape. In Greece, the first BFCD, Hellenic Food Thesaurus (HelTH), was developed in 2021 and included data for ~5,000 packaged foods through data collection from online supermarkets. The dynamic nature of the food market requires from BFCDs a constant update and expansion to match changes in the foodscape and, taking advantage of new tools, to meet high quality criteria.

Methods: The first update of HelTH was carried out through field research in two phases from July 2023 to September 2024. The 'Composition and Labelling Information System (CLAS) software was used to assist data collection and curation. From July to October 2023 (Phase 1), researchers indexed all branded foods available in four mega supermarkets in Attica from a major retailer. In phase 2, July to September 2024, food supplement data were collected from 16 pharmacies in Attica. Foods are categorized using LanguaL Thesaurus to maintain consistency with HelTH's previous version and are described with EFSA's FoodEx2 system to align with international standards for food composition databases. Nutritional composition, ingredient lists, and qualitative information (claims, symbols, allergens, additives) were extracted for all products as shown on pack.

Results: The updated version of HelTH includes data on 10.941 products, consisting of 8.952 packaged foods and 1.989 food supplements sold in the Greek market - 44% more products than the previous version. To the existing HelTH's food categories were added new food groups including dietary supplements, baby foods, packaged fresh fruits and vegetables, coffee and tea, water, chewing gums, oils, vinegars, spices, and additives. A small proportion of foods (<25%) were discontinued between the two versions, while preliminary analysis does not provide evidence of extensive product reformulation. Tailored data collection strategies beyond the major supermarket chains are still required for the mapping of organic, traditional and special diet foods.

Conclusions: Regular data collection is a key element in the update and expansion of BFCDs. The systematic update of HelTH using a dedicated software increased the ease of data collection and curation, allowing for higher volume data and accuracy. In this newer version, HelTH further improves its value and impact as a comprehensive tool for the international research community, clinical and dietetic practice, the food industry and consumer.

Keywords: branded food composition databases, food labels, packaged food, Greece

(O10.3) *Decoding food labels: a scalable framework for ingredient identification and classification*

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Background and objectives: Food labels provide critical insights into product composition, safety, and regulation compliance. However, the systematic extraction and classification of ingredient data remain challenging due to label formats and multilingual packaging variations. To address this, we initiated a study funded by the Belgian Federal Public Service Public Health aimed at enhancing our understanding of food product ingredients. As part of our study, we developed a decision-tree-based framework for automated ingredient identification, classification, and food categorization, ensuring structured, scalable, and high-frequency data collection. The system supports food safety monitoring and exposure assessments, may allow market trend analysis, and supports nutrition policy.

Methods: A multi-step framework was developed using web scraping, natural language processing (NLP), and machine learning (ML) techniques. The decision tree guides the processing pipeline: (1) Data Collection—scraping food label text from retail websites and databases; (2) Text Preprocessing—handling synonyms, duplicates, and missing information. (3) Multilingual Processing—using ML for translation; (4) Ingredient Extraction—identifying and normalizing ingredient names using regulatory lists and food ontology databases; (5) Classification—assigning ingredients to predefined categories (e.g., additives, allergens, processing aids) and mapping foods to EFSA-FOODEX and legislative classifications; (6) Analysis & Validation—quantifying ingredient frequency, evaluating percentage compositions, and ensuring regulatory compliance; (6) Data Integration—structuring outputs into a continuously updated database for risk assessment and policy use.

Results: Preliminary testing demonstrates that the framework can be applied to extract and classify food and ingredients across diverse product categories accurately. NLP-based classification enhances ingredient recognition, while hierarchical food categorization ensures alignment with official taxonomies. Initial findings highlight trends in additive use, demonstrating the system's potential for ongoing monitoring.

Conclusions: This scalable framework enables systematic ingredient identification and classification, supporting regulatory compliance, risk assessment, and sustainability evaluations. Integrating automated data acquisition with decision-tree logic ensures frequent updates and long-term applicability for food safety monitoring. Future work will focus on refining ingredient percentage estimations, expanding multi-language capabilities for broader EU implementation, and integrating OCR correction for scanned labels to enhance data acquisition from non-digital sources.

Keywords: food label analysis, natural language processing (NLP), food classification

(O10.4) *Development of nutritional composition data for commonly consumed foods (generic foods) via statistical analysis and thematic reconfiguration of branded food composition data*

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Background and objectives: Access to updated nutritional composition data for commonly consumed foods is often hindered by the resource intensive nature of chemical analyses and sampling, especially in countries with resource scarcity. Artificial intelligence is proposed as an alternative if based on accurate statistical methods. The capacity to derive homogeneous and trustworthy nutritional composition data from the statistical and thematic reconfiguration of branded food data was investigated.

Methods: A total of n=4851branded foods sold in Greek supermarkets were grouped in a FoodEx2 inspired food thematic network to create n=343 generic foods. A secondary database of branded food composition data derived through chemical analysis in an independent laboratory was used to benchmark the statistically derived generic values.

Results: Descriptive statistics showed large variation (Coefficient variation >15%) in saturated fat and total sugar content in chocolate milks, desserts, and ready meals. Similarly, large variation in salt content was seen in cereal products, ready meals and baked goods. On the contrary, the creation of generic foods in pasta, bread, rusks, unflavoured dairy, juices and fruit/vegetable-based foods was statistically linked with lower variation and deemed more homogeneous. Statistically derived generic food composition data showed good agreement with the data derived from traditional chemical analysis.

Conclusions: Branded food data could derive trustworthy information for the composition of generic foods in key labelled nutrients.

Keywords: generic foods, branded food data, food composition databases, thematic analysis, statistical reconfiguration

(O10.5) *Development of a recipe calculation tool for Filipino mixed dishes and other prepared foods*

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Background and objectives: Direct laboratory analysis is expensive and impractical since a single Filipino dish can have multiple ingredient combinations, varying cooking methods, and may change over time. Thus, recipe calculation is generally preferred in estimating energy and nutrient content. This study aimed to develop a recipe calculation tool for Filipino mixed dishes and other prepared foods, streamlining nutrient estimation while maintaining accuracy.

Methods: The tool is developed in accordance with FAO/INFOODS guidelines, employing the mixed method of recipe calculation. The 2019 Philippine Food Composition Tables (PhilFCT) database was integrated into the tool as a source of nutrient data of ingredients. Any loss or uptake of both macro and micronutrients in various cooking procedures was accounted for in this tool, utilizing nutrient retention factors from various sources, primarily Bognár (2002). Developed using Google Sheets, the tool allows manual input of total cooked weight or yield factors based on the recipe or literature. It also allows for easy recipe input, portion size adjustments, and a clear display of nutrient output. A total of twenty mixed dishes and prepared foods, based on FNRI-developed recipes, including meat, poultry, egg, cereals, fruit, and vegetable- based dishes such as pork wonton, fried rice mix, hotcake, scrambled egg, fruit salad, and various boiled vegetables, among others, underwent laboratory analysis of 20 nutrients using validated AOAC methods. The laboratory results were compared with the calculated values using a two-tailed paired t-test to ensure the accuracy of the tool.

Results: Results revealed that there were no significant differences between calculated and measured values for all nutrients and foods (all t-statistics < critical t-value, $p > 0.05$). For instance, the calculated water, protein, fat, and ash content of a fried rice mix (*Yaconrice medley*) were 70.49 g, 2.50 g, 4.56 g, and 1.13g, compared to the analysed values of 69.10 g, 3.00 g, 4.00 g, and 0.80 g, respectively.

Conclusions: This newly developed recipe calculation tool has the potential to provide more relevant and accurate food composition estimates for Filipino mixed dishes, which is useful for better meal nutrition evaluation, dietary assessments, and making informed health decisions. Further development will focus on enhancing the user experience and expanding the database.

Keywords: recipe calculation, food composition data, Philippino foods, mixed dishes, prepared foods

14TH INTERNATIONAL FOOD DATA CONFERENCE

Food composition databases: application for healthy diets and sustainable agrifood systems transformation

Poster presentations

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(P1.7) *Saudi Food Composition Database: food identification and food matching*

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Background and objectives: Food Composition Databases (FCDs) are valuable resources that provide essential information on the nutritional content of foods. Globally, there is limited clarity on which nutritional components and FCDs are included in highly cited papers, which are critical for assessing and analysing food consumption patterns. National FCDs play a key role in public health nutrition by promoting and maintaining population health through informed citizen choices and coordinated societal efforts. However, several countries (including Saudi Arabia) lack their own datasets, so they often use the FCT provided by the Food and Agriculture Organization. Despite that, the gaps and needs in FCDs arise due to rapidly evolving food markets and emerging nutritional and health interests. This study aims to highlight the essential steps required to create a national Saudi Food Composition Database (SFCD).

Methods: The study used a comprehensive approach to developing the Saudi Food Composition Database. It first addressed food identification challenges by creating a new analytical tool designed to accurately match similar foods. Additionally, a novel scoring system was introduced to enhance data accuracy and assess the quality of nutritional information.

Results: The analytical tool streamlined the identification and matching of similar food items within the database. The newly developed scoring system significantly improved data precision, providing a robust framework for evaluating nutritional quality. Furthermore, a new classification —comprising Food Group, Sub-group, and Sub-sub-group — was developed specifically for the SFCD, improving the organization and accessibility of the data for researchers and policymakers.

Conclusions: Developing innovative methods for managing national food composition data is crucial. The analytical tools, scoring systems, and classification structures introduced in this study are vital resources that will support future research in food data analysis, contributing to the ongoing development of comprehensive and reliable national FCDs.

Keywords: food composition, FAO/INFOODS, food matching, food identification, analytical method

(P1.8) *Food composition data for food systems transformation*

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The food composition database provides information on the amount of vitamins and minerals contained in different foods. It is also an important resource for understanding the nutritional quality of foods and their impact on health and sustainability. These databases, traditionally used for dietary assessment and nutrition policy, are now gaining recognition as important tools for transforming food systems in response to global challenges such as climate change, food insecurity and diet-related diseases. By integrating data on nutrients, bioactive compounds, environmental influences and food processing impacts, FCDBs provide a basis for evidence-based decision making that balances health and sustainability goals.

The application of FCDBs extends beyond academia and policy to practical areas such as sustainable dietary guidelines, environmental labelling, food reformulation and consumer awareness. Particularly important is their role in promoting biodiversity, reducing food waste and supporting regionally adapted sustainable diets. However, challenges such as data standardisation, regional disparities and the integration of new sustainability metrics need to be addressed to maximise their impact.

This paper explores the evolving role of FCDBs in supporting the transition to sustainable and healthy diets. It highlights key case studies that demonstrate their application in national and global food policy, sustainable agriculture and digital nutrition tools. It concludes by discussing how the scope, interoperability and accessibility of databases can be improved to accelerate the transformation of food systems.

Keywords: hunger, environmental nutrition, sustainable food systems, well-being

(P1.9) *Processing of fish products in Zambia for sustainable food systems and nutritious food for the first 1000 days in life*

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Background and objectives: Fish is a highly perishable food, and in the absence of cold chain technologies, is often preserved using traditional technologies in rural fishing communities of Zambia. High fish losses contribute to food insecurity, malnutrition, and unsustainable food systems in Zambia. The purpose of this study was to explore the nutrient profiles of indigenous fish species and fish products processed using traditional technologies as well as technologies designed to improve food quality, reduce fish loss and waste, and increase efficiency, to contribute to more environmentally and economically sustainable fish supply chains.

Methods: We analysed the proximate, vitamin, mineral and fatty acid composition of ten fish products from inland capture fisheries. Samples of ten fish products from inland capture fisheries in Zambia were collected and analysed for their nutrient content. The potential contribution of each species to recommended nutrient intakes (RNIs) for pregnant and lactating women (PLW) and infants was calculated.

Results: Iron content of fish products ranged from 0.31 to 2.49 mg/100 g, zinc from 0.2 to 1.13 mg/100 g, and calcium from 151.15 to 636.28 mg/100 g. Docosahexaenoic acid (DHA) was highest in smoked fish and smoked fish powder processed using improved smoking kilns, which contributed >35% of daily DHA requirements for pregnant and lactating women (PLW) and infants, while all ten products contributed ≥10% of daily requirements of DHA for both PLW and infants. Improved techniques for smoking fish resulted in greater content of Vitamins A and E, compared to traditional methods.

Conclusions: The article provides evidence of the nutrient content of various fish products processed using traditional and improved technologies which are important for sustaining fish consumption and contributing to food security and nutrition in Zambia in the first 1,000 days of life.

Keywords: fish, processing, Zambia, IYCF, fish powder

(P1.11) *Changing the food systems in Africa*

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The potential of neglected and underutilized crop species (NUS) to address hunger, malnourishment, and the effects of climate change is becoming increasingly apparent. These hardy plants, which are sometimes called small or underutilised, present important chances to enhance food diversity and agricultural sustainability. However, obstacles including low knowledge, market accessibility, seed availability, and research funding prevent their development. What is needed is an enabling environment in terms of policy to promote and develop these crops, which is now lacking. After reviewing research and laws pertaining to wild food plants, nutrition, and justice, we discovered that there are numerous underutilised, resilient, and nutritious crop species that might be cultivated to eradicate hunger in Africa. These featured African green vegetables like amaranth and wild mustard, as well as bambara groundnut, cowpea, pigeon pea, millet, and sorghum. Our research identifies nutrient-dense crops that smallholders might plant on their property and that are resistant to heat and drought. Something is inappropriate for broad monoculture. That being said, policy reforms are required for this to occur. Through incentives, supply of different inputs and governments should promote their production and use. Campaigns are required to dispel the myth that only the poor consume these crops and to raise public knowledge of the benefits these crops provide for the environment and health.

Keywords: policy, African, food systems, government, food

(P1.12) *Nutritional value of imitation meat vs meat of animal origin*

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Background and objectives: The world is constantly changing. Importantly, consumer awareness is also changing, resulting in a shift in dietary choices and the introduction of new products lines. These changes in consumption patterns along with increased health and planetary awareness stimulated the demand for the innovation of plant protein-based meat in many countries.

Methods: Five of the most readily available burger patties with varying main ingredients were sourced using the INFOODS sampling guidelines (A – Beef; B – Soya & beef mix; C – Pea protein; D – Soya; E – Mushroom). Samples were sourced in quadruple and homogenised into two composite samples for analyses in duplicate. Burger patties were the product of choice as it is one of the most readily available imitated products. Nutritional analyses was done on the samples along with amino acids, nutrient density and fatty acid profiles as well as a cost analysis.

Results: Energy content of the products varied between 454 – 1047 kJ/100g. Sodium, a nutrient of concern, is strictly governed in processed meat products but not in imitation meat products in SA. The 100% beef product had the lowest analysed sodium value (240 mg/100g). A discrepancy was seen in the sodium values as stated on the packaging versus the analysed value of the imitation meat products with variances as high as 56% between values. Protein quality was measured and PDCAAS values, ranged from 0.93 for the pure beef product to 0.44 for the mushroom based patty. The validity of label claims was explored, revealing a prevalence of claims on imitation meat products compared to the meat-containing counterparts.

Conclusions: There were significant differences in the nutritional value of burger patties with varying main ingredients. This study highlights the need for updated legislation that governs new food products that are promoted to consumers.

Keywords: imitation meat, plant-based alternatives, nutritional value, nutri-economics

(P1.13) *Establishment of a nutrient profiling model for nutritional evaluation of restaurant dishes in China*

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In order to meet the growing demand of Chinese residents to eat out and reduce the health risks associated with eating out, it is important to establish an applicable nutrient metric model to druadge nutritional value based on the energy and major nutrients distribution in Chinese restaurants dishes.1224 dishes were sampled from 21 provinces and categorized according to the proportion of main ingredients and cooking way. After food composition analysis, the content distribution of energy proteins, fats, carbohydrates, free sugars, and sodium in each category were evaluated. Based on principles of semi-continuous NutritionProfile Model, we set up boundary conditions for including indicators of high/low thresholds, scoring bands (0-10 points), and scoring band assignment, used orthogonal design to establish several combined scoring scales. After validation a Dietary Nutrition Index (DNI) and the Nutrient-Rich Foods Index (NRF8.2) was established.

Keywords: restaurants dishes, nutrient composition, distribution of content, nutrient profiling model

(P1.14) *Keeping food composition databases current in the absence of chemical analyses funding: Harnessing private-public partnerships in data compilation*

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Background and objectives: Food composition databases (FCDBs) are essential tools for public health, nutrition research, and food policy development. As dietary patterns evolve and new foods emerge, it is imperative that FCDBs remain dated to reflect current food trends and consumption patterns. This study examines the need for regular updates to FCDB and highlights how new data and recipes were incorporated manually, using newer recipe calculation methodology, and aligning data to sodium policy requirements, for selected food groups.

Methods: A call to manufacturers to contribute to the update of the FCDB was made, following national sodium legislation. Four food group chapters most affected by sodium reduction legislation (cereals, meats, fats, soups) were targeted. Recipe methodologies were integrated, enabling the calculation of real-time nutrient projections. The updated database was developed using a combination of manufacturer laboratory analysis, collaboration with food industry stakeholders, and the incorporation of data from recipe calculations.

Results: The updated database provides comprehensive nutritional information for a broader variety of foods (n=1857), which have been reformulated and aligned to latest regulatory requirements. A total of 116 new foods, 16 amendments to current food codes and 9 new recipes were added across four food groups. Recipe data projections increased data sources to 24% of total data reported (n=454 foods); whilst country specific data counts reached 49%.

Conclusions: Regular updates to FCDBs are required to ensure their relevance in an evolving food landscape. The integration of recipe methodologies, in the lack of analytical resources, enhanced the utility of these databases, supporting informed dietary choices and policy decisions.

Keywords: recipe, sodium update, database, country-specific database

(P1.17) *Building food composition data resources for dietary assessment in Hawai'i and the US Affiliated Pacific*

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Background and objectives: Food composition data for Hawaii is limited, as Hawaii is not included in the US National Health and Nutrition Examination Survey, and US food composition databases and assessment tools are based on this survey. This gap creates barriers to accurate dietary assessment. Locally important foods (imported, grown and produced) need to be integrated into databases for clinical, research, programmatic and policy use. Given the logistical and financial challenges of sample collection and analysis in the remote Pacific region, local capacity development is important to yield quality analysis of fresh local foods. Further, engaging local communities is essential to ensure priority foods are selected and contextualized appropriately.

Methods: We employ a community based participatory approach, engaging local and global communities, conducting dietary intake research to identify gaps in needed food composition data, and prioritizing local foods for nutrient analysis and building of local food composition data for diet assessment tools. Recent partnership with the Periodic Table of Food Initiative (PTFI) will play an important part in filling the gap.

Results: Key foods are prioritized through analysis of regionally collected dietary data and community consultation. Pacific-specific food composition data are identified for analysis using standard protocols from FoodDataCentral in the US and the Periodic Table of Food Initiative's MarkerLab globally, so that the data can be integrated into publicly available local, national, and global food composition data repositories, and ultimately for use in dietary assessment tools such as the Pacific Tracker.

Conclusions: Foods of the Pacific Region are not all represented in existing databases and have may have food composition properties different from commonly consumed foods in the US. Partnership with local and global communities, compiling food composition data, and building local analytical capabilities enhances the accessibility, accuracy, relevance and sustainability of food composition data for dietary assessment, research, community programs, and policy applications for the Pacific.

Keywords: food composition analysis, food composition data, dietary assessment, Pacific

(P1.20) *Nutrient composition of Thai mushrooms and impact of cooking methods*

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Background and objectives: Thai mushrooms are underrepresented in food composition databases despite their nutritional value. This study examines the nutrient profiles of ten Thai mushroom species and investigates the effects of boiling, stir-frying, and grilling on their nutrient content. They are *Volvariella volvacea* (Straw), *Astraeus hygrometricus* (Barometer Earthstars), *Lentinus sajor-caju* (White Wood), *Pleurotus ostreatus* (Oyster), *Lentinula edodes* (Shiitake), *Flammulina velutipes* (Golden Needle), *Auricularia auricula-judae* (Ear), *Pleurotus pulmonarius* (Bhutan), *Amanita vaginata* (Egg), and *Termitomyces fuliginosus* (Termite).

Methods: All nutrient analyses were conducted using standard or validated methods from the Official Methods of Analysis (AOAC, 2023). This ensured consistency and reliability in the determination of moisture, protein, fat, dietary fibre, minerals (calcium, magnesium, phosphorus, sodium, potassium, iron, zinc, copper), vitamins (B1, B2, Niacin, B12, folate), and other nutrients. To assess the impact of culinary preparation on nutrient content, samples were subjected to boiling, stir-frying, and grilling. Each cooking method was standardized to ensure consistency across all samples.

Results: Results showed significant variability in moisture, ranging from approximately 78.8 to 96.0 g/100g EP. All mushrooms exhibited high protein levels, with maximum values reaching 3.2 g/100g EP. Fat content remained relatively low across species and cooking methods (max 5.7 g/100g EP). Total dietary fibre levels were significantly influenced by cooking methods, the highest values of 12.0 g/100g EP in stir-fried Barometer earthstars. Calcium, magnesium, phosphorus, sodium, potassium, iron, zinc, and copper was generally low across all raw and cooked mushrooms. Iron content also showed notable differences, with raw Termite mushroom containing particularly high levels (9.34+1.67 mg/100g EP). Vitamins (B1, B2, Niacin, B12, and folate) were generally low but decreased after cooking. Fresh white wood mushroom contained 76.5±4.9 µg/100g EP of folate, while ear mushroom had lowest folate (3.0±0 µg/100g EP). Notably, fresh oyster mushroom exhibited remarkably high vitamin D levels (14.88+9.19 µg/100g EP).

Conclusions: This study contributes to the Thai food composition database, informing dietary choices and optimizing mushroom-based products. It highlights the importance of cooking methods in modulating nutritional value, supporting sustainable healthy diets.

Keywords: nutrient composition, mushroom, food composition database, cooking

(P1.21) *Chemical evaluation and nutritional benefits of dietary additives formulated from fruit peel blends*

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Background and objectives: Food insecurity and malnutrition remain global concerns, exacerbated by wastage of nutrient-rich plant foods and their underutilised parts. Fruit peels, often discarded in food consumption and processing, contribute to substantial nutrient loss and food waste. This study formulated and evaluated fruit peel blends and assessed their micronutrient composition, phytochemical content, and antioxidant activity.

Methods: An experimental approach was employed, processing nine fruit peels into three primary blends: orange-lemon-mandarin (OLM), pineapple-cucumber-green apple (PCG), and watermelon-guava-red apple (WGR), each with three variations (A, B, C). The peels were cleaned, dried, de-bittered, and milled before laboratory analysis using AOAC standard methods. Data were statistically analysed using ANOVA on SPSS version 20.0, with significance accepted at $p<0.05$.

Results: The results revealed significant variations in micronutrient concentrations and antioxidant activity. Vitamin A content ranged from 9.41±0.01 mg/100g (WGRC) to 28.8±0.06 mg/100g (PCGC). Among the vitamins, ascorbic acid was the most predominant, with PCGB recording the highest value (45.3±0.02 mg/100g). Flavonoid varied significantly, from 42.76±0.01 mg/100g (PCGC) to 76.83±0.04 mg/100g (OLMB). Phytate and oxalate were also present, with OLMA having the highest total phenol content (19.80±0.01%). PCGC exhibited remarkable antioxidant activity, being highest in carotenoid, FRAP, and metal chelating activity. The blends also contained essential micro and macro elements, with OLMA recording up to 2.2±0.03 mg/100g of iron.

Conclusions: These findings highlight the nutritional potential of fruit peels, advocating for their utilization as dietary additives to reduce waste and enhance nutritional value. Promoting their processing and consumption could contribute to sustainable nutrition solutions.

Keywords: fruit peels, dietary additive, food waste, nutrients, antioxidant

(P1.25) *Nutritional scoring for targeted interventions: a case study on Mediterranean and American junk diets*

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Background and objectives: Understanding food's molecular composition is essential for integrating diets into disease management. Standardized multi-omics tools and global food composition databases offer new insights, but the lack of synthesis metrics limits their utility. This study, as part of the PTFI Data Challenge, develops a scoring system using PTFI's multi-omics database to rank foods by health impact, enabling healthier diet adaptation and targeted nutritional interventions.

Methods: The nutrients, common to most foods in the database: monounsaturated fats, omega 3, omega 6, saturated fats, trans fats, protein, potassium, calcium, magnesium, zinc, selenium, sodium and phosphorus were the basis for scoring. Sodium and trans-fat are considered unhealthy compounds and the rest considered beneficial (Albuquerque et al., 2018). The ranking function evaluates the 500 reference foods in the database by nutrient concentration, assigning scores based on rank for each nutrient. Healthy compounds receive higher scores for greater concentrations, while unhealthy compounds are inversely scored. This scoring system is validated on the Mediterranean diets and American junk food.

Results: The Mediterranean diet scored 350, outperforming the American junk diet's 281. The system showed the nutritional disparities, particularly in saturated fats, omega-3, omega-6, sodium, and phosphorus. The junk diet had higher sodium and omega-6, while the Mediterranean diet was richer in omega-3 and zinc, which reflects their contrasting health impacts.

Conclusions: The scoring system effectively distinguishes diets by nutritional quality. Importantly, the Mediterranean diet can be replicated in the USA, where most of the first 500 foods were sampled. This adaptability demonstrates its potential for integration into diverse dietary cultures without compromising nutritional quality.

Keywords: food composition databases, nutritional scoring system, dietary interventions

(P1.27) *Expanding data on the phenolic composition and antioxidant capacity of Brazilian coffee beverages filtered with different ingredients*

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Background and objectives: Coffee is a major dietary source of phenolic compounds and antioxidants; however, variations in its composition—particularly regarding the presence or absence of caffeine, milk, and sugar—remain underexplored in nutritional databases. Given the renowned quality of Brazilian coffee, it is critical to accurately assess and differentiate its antioxidant potential. Detailed information on the bioactive composition of various coffee formulations is essential to enhance food databases and support research in nutrition and food technology. This study aimed to generate new data on the antioxidant capacity (evaluated by ABTS and ORAC assays) and total phenolic content of filtered coffee beverages, comparing caffeinated and decaffeinated versions and assessing the impact of adding milk and sugar.

Methods: Eight formulations of filtered coffee were analysed: the caffeinated versions included pure coffee (CCP), coffee with sugar (CCS), coffee with milk (CCM), and coffee with milk and sugar (CCMS), while the corresponding decaffeinated formulations were designated as CDP, CDS, CDM, and CDMS. Antioxidant activity was quantified using the ABTS and ORAC assays, with results expressed in µmol Trolox equivalents per 100 mL, and total phenolic content was determined via the Folin-Ciocalteu method, expressed in mg gallic acid equivalents per 100 mL.

Results: The analyses revealed that the presence of caffeine and the exclusion of milk were directly associated with higher antioxidant capacity and increased concentrations of phenolic compounds. CCP exhibited the highest values across all assays, with ABTS, ORAC, and total phenolic values of 202.0 µmol Trolox equivalents/100 mL, 5034.0 µmol Trolox equivalents/100 mL, and 1146.75 mg/100 mL, respectively. The addition of sugar (CCS) further enhanced antioxidant activity as measured by ORAC, reaching 6786.4 µmol Trolox equivalents/100 mL, whereas the inclusion of milk (CCM) significantly reduced both phenolic content (719.40 mg/100 mL) and ABTS-measured antioxidant activity (163.0 µmol Trolox equivalents/100 mL). Overall, the decaffeinated formulations exhibited lower values, with the CDMS showing the lowest parameters: 83.0 µmol Trolox equivalents/100 mL for ABTS, 859.0 µmol Trolox equivalents/100 mL for ORAC, and 531.37 mg/100 mL for total phenolics.

Conclusions: These findings suggest that CCP demonstrates the greatest functional potential, characterized by high total phenolic content and robust antioxidant activity, while the addition of sugar appears to enhance antioxidant capacity and the incorporation of milk significantly diminishes these beneficial properties, indicating that consuming coffee without additives may be the most advantageous approach for maximizing antioxidant benefits.

Keywords: filtered-coffee, ABTS, ORAC, antioxidant-activity, milk

(P1.28) *PhInd: a database for polyphenol composition in underutilized agri-food by-products and waste*

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Background and objectives: Food composition databases are essential for advancing nutrition research, informing policy decisions, and supporting the transformation of food systems. Addressing food waste is a global priority, as emphasized in the United Nations Sustainable Development Goal 12, which aims to reduce food waste per capita by 50% by 2030. However, existing datasets remain fragmented and often lack comprehensive information on bioactive compounds derived from underutilized food sources, e.g. agri-food by-products.

PhInd is the comprehensive structured, open-access database that compiles polyphenol composition data from agri-food by-products. PhInd organizes information on polyphenol content, industrial processing origins, extraction and pre-treatment methods. By filling critical gaps in food composition data, PhInd potentially facilitates the integration of these underutilized sources of bioactives into new food product formulations, supports sustainable development, and strengthens food system transformation efforts.

Methods: PhInd was developed through systematic data extraction from 690 peer-reviewed studies (2015–2021), following HPLC-based polyphenol quantification. Data compilation followed four subsections: classification of by-products (fruit, vegetable, nut, grain, herb, etc.), processing source categorization (industry/laboratory scale), pre-treatment and extraction method mapping. Base development included double-verification process to ensure data accuracy. PHP programming language and CakePHP web framework were used as tool to develop PhInd which was integrated into a publicly accessible MySQL database (https://phind.uns.ac.rs/).

Results: PhInd currently contains >6,000 data entries, compiled from 690 scientific publications. According to plant classification, the majority of the entries are fruit by-products (73.2%). Other contributors include herbs (6.8%), nuts (6.4%), vegetables (5.5%), while by-products from other plant classes each account for less than 5% of total entries. The database highlights notable differences in polyphenol composition between industry-derived and laboratory-derived samples, emphasizing the need for harmonized reporting standards in food composition databases.

Conclusions: PhInd provides comprehensive polyphenol composition data on underutilized but polyphenol-rich by-products, which are often overlooked in existing food composition datasets. PhInd can contribute to improving dietary recommendations, supporting sustainable product development, and informing food policy. Future developments should focus on expanding coverage to lesser-studied food side streams, ensuring comprehensive representation in global food com

Keywords: agri-food by-product composition database, polyphenols, agri-food by-products, underutilized plants, circular food systems

(P1.31) *WALNUT-BDA: a tool for dietary assessment in nutritional epidemiology*

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Background and objectives: The proper use of a food composition database (FCDB) is crucial for accurately estimating daily energy and nutrient intake in diet monitoring. Several web applications designed for nutritional research already exist. However, to our knowledge, there is a lack of a flexible tool addressed to researchers in nutritional epidemiology. Therefore, we aimed to develop a web application in which to: design food frequency questionnaires (FFQs), administer questionnaires or food diaries/recalls to study participants, and easily manage data.

Methods: A cloud-based web application for nutritional epidemiology was developed by expert nutritionists from the University of Udine in collaboration with an external company. Automated calculations of daily energy and nutrient intakes have been included in the code by combining data from frequency of consumption (daily, weekly, monthly, annual, or cyclic/seasonal) and portion size (open, predefined, or guided with images: small/medium/large), with data from the FCDB for Epidemiological Studies in Italy (BDA). To ensure maximum flexibility, it is possible to modify/update existing BDA foods and to add new foods and nutrients.

Results: The application is named WALNUT, which stands for Web Assessment on Lifestyle and NUTrition, followed by -BDA to indicate the reference FCDB (walnut-bda.it). The tool is divided in sections: “BDA”, to manage FCDBs; “Complex foods”, to create FFQ complex items (food groups, recipes) using BDA foods; “Legal documents”, to add informed consent/privacy documents to be linked to specific questionnaires; “Questions”, to write open, single choice, multiple choice, branched, nested, or food frequency questions with options for open or pre-defined frequency; “Sections” and “Questionnaires”, to organize questions, to generate the link to fill in the questionnaire, to manage collected data, to view energy and nutrient estimates, and to export raw data in Microsoft Excel format. To comply with privacy regulations, each data entry is identified by a randomly generated unique code.

Conclusions: Currently, WALNUT-BDA is optimized for FFQ creation, administration, and management. Future work is planned to implement additional functions, such as the creation and administration of dietary recalls and food diaries, which are essential both to validate FFQs and to conduct specific nutritional research.

Keywords: dietary assessment, food frequency questionnaire, web application, epidemiology, nutritional analysis

(P1.32) *Nutrient and microbiological analysis of fish powders processed using traditional methods to promote their inclusion in school meals in Malawi*

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Background and objectives: Despite recognition that fish is an important source of bioavailable protein and micronutrients, and a unique source of essential fatty acids, which are important for child and adolescent development. Fish, and animal-sourced foods more broadly, are often not included in school meal programs in low- and middle-income countries in Sub-Saharan Africa. Even in countries where fish plays an important role in nutrition and food security, such as Malawi, where fish provides 17% of available animal protein and employment for 200,000 men and women, it has not been featured in school menus. To promote the integration of fish products into school meal programs which source foods from local producers in Malawi, this study aims to provide evidence on the nutrient composition and microbiological characteristics of fish powder made from usipa (*Engraulicrypris sardella*), processed using 4 different traditional processing methods (sun-dried, smoked, parboiled and pan-roasted).

Methods: Samples of four fish powders made from usipa, a small indigenous fish to Lake Malawi, processed using four traditional processing methods (sun-dried, smoked, parboiled and pan-roasted) were collected from one fish processing site in Mangochi district of Malawi for nutrient and microbiological analysis. The potential contribution of a small serving of fish powder (5g) to recommended nutrient intake for children/adolescents for key nutrients of public health concern was calculated.

Results: Nutrient analysis revealed that sun-drying and parboiling returned more protein content, 66.93g/100g and 67.25g/100g, respectively opposed to smoking (63.20g/100g) and pan-roasting (61.76g/100g). Magnesium, calcium and iron content were highest (160.94 mg/100, 3992.9 mg/100g and 80.32 mg/100g, respectively) in powder from pan-roasted usipa while powders from parboiled usipa had the highest zinc and phosphorus contents (14.80 mg/100g and 198.27 mg/100g, respectively). Fish powders made from parboiled and pan-roasted usipa were considered safe for consumption, while those made from sun-dried and smoked usipa had slightly elevated bacterial count and total coliforms.

Conclusions: Based on these findings, a 5g serving of fish powder added to porridge served in school meals can contribute 10-11% of recommended nutrient intake (RNI) for zinc, and 9-45% of RNI for iron for children age 5-13 years. The addition of a small quantity of fish powder, particularly those processed using pan-roasting and parboiling techniques, can have significant contributions toward zinc and iron content of school meals, however there is need for some improvements in the value chain to ensure food safety.

Keywords: fish processing, fish powder, small fish, school meals

(P1.34) *Assessment of composition variability of artisanal cheeses for sampling frame purposes in Cuenca, Ecuador*

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Background and objectives: The popular consumption of artisanal cheeses relies on their distinctive flavours and traditional production yet limited nutritional data difficult consumer awareness and evidence-based decision making. This study aimed to evaluate the variability in the composition of artisanal cheeses sold in markets as study case to further support regional sampling frames of artisanal dairy products.

Methods: Artisanal cheese samples (n=12) were randomly purchased from six urban markets in Cuenca, Ecuador. Fresh and sold-in-bulk cheeses (two days after production) were collected. Analyses were performed in triplicate from individual samples, determining moisture and dry matter by desiccation, ash by calcination, total fat by Soxhlet, total nitrogen by Kjeldahl, total carbohydrates (by difference), total chloride by titrimetry (all AOAC official methods). Descriptive results (mean and variation coefficient) were used to sample size calculation following the Proctor and Meullenet formula for finite population, considering an admissible error of 10%.

Results: The most variable nutrients in local artisanal cheeses were carbohydrates (2.0 – 13.6 g/100 g; CV 62.7 %), chloride (723.3 – 1211.6 mg/100 g; CV 17.0 %) and total fat (18.3 – 26 g/100 g; CV 10.1 %). The content variabilities of ash (2.9 – 4.1 g/100 g; CV 9.9 %) and total protein (15.5 – 20.9 g/100 g; CV 8.9 %) were moderate, and the least variable was moisture (47.9 – 57.5 g/100 g; CV 5.8 %). Considering the analytical limitations of the applied methodologies, variability of carbohydrates was discarded. The high variability of chloride could be related to specific recipes and added salts, but also it could be partially triggered by the poor sensibility of titration. Consequently, fat content was selected as the critical nutrient for sample calculation. It was evidenced that a sample of four units was representative enough to catch the fat variability among local artisanal cheeses from different small producers in Cuenca, Ecuador. In contrast, if chloride were used, the sample size would rise up to 10 samples.

Conclusions: Moderate variability among local artisanal cheese was observed and, considering the sample calculation, the average composition can be drawn from this data. These findings highlight the importance of assessing variability of artisanal products and define criteria for selecting the critical nutrient in order to set sampling frames and to ensure representativeness in the generation of food compositional data.

Keywords: artisanal cheese, nutrient composition, sample size, critical nutrient

(P1.41) *Nutrient composition of commonly consumed fish in Thailand and effects of cooking methods*

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Background and objectives: Fish plays a crucial role in the diets and livelihoods of people worldwide, including Thailand, due to its high-quality protein, easy-to-digest nutrients, unsaturated fats, especially omega-3 fatty acids, vitamins, and minerals. This study investigates the nutrient composition of ten fish species (five freshwaters and five marine) commonly consumed in Thailand, based on the 2014-2015 Thai food consumption survey and lack information in Thai food composition database.

Methods: Fish samples were purchased from markets in Samutsakorn, Chonburi, and Bangkok, prepared using household practices, and cooked by boiling, frying in palm oil, and roasting. Edible portions were homogenized, freeze-dried, and analysed for nutrients, minerals, vitamins, and cholesterol using standard AOAC (2023) and/or validated methods.

Results: Results showed significant variability in moisture content (35.5 to 77.8 g/100g edible portion, EP). All fish had high protein content (18 to 35 g/100g EP), varying by species and cooking method. Raw fish fat content ranged from 1.3 to 12.6 g/100g EP, with significant variations observed between species and cooking methods (4.7 to 28.2 g/100g EP in freshwater fish and 1.7 to 13.8 g/100g EP in marine fish). Marine fish generally had lower fat content than freshwater fish. Potassium and phosphorus levels varied widely (84 to 499 mg/100g EP and 156 to 828 mg/100g EP, respectively). Marine fish was a better source of omega-3 fatty acids (0.01 to 1.50 g/100g EP). Fish were rich in vitamin B12 (0.8 to 18.0 µg/100g EP) and contained cholesterol (32 to 107 mg/100g EP). Vitamin D content was higher in raw freshwater fish (2.42 to 48.5 µg/100g EP) compared to marine fish (2.94 to 4.69 µg/100g EP).

Conclusions: This study highlights the biodiversity of fish species in Thailand, contributing to the richness of the Thai diet and underscoring the importance of preserving aquatic biodiversity to maintain the nutritional quality of fish consumed. This study provides valuable data on the nutrient composition of commonly consumed fish in Thailand and the effects of cooking methods, enhancing the Thai Food Composition Database. The findings also have significant implications for public health, as fish consumption can contribute to improved health outcomes through its nutrient-rich profile.

Keywords: nutrient composition, freshwater fish, marine fish, cooking methods

(P1.63) *Challenges in providing comprehensive fish and seafood composition data*

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Background and objectives: FISHEUTRUST (Project ID 101060712) is developing tools to maximise trust in fish and seafood quality, safety, and traceability, leveraging a range of smart technologies and genomic and isotopic methods as well as blockchain. These tools will be integrated into the FishEUTrust digital platform, providing a unified approach to traceability. More specifically, FISHEUTRUST wants to enhance understanding of nutritional quality and the role fish and certain seafoods in reducing the global burden of disease. To that end, EuroFIR is updating the SEAFOODTOMORROW dataset and supporting development of the FishEUTrust platform to facilitate data sharing with actors in the value-chain and consumers.

Methods: The SEAFOODTOMORROW dataset (DOI 10.5281/zenodo.7825958; GA No 773400), initially established in 2018, is being updated using automated searches across 39 food composition databases (FCDBs), incorporating new countries and expanded fatty acid data. Harmonisation was achieved by standardising units, identifying outliers, and addressing duplication. Weighted averages are being calculated for nutrient values, and new datasets for fish and seaweed composition have been created, ensuring compatibility with emerging digital tools and technologies.

Results: Updating the dataset revealed different challenges, including inconsistencies in data formats, units, and nutrient definitions across FCDBs, as well as methodological variations in nutrient analysis. Missing data and gaps in coverage for fish– especially in low- and middle-income countries – and macroalgae species further highlight limitations in current datasets. Despite these issues, integration of additional data points and development of weighted averages will improve dataset comprehensiveness. These results will inform design of the FishEUTrust platform, ensuring delivery of accessible and reliable composition data, as well as national compiler organisations.

Conclusions: Providing high-quality, harmonised fish and seafood composition data remains challenging due to methodological inconsistencies and data gaps and errors. However, the updated SEAFOODTOMORROW dataset addresses some of these challenges by leveraging standardised methodologies and advanced digital tools. This work supports greater transparency, promotes consumer trust, and underpins research into the health benefits of fish and seafood consumption in Europe.

Keywords: SEAFOODTOMORROW, FISHEUTRUST, data format, data units, nutrients

(P1.148) *Contribution of updating the Portuguese Food Composition Table to healthy and sustainable food choices*

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Background and objectives: Portuguese Food Composition Table (FCT) is an essential tool for healthcare professionals, researchers, food industry, and consumers, providing detailed information on the nutritional value of foods. In the current context, where the promotion of healthier and more sustainable diets is a priority, the continuous updating of the FCT is indispensable to accurately reflect changes in food production, product reformulation, and consumption patterns. This work aims to highlight the priorities of updating the Portuguese FCT in order to fill gaps in existing data.

Methods: The update of the FCT is a continuous and internationally harmonized process, using FoodCASE® software, which is used by nine countries and various European projects following EuroFIR requirements. Data are generated according to EuroFIR standards, ensuring quality and comparability. The inclusion of new foods is based on the National Food and Physical Activity Survey (2015-2016), with a special focus on plant-based foods, following dietary tendencies and identifying gaps. Laboratory analyses are conducted at the National Institute of Health Doutor Ricardo Jorge, using samples representative of national consumption. New foods are compiled using analytical data, extrapolation from analogous foods, international databases, and nutritional labelling.

Results: Identification of new foods has been based on the National Food and Physical Activity Survey (2015-2016), with a focus on those consumed by individuals following a vegetarian diet. The new version of the FCT (v 7.0 - 2025) will include 1339 foods, classified in FoodEX2 up to the 3rd level and 50 components/nutrients, will include results for iodine and selenium and for the first time results for 6 carotenoids in vegetables and fruits. Introduces 9 new foods and 1417 changes, including descriptions, removal of obsolete items, addition of edible portions, and value updates, considering the reduction of salt, sugars, and saturated fats in line with public health guidelines and industry trends. FCT is freely available online, allows searches by keyword, food group, components, and alphabetical list, nutritional comparisons between foods within the same or different groups.

Conclusions: Updating the FCT is a fundamental step to ensure the quality and reliability of the nutritional information available. Regular updates will help guide public policy, support nutrition research, and promote healthier, more sustainable food choices. Strengthening international cooperation and leveraging new technologies for data collection and analysis will be key to ensuring a robust and up-to-date food composition database.

Keywords: food composition databases, EuroFIR, FoodCASE, quality, harmonization, new components

(P1.151) *Generation of new analytical data on the nutrient composition of UK beef – study design and analyses*

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Background and objectives: It is essential that food composition data is relevant, accurate and up to date as it is the foundation and plays a fundamental role in nutrition, dietetics and understanding health. Key users of the UK Composition of Foods Integrated Dataset (CoFID) include the National Diet and Nutrition Survey (NDNS) who rely on the data to estimate intakes of the UK population. NDNS is essential for nutritional risk assessment by the Scientific Advisory Committee on Nutrition and provides the evidence base for policy development. Within CoFID, meat and dairy products were last analysed in 1992 and since then analytical methods have progressed in addition to evolving farming practices and processing methods, all of which may affect their composition. Therefore, analytical surveys of animal-based food groups are being undertaken including popular cuts of beef sold in the UK.

Methods: To determine which cuts of beef to include, discussions were held with stakeholders, the Department of Health and Social Care (DHSC) and the Agriculture and Horticulture Development Board (AHDB). Additionally, insights from industry data were evaluated alongside market share and NDNS food consumption data to ensure the sampling procedure was representative of current purchasing patterns. Both raw and cooked samples were selected for inclusion, each comprising 10 subsamples purchased from different supermarket chains which were homogenised to form a composite sample. For cooked samples, standard cooking methods were agreed based on recommendations by AHDB and on-pack cooking instructions. Additional ingredients such as oil and water were avoided in the cooking process; the weight loss of each cooked product was measured thus that it could be used to calculate additional nutrients that were not analysed.

Results: In total N=25 composite samples including both raw and cooked states were analysed. Medallion steak was a new product selected for inclusion which was not available for purchase during the previous survey. Casseroled diced beef was selected as a replacement for beef stewing steak (1992 survey), in line with current common practice. Minced beef is now very popular thus N=3 separate mince products were analysed with varying fat contents generating more granular data on the nutrient profile compared to the previous survey.

Conclusions: A new analytical survey of raw and cooked beef cuts was undertaken to define current composition of UK beef. The reported protocol will be applied in future analytical surveys to update food groups in CoFID and for use in NDNS.

Keywords: analytical survey, nutrient updates, animal products, food composition

(P1.169) *Proximate, minerals and vitamin composition of edible forms of commonly consumed processed fish products marketed in Delta State, Nigeria*

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Background and objectives: Fish is a staple for Nigerians throughout the year, especially traditionally smoked and dried fish. Of the >37 fish species consumed in Nigeria, information is lacking on key species after common postharvest processing and preservation methods, such as smoking and drying. This study was designed to determine the nutrient composition of processed fish products in their commonly consumed forms.

Methods: Seventeen fish species were obtained from six markets that were purposively selected. In each market, a sample of each fish species was purchased from seven vendors. The samples were placed into sterile zip lock bags, and identification details of each sample, including the common name, scientific name, and location of sample collection, were documented. The samples were then placed in Styrofoam boxes with ice packs and transported to the laboratory and stored in the freezer until ready for sample preparation. Similar samples from each market were pooled to form composite sample for analysis. The fish samples were prepared for analysis in the forms they are typically consumed in Nigeria, namely; whole, fillet, fillet with skin, and fillet with bone; dried in an air-oven drier at 60oC and ground into fine powder. The ground sample were analysed for proximate and mineral composition using standard procedures. The B-vitamins were analysed using HPLC and vitamin E by spectrophotometric method. Analysis was done in duplicates and means ± SD were calculated for each sample.

Results: Moisture content of smoked fish samples were higher (55-60%) than smoked dried samples (12%-29%). Protein varied from 17% - 59% depending on the part of fish in question and the moisture content of the fish. The fat content ranges from 4.44% in smoked stock fish fillet ("panla") to 19% in smoked dried catfish fillet. The fish species proved to be poor sources of iron (0.02 mg- 6-12mg/100g) {except for *Gymnarchus niloticus* (15.13mg/100g), smoked dried bonga fillet (12.16mg/100g) and whole smoked dried brown clupeid (18.68 mg/100g)}, poor source of zinc (0.15 ±0.07 mg – 5.04 ±3.53mg/100g); moderate sources of sodium (3.58 ±1.33 – 36.72 ± 3.63mg), phosphorus (59.81 ±4.33 – 233 ±34.25) and potassium (18.30 ±2.09 – 57.38 ±9.62mg/100g) and abundant sources of iodine, selenium, calcium and magnesium. Fish had good amounts of the B-vitamins (B2, B3, B9, B12) and vitamin E. Vitamin B1 was found to be very low (< 0.1 mg/100g).

Conclusions: There are very wide variations in the nutrient composition of the fish species in this study, underscoring the need to disaggregate the data on the composition of these species. The data obtained in this study will be very useful in updating the national food composition database for Nigeria.

Keywords: commonly consumed, processed fish product, edible forms, nutrient composition, Nigerian market

(P1.174) *Assessment of honey quality at individual apiary in Vevchani district*

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Background and objectives: Honey is a natural product with significant nutritional, medicinal, and economic value. Ensuring its quality and authenticity is essential for consumer safety and compliance with regulatory standards. This study aims to examine the physicochemical properties of light (meadow honey) and dark honey (derived from linden and chestnut) varieties and evaluate their quality in accordance with national and international standards. The key parameters—pH value, moisture content, and hydroxymethylfurfural (HMF) levels—were analysed to assess honey quality and authenticity.

Methods: Four honey samples were collected from two conventional apiaries of "Apiary Batkoski" in the Vevchani region, Southwestern Macedonia. Laboratory analyses were conducted in accordance with the Official Gazette of the Republic of North Macedonia No. 67/2011 and the Codex Alimentarius guidelines. The pH value was measured using a digital pH meter, moisture content was determined by the refractometric method, and HMF levels were analysed spectrophotometrically to detect potential thermal degradation of the honey.

Results: According to the obtained results, pH values ranged from 3.75 to 4.91, with light honey exhibiting higher acidity than dark honey. Moisture content varied between 14% and 17%, with significantly higher values observed in dark honey ($p < 0.05$). HMF concentrations remained within regulatory limits, indicating minimal thermal degradation and proper storage conditions. The mean pH, moisture content, and HMF levels were 4.23, 14.5%, and 8.93 mg/kg for light honey, and 4.81, 16.5%, and 11.63 mg/kg for dark honey, respectively. The observed variations highlight the impact of botanical origin and environmental factors on honey composition, with chestnut-linden honey exhibiting higher moisture and HMF levels compared to meadow honey. These findings contribute to the understanding of honey quality parameters and their variation across different floral sources and production years.

Conclusions: This study highlights the importance of physicochemical analysis in ensuring the quality and authenticity of honey. The results demonstrate that the honey from "Apiary Batkoski" meets high standards and shows no signs of degradation or improper processing. Future studies could include more samples and advanced analytical techniques, such as chromatography for a more detailed assessment of honey quality. Additional research on honey from the next beekeeping season will be conducted and incorporated into the final version of the paper before its presentation at the congress.

Keywords: honey quality, physicochemical properties, food analysis, HMF

(P1.187) *Revalorization of amaranth fractions before and after popping: nutritional and functional assessment*

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Background and objectives: Amaranth is a highly nutritious pseudocereal, and its byproducts from different processing stages can be revalued to obtain additional functional benefits. This study evaluates the physicochemical and nutritional properties of amaranth fractions obtained before and after popping, as well as the byproducts obtained during this process, and determines their potential applications in food products.

Methods: Six amaranth-derived samples were analysed: whole seeds, unpopped seeds, popped grains, amaranth concentrate, and derivatives such as flour and bran. Physicochemical parameters (moisture, protein, fat, carbohydrates, fibre, and polyphenols) were determined using standard methods (NOM and NMX norms). Lipids and amino acids profiles and mineral content were also evaluated.

Results: Protein content ranged from 14.69 to 41.20 %, with the highest values in the amaranth concentrate fraction. Popped amaranth showed a significant reduction in moisture (2.7%) compared to non-popped seeds (7.5%), indicating improved shelf-life stability. Polyphenol content varied across samples, with higher concentrations found in non-popped seeds. The fatty acid profile revealed low levels of trans fats (<0.01 g/100g). The amino acid profile revealed that leucine (6.87-7.85 g/100g protein), lysine (5.18-7.54 g/100g protein), and glutamic acid (22.87-28.40 g/100g protein) were the most abundant. The essential minerals such as zinc and iron were present in considerable amounts.

Conclusions: The study highlights the potential of amaranth processing byproducts for food applications, particularly due to their high protein, fibre, and mineral content. These findings support the strategic utilization of amaranth fractions to develop value-added functional foods.

Keywords: amaranth, food revalorization, popping process, nutritional evaluation

(P2.35) *Application of LanguaL™ for harmonized food description: outcomes and insights from Food Composition Database of Cuenca, Ecuador*

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Background and objectives: Worldwide, food composition data often suffer from inconsistencies in nomenclature and classification, which hamper data comparability and international harmonization. To standardize food description and classification, a locally adapted protocol for applying the LanguaL™ system was developed for the Food Composition Database (FCDB) of Cuenca, Ecuador.

Methods: A standardized protocol was implemented to classify food items from the FCDB of Cuenca, Ecuador using LanguaL™ descriptors. A total of 129 food items were analysed. A bibliographic review of traditional recipes was conducted to validate reference preparations for non-raw foods (n=108). To comply to the descriptors, a harmonized database was developed recording detailed information on each item. An analysis of recurring patterns in descriptive attributes was conducted to identify prevalent cooking techniques and ingredient usage within the regional culinary context.

Results: The adapted protocol and the validated recipe collection facilitated uniform food description and resulted in a comprehensive database containing detailed, harmonized descriptors for the Cuenca food items. Recurring patterns in the recipe database highlighted the popularity of oven-roasted and fried preparations, along with a reliance on traditional and locally significant ingredients (lupin, boiled corn -mote-). These findings highlight emphasis on regional culinary techniques and staple ingredients in the regional dataset. Limitations include that the classification system does not fully account for distinctive food shapes (in pastry), and some cooking methods (such as blending), leading to occasional inconsistencies. Additionally, multi-ingredient local foods may difficult the listing of multiple components in the system, which may limit accuracy of ingredient representation.

Conclusions: The implementation of the LanguaL™ protocol on the FCDB of Cuenca, Ecuador has helped harmonizing food classification and provided valuable insights into regional culinary trends. Addressing the current limitations by incorporating additional descriptors and revising the handling of mixed compositions will further enhance the precision and utility of the system for international data comparability.

Keywords: LanguaL™, food composition database, Cuenca, harmonization

(P2.46) *Exploring the nutrient composition of different types of blue foods and their significance in delivering essential nutrients*

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Background and objectives: Reliable, high-quality data on the composition of foods intended for human consumption are essential for numerous applications within the food system. These include dietary assessment, clinical and epidemiological research, public health policy development, consumer education, and food industry practices such as product labelling and formulation. In this context, seafood, often referred to as "blue foods," plays a critical role in delivering essential nutrients. This presentation aims to highlight the nutritional composition of seafood, emphasising its contributions to human health, while also acknowledging associated risks from contaminants.

Methods: This review synthesises current knowledge on the proximate composition, key macronutrients, micronutrients, and bioactive compounds found in various seafood classes. Particular focus is given to the bioavailability and quality of proteins, fats (including essential fatty acids), minerals, and vitamins. Additionally, the review addresses dietary recommendations for seafood consumption and examines potential health concerns linked to environmental contaminants present in seafood.

Results: Seafood is an excellent source of high-quality, easily digestible protein rich in essential amino acids, crucial for bodily functions and overall health. It provides beneficial fats, particularly omega-3 polyunsaturated fatty acids (PUFAs), which support cardiovascular health, cognitive function, and protection against chronic diseases. Seafood also supplies essential minerals such as iron, calcium, magnesium, zinc, selenium, and iodine, each contributing to critical physiological roles like immune support, bone health, and thyroid function. Furthermore, seafood is a notable source of fat-soluble vitamins (A and D) and water-soluble B vitamins (niacin and B12). Despite these benefits, seafood can accumulate harmful contaminants, such as mercury, lead, and industrial chemicals, through environmental pollution, which poses potential health risks.

Conclusions: Seafood offers significant nutritional advantages, supporting recommendations of regular consumption (100–300 g per week) to promote health and prevent nutrient deficiencies. However, balancing the benefits of seafood intake with the risks of contaminant exposure remains crucial. Continued monitoring and adherence to safety guidelines are necessary to maximise the health benefits of blue foods while minimising potential harm.

Keywords: blue foods, fish, protein, fatty acids

(P2.47) *Quantitative determination of non-starch polysaccharides in foods using AOAC 991.43/985.29 and gas chromatography methods*

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Background and objectives: Dietary fibre (DF) refers to carbohydrate polymers that cannot be digested by intestinal endogenous enzymes but are fermented by microbes in the colon. It includes non-starch polysaccharides (NSP), resistant starch, resistant oligosaccharides, and lignin. Currently, the AOAC method is the standard method for determining the DF content of foods. However, this method also measures DF components that are not accessible to the gut microbiome and the substances formed by food processing. Plant cell walls comprise 90% of NSP, making it a valuable indicator of a diet rich in fruits, vegetables, and cereals. Therefore, measuring NSP in foods as a dietary fibre component is more accurate. This study compares the values obtained using the AOAC method and NSP measurement for cereals, seeds, fruits, and vegetables.

Methods: Freeze-dried samples were analysed in duplicates using the Total Dietary Fibre Assay Kit (AOAC methods 985.29/991.43) to determine their total, insoluble, and soluble DF content. This method involved the depolymerisation of starch and protein from the samples by enzymatic digestion and precipitation of fibre with ethanol. One portion of the washed precipitate was used for the ash determination while the other was used for the protein determination. Total dietary fibre (TDF) was calculated by subtracting the weight of protein and ash from the filtered and dried residue of the sample. The NSP determination involved enzymatic hydrolysis of starch, precipitation of NSP by ethanol, acid hydrolysis of NSP into sugar constituents and measurement of the sugar constituents using gas chromatography.

Results: The total, insoluble and soluble dietary fibre content of the samples were higher than their NSP content. All analysed samples contained more insoluble fibre than soluble fibre, except for pectin (from apple) and avocado. Fruits and vegetables generally had higher soluble NSP, except for lettuce. Moreover, fruits and vegetables have higher amounts of uronic acid than cereals and seeds.

Conclusions: The dietary fibre content analysed using the AOAC method was higher than the NSP content measured using gas chromatography. This explains the presence of other components in the TDF such as resistant starch, resistant oligosaccharides and lignin.

Keywords: dietary fibre, non-starch polysaccharides, gas chromatography, carbohydrate, resistant starch

(P2.48) *Developing and enhancing DIASA: a web-based multi-pass 24 hour-recall dietary intake assessment application for South Africa*

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Background and objectives: Sound dietary intake assessment is an important prerequisite for sound nutrition practice and research1. The challenges in collecting dietary intake data2 however, have been well-described. Technological advances have therefore been employed to shift data collection from paper-based questionnaires to electronic applications which were introduced for convenience, to reduce research burden and cost and to enhance accuracy and efficiency 2,3. This project was initiated due to the increasing need and the absence of such an application in the country. The objective of the project was thus to develop a multi-pass 24hr recall (MP24hr-R) web-based mobile application for South Africa.

Methods: A sequential phased approach was employed in the development, commencing with desk-top research and literature reviews which guided and informed the high-level architectural design aspects of the app. A consultative expert opinion process and team deliberations informed processes and approaches employed. Subsequent brain-storming sessions guided best practice for management system, process flow, reporting, export, and interface linkages to existing databases. Collected evidence informed functional requirement specifications, documenting app architecture and functionality. User acceptability testing and showcasing guided further functionality enhancing developments of the app.

Results: The project culminated in the DIASA web-based dietary intake assessment mobile application. DIASA is mainly android driven employing MP24hr-R methodology. It supports three interfaces facilitating access to research managers (RMs), fieldworkers (FWs) and SAFOODS Administration. The app allows for online registration, SAFOODS-admin review, payment, and access. It captures project, participant information and guides users to capture mealtimes, food lists, food preparation descriptions, and serving sizes. Captured data link to related SAFOODS food codes and quantities and auto-calculates portion sizes. It enables data review, submission, and alerts RMs to review recalls for approval, while failed recalls generate emails to FWs for review and resubmissions. DIASA incorporates notifications of daily summaries and allows multi-format outputs, enabling seamless linking to the composition database for statistical analyses. Enhancements allow for comment capturing and non-SAFOODS data capturing, incorporation and employment.

Conclusions: DIASA enables dietary intake capturing by means of MP24hr-R methodology, food code linking, portion size auto-calculation, multi-export modalities, non-SAFOODS data capturing, incorporation and employment as well as facilitating communication between FWs and RMs aiming to reduce the research burden and enhance accuracy of dietary intake assessment.

Keywords: dietary intake, assessment, 24hr-recall, application

(P2.49) *Phytochemical properties and antioxidant activities of fermented African locust bean and African bush mango seeds*

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Background and objectives: African locust beans (*Parkia biglobosa*) and African bush mango seed (*Irvingia gabonensis*) are traditional food sources in West Africa with potential food and nutrition security benefits. This study aimed to determine their phytochemical properties and antioxidant activities.

Methods: *Parkia biglobosa* were boiled for 20 hours and fermented for 3 days while *Irvingia gabonensis* fruits were deseeded. They were separately dehydrated (at 40oC using a digital food dehydrator), milled into powder, and analysed using standard procedures.

Results: Qualitative analysis indicated mild (+) presence of Tannins, Hydrogen Cyanide, Strerol, Phenol, Terpenoids, and Anthocyanin, while flavonoids, alkaloids, and saponin were deeply (++) present. Quantitatively, *Irvingia gabonensis* seed contained flavonoid (5.80 ± 0.00 mg/g), alkaloid (2.72± 0.0 mg/g), and saponin (3.48 ± 0.00 mg/g). Fermented *Parkia biglobosa* had flavonoid (5.7± 0.00 6 mg/g), alkaloid (2.68 ± 0.00 mg/g), and saponin (3.46 ± 0.00.mg/g). Both samples exhibited potential antioxidant activities Dpph (2,2-Diphenylpraypicrylhydrazyl-1-picrylthydrazyl) test showed the highest activity in *Irvingia gabonensis* seeds (86.44g/g), with (58.66g/g) in fermented *Parkia biglobosa*. Ferric Reducing Ability of Plasma (Frap) test indicated a prevalent increase in *Irvingia gabonensis* seed (163.88µmlo L-1 TE g) with (144.33 µmlo L-1 TE g) In fermented *Parkia biglobosa*. Fermented *Parkia biglobosa* had the highest metal chelating activity (0.77 ± 0.00EDTA equ/g), and Irvingia gabonensis seed had (0.66 ± 0.00 EDTA equ/g).

Conclusions: The samples exhibited significant phytochemical properties and antioxidant activities supporting their traditional uses in African cuisine.

Keywords: *Parkia biglobosa*, *Irvingia gabonensis*, phtochemical, antioxidant activity, fermented

(P2.50) *Australian Acacia species: a nutrient-dense food crop for diet diversity and climate resilience*

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Background and objectives: Wattle trees (genus Acacia) are well-adapted to both arid and semi-arid regions, with Australia home to over 70% of the world's 1350 *Acacia* species. Wattle seeds are found within the pod on wattle trees and are an indigenous Australian legume, with about 100 edible species, each possessing unique nutritional and sensory properties. This study aims to promote the use of underutilized crops, such as wattle seeds, to improve nutrient intake. Despite their high nutritional value, wattle seeds are not widely used in food products, highlighting the need for greater awareness and innovation in food formulation.

Methods: This study assessed the nutritional composition including minerals and trace elements, anti-nutrients and main toxic compound (djenkolic acid) of ten fast-growing and domesticated Australian *Acacia* species (*A. baileyana*, *A. hakeoides*, *A. longifolia* ssp. longifolia, *A. longifolia* ssp. sophorae, *A. microbotrya*, *A. provincialis*, *A. pycnantha*, *A. retinodes*, *A. saligna*, and *A. victoriae*). Measurements were done on an as-received basis using the AOAC methods for proximate analysis. Mineral and trace elements were analysed using the inductively coupled plasma emission spectrometry. Djenkolic acid was measured using liquid chromatography-mass spectrometry. This study also evaluated how commercial roasting (175–190°C for 2–4 minutes), the most common processing method for wattle seeds, affects their composition. Furthermore, a rapid sensory profiling of selected Acacia species was conducted to characterise their sensory attributes.

Results: Raw wattle seeds are rich in dietary fibre (39-58%), protein (19-31%), potassium (8,480-14,300 mg/kg) and iron (34-134 mg/kg) while containing low starch levels (<2%). The amino acid profile indicated many essential amino acids (64-82 mg/g). The most abundant unsaturated fatty acid was linoleic acid (58–68% of total fatty acids), while palmitic acid (6–10% of total fatty acids) was the main saturated fatty acid. Commercial roasting significantly reduced the activity of major antinutrients trypsin inhibitor by 24-90% and djenkolic acid by 35-99% depending on the species. Sensory profiling of roasted wattle seed (*A. coriacea*, *A. cowleana*, *A. retinodes* and *A. sophorae*) revealed diverse flavour attributes, including roasted nut, coffee and chocolate.

Conclusions: Wattle seeds, often referred to as an opportunity crop due to their climate resilience, have a highly nutritious profile. They are a rich source of fibre, essential amino acids, potassium, and iron, making them a valuable addition to diverse diets. Incorporating wattle seeds into bread, alongside staple flours like wheat, offers a convenient and accessible nutrient-dense food option for a wider population.

Keywords: *Acacia* species, food analysis, food composition, food processing, diet diversity

(P2.53) *Application of keyfood methodology for the development of a national food composition database in Uruguay*

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Background and objectives: The development of food composition databases (FCDB) is essential for nutritional research and public health policies. However, creating a comprehensive FCDB poses significant challenges due to the vast number of available foods and the high costs associated with physicochemical analyses. The keyfood methodology has been widely used in different countries to prioritize foods based on their contribution to key nutrients. This study aims to apply the keyfood methodology to determine priority foods for inclusion in Uruguay's first National Food Composition Database.

Methods: National-level apparent food consumption data were analysed to identify priority foods. The process involved cross-referencing apparent consumption data from the National Expenditure and Income Survey (2016-2017) with food composition data to determine key nutrients relevant to the Uruguayan population. Selection criteria considered different nutrient contribution thresholds (70%, 75%, and 80%). Food composition data were sourced from Brazil's FCDB (FoRC, 2023), and the USDA database (2023). The methodology was documented to ensure future updates and reproducibility.

Results: A ranked list of foods within each food group was generated, allowing the identification of the top 10 priority foods. These select foods will serve as the basis for designing a sampling methodology for further analytical determinations. During the first year of the study, proximate composition (moisture, ash, fibre, protein, fats, and carbohydrates), key minerals, and relevant vitamins will be analysed in eight representative samples per food.

Conclusions: Applying the keyfood methodology provides a structured and evidence-based approach to selecting foods for inclusion in a national FCDB. This process ensures that the most nutritionally relevant foods are prioritized, optimizing resource allocation for food composition analyses. Future steps will include refining analytical methods and expanding the database to support food policy and dietary assessments in Uruguay.

Keywords: food composition database, keyfood methodology, nutrient prioritization, national database development, Uruguay

(P2.54) *Glycemic response in apparently healthy subjects to three commonly consumed traditional stiff dough staples in Nigeria*

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Background and objectives: Stiff dough, known as "swallows ", in Nigeria, is a staple consumed for satiety and energy. Made from cereals, starchy fruits, and tubers, it is carbohydrate-rich, providing glucose for bodily functions. However, prolonged intake of high-carbohydrate foods may cause postprandial glycaemic spikes, increasing the risk of metabolic disorders like diabetes. Despite its widespread consumption, there is limited data on its glycaemic effects. This study examines the glycaemic response to three commonly consumed stiff dough staples in Nigeria, offering insights into their metabolic impact.

Methods: A randomized crossover design was utilized for the study. Twelve apparently healthy adult subjects with a mean age of 22.36 years, average BMI of 22.63kg/m2 and normal fasting blood glucose levels (<100 mg/dL) participated in the study. Three stiff dough staples (white rice stiff dough, yam stiff dough, whole wheat stiff dough) were tested. A reference food (50g glucose solution) was used as the standard for glycaemic index (GI) determination. Each meal was prepared under standardized conditions, providing 50 g of available carbohydrates. Each subject consumed one test meal on separate days after 10-12 hours fast, and at least a 48-hour washout period between sessions. Capillary blood samples were collected via finger prick at baseline (0 min) and at 15, 30, 45-, 60-, 90-, and 120 minutes post-consumption. The incremental area under the glucose response curve (IAUC) was calculated for each test meal using the formula: GI = IAUC of test meal/IAUC of glucose reference x 100. Data obtained were analysed using means, standard deviations, analysis of variance (ANOVA), and significance judged at $p<0.05$. Ethical approval was obtained from Lagos University Teaching Hospital Health Research Ethics Committee (LUTHHREC - ADM/DCST/HREC/APP/2744). Participants provided written informed consent before participation.

Results: The glycaemic area of the stiff dough samples was significantly lower ($p<0.05$) than the standard (12703.5 mg/dL). Among the samples, white rice and whole wheat stiff dough exhibited higher glycaemic area (11481 mg/dL and 11310 mg/dL, respectively), whereas yam stiff dough had the lowest (10930 mg/dL). Their corresponding glycaemic indices (GI) were 90, 91, and 86. These variations result from differences in processing methods, starch composition, fibre type, and macronutrient content (fat and protein).

Conclusions: All stiff dough studied had high glycaemic indices. This is an indication that prolonged consumption of such meals could predispose consumers to metabolic disorders. Portion sizes and increased fibre, fat and protein content is advised to modulate postprandial glycemia.

Keywords: stiff dough, glycaemic response, glycaemic index, glycaemic index database

(P2.59) *Nutritional composition of enriched ready-to-eat meal produced from blends of maize (Zea mays) and bambara groundnut (Vigna substarranea)*

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Background and objectives: Due to unprecedented urbanization, there have been a gradual growth in global consumption of ready-to-eat cereals especially in sub-Saharan Africa (SSA). It is also linked to nutrition transition associated to significant changes in diet, physical activity and prevalence of malnutrition1. Maize meal diets which are staple food in SSA are low in nutrients and can cause protein-energy malnutrition. Therefore, complementing maize meals with bambara groundnut, a nutritious underutilized legume can elevate the nutritional content and reduce malnutrition which is one of the United Nations goals on Zero hunger by 20302. Therefore, this work aimed to produce maize-bambara meal with enhanced sensory and nutritional quality.

Methods: The maize and bambara groundnut were purchased from a local market in Lagos, Nigeria. The maize flour was prepared using modified method of Satish et al3. The bambara flour was produced using modified method of Mubaiwa et al4. D-Optimal of mixture experimental design was used to generate nine experimental runs using ingredients combination of 65 – 90% for maize and 10-35 % for bambara. The sample are M77.50 B22.50, M65 B35, M83.75 B16.25, M90 B10, M71.25 B28.75, M77.50 B22.50, M90 B10, M65 B35, M90 B10, (where M = Maize flour and B= Bambara flour) and compared with TMS, (control). Proximate, sensory, amino acid and mineral profile were done using standard laboratory methods.

Results: The proximate composition of the maize-bambara meal showed that crude fibre, ash, protein increased significantly ($P<0.05$) with values ranging from 6.84–7.78%, 2.40-3.65%, 6.31-13.99% respectively as the inclusion of bambara flour increased. The fat content had no significant ($P\geq0.05$) difference. The sensory result showed significant ($p < 0.05$) differences across the parameters evaluated. Sample M71.25 B28.75 had the highest score of 7.85, 6.95, 5.90, 6.15 and 7.60 in colour, taste, texture, ease of swallow and general acceptability respectively while TMS recorded least scores. In the mineral content, M71.25 B28.75 had high scores of 47.7, 376.5, 769.6, 300.2, 2.6, 1.77 and 0.353 mg/day in sodium, magnesium, potassium, calcium, zinc, selenium and copper respectively while TMS had lower scores except in Fe (19.78mg/100g). The essential amino acid result of M71.25 B28.75 scored of 2.32, 4.32, 7.11, 4,32, 4.51, 2.25, 1.06, and 4.45 in histidine, isoleucine, leucine, lysine, phenylalanine, threonine, tryptophan and valine respectively while TMS had lower values but higher score of 1.22 and 5.63 in tryptophan and methionine.

Conclusions: The results showed that enriched formulation M71.25 B28.75 produced the most acceptable and nutritious maize-based meal which will be useful in combating hidden hunger problems in Africa

Keywords: ready-to-eat meal, enrich, sensory, nutritional composition

(P2.60) *Food consumption estimates for monitoring EU progress towards sustainable healthy diets*

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Background and objectives: Adequate monitoring of food consumption is crucial to support EU policy. It can regularly inform decision-makers on progress towards targets or adherence to dietary recommendations. In the EU, the EFSA Comprehensive European Food Consumption Database (EFSA database) provides reliable and representative dietary information from national surveys across Europe using harmonised data collection methods. However, these surveys are not conducted regularly, limiting their effectiveness for continuous monitoring.

Methods: We developed a method to estimate annual food consumption for key aspects constituting sustainable healthy diets by integrating data EFSA food consumption data with market sales data (Euromonitor). First, we reviewed international sources of reference for achieving sustainable healthy diets to select the food groups of interest. In the EFSA database, each food group was constructed by selecting relevant items across FoodEx2 hierarchical levels. For countries with multiple surveys, we prioritized the most recent national dietary survey, extracting adult consumption data (grams per day) from 21 EU countries, with survey years ranging from 2003 to 2019. For each country, the dietary survey year was the baseline. To project updated consumption estimates, we applied annual percentage changes from Euromonitor food sales data to adjust the baseline estimates for each food group.

Results: We computed annual food consumption estimates up to 2022 for fruit, vegetables, legumes, nuts and seeds, fish, milk and dairy, red meat, processed meat and sugar sweetened beverages for 21 EU countries. We compared our results with global modelled dietary intake data from the Global Dietary Database (2018) and the Global Burden of Disease study (2019). A comparison with our estimates revealed substantial variation across countries and food groups. In some cases, differences diverged entirely, suggesting these data sources are not directly comparable.

Conclusions: Discrepancies in food consumption estimates stem from methodological differences, such as in dietary survey selection, modelling assumptions and classification systems. In our approach, we used sales data to produce annual estimates anchored on accessible, reliable sources of information on food consumption, stemming originally from national representative food consumption surveys in Europe following common survey methodologies. By generating timely and comparable data, we aimed to provide a more fit for purpose approach to help policymakers track adherence to dietary recommendations and health and sustainability goals more effectively. In this way, we add value to the work of EU countries and EFSA on food consumption by making it more readily usable for policy making in Europe.

Keywords: food consumption, monitoring, sustainable healthy diets, sustainable food systems, EFSA

(P2.64) *Sustainability indicator framework for communicating responsible aquafood consumption*

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Background and objectives: VeriFish (project no. 101156426) has developed a comprehensive indicator framework for the aquafood sector, addressing environmental, stock management, and nutritional dimensions. This initiative aims to simplify and standardise communication, fostering informed consumer choices and enhancing transparency. By integrating verifiable data into actors' communication strategies, the framework seeks to promote responsible consumption patterns, ensure the sustainability of aquafood systems, and support good communication practices tailored to diverse stakeholder needs.

Methods: The indicators were identified through systematic review, focusing on core dimensions such as stock status, ecosystem impacts, climate footprint, governance, and nutritional attributes. The framework employs a tiered data approach: Tier 1 uses publicly available data ensuring broad availability, while Tier 2 incorporates value-chain-specific data to provide detailed, granular insights. This dual approach ensures flexibility and relevance across diverse operational contexts, facilitating adoption and integration by both small-scale and large-scale actors in the value-chain.

Results: The framework provides measurable indicators for capture fisheries, aquaculture, and nutrition, enabling assessment of key sustainability metrics such as biodiversity conservation, carbon emissions, resource efficiency, and public health. These indicators form the basis of a prototype web application that will facilitate communication of sustainability by actors and enable consumers to make more informed decisions based on their priorities, such as environmental impact, nutritional quality, or responsible production.

Conclusions: By standardising sustainability reporting and enhancing value-chain communication, the VeriFish framework enables aquafood actors to align with global environmental and health objectives. Potentially, it can foster consumer trust and empowerment, promote responsible 'advertising' practices, and pave the way for diverse, sustainable consumption. This framework represents a step toward a more transparent, equitable, and environmentally responsible aquafood sector, benefiting producers, consumers, and the environment alike.

Keywords: VeriFish, indicator framework, communication, value chain actors, sustainable food systems

(P2.65) *A Global food composition database analysis for food system transformation*

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Background and objectives: Food and the nutrients they contain are fundamental necessities for life and health. Food composition databases are valuable sources of food nutrient and composition information across the global food system. Using a food systems approach to understanding food is necessary for understanding and driving food system change, transition and transformation. A food systems approach enables a deeper consideration of the complexity of food systems, defining key interrelationships and showing the value across the whole food system that food composition data has.

Methods: This is the first stage of a major study of the global status of food composition databases, integrating them to broadly and strategically analyse their data. It took a rigorous, analytical approach by doing a systematic search to find all of the food composition databases online in the world and analysing the content of each of them. It then used a food systems approach to analyse food composition data through the food system including the activities, drivers and outcomes surrounding it.

Results: The systematic search found over 140 data sets available online which varied in the foods and processing methods they included and the number of nutrients for which values were provided. This helped to map the framework around food composition across the global food system. It shows how composition changes through the activities of the food system, from agriculture and post-harvest through processing and value-adding to diets and consumption. The effects and outcomes that food composition have include the utilisation of food, effects on individual and population health, and the on-going social benefits from the continued use of traditional and indigenous foods. Environmental drivers include soil and climate. Socio-economic and socio-technical drivers include policies and the impact of science, research and technology on the activities that affect composition. Future changes that have potential to create on-going change and transitions include increased sensitivity of analytical methods for testing composition and foodomics analysis, advances in food science including new or more advanced processing technologies and the effects of climate change.

Conclusions: Food composition databases are used globally throughout the food system and are indicative at the national level of what is considered important in food and food processing. Characterising food composition at a global level enables the effective analysis of its role in the food system, generates new insights, can support change and transition to take place and can build the foundation for transformation.

Keywords: food composition, databases, food system transformation, food system approach, foodomics

(P2.68) *Updating the Serbian Food Composition Database with essential but missing micronutrients*

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Background and objectives: Food composition data is essential for evaluating dietary intake and addressing nutritional deficiencies. The Serbian Food Composition Database (FCDB) needs an update to reflect current consumption patterns and nutrient content. This study aims to expand the Serbian FCDB by adding missing nutrient values for around 1000 food items, focusing on essential micronutrients deficient in Europe.

Methods: Nutrient data for 11 micronutrients (minerals: Ca, Fe, Mg, K, Se, Zn, and vitamins: A, folate, B12, D) will be compiled from literature and international food composition databases. The data will be harmonized according to EuroFIRTM standards. The updated FCDB will be integrated into the Diet Assess and Plan tool for food consumption data collection. Further, food consumption patterns from the EU Menu dietary survey (2017-2023) in Serbia will be analysed to identify most consumed foods in different demographic groups (age, gender, socioeconomic status) which will be than chosen for laboratory analysis of missing nutrients. Data collection challenges, like variations in food preparation and portion sizes, will be addressed through standardization.

Results: Preliminary findings identify staple foods in 13 food groups that are frequently consumed but lack data on essential micronutrients. The priority list for laboratory analysis is based on frequency and amount of consumption, while micronutrient selection is guided by overview of missing values in Serbian FCDB, common nutrient deficiencies in Europe and feasibility to perform chemical analysis. The selection process ensures foods are commonly consumed across population groups and are significant micronutrient source, available in retails/markets throughout the year.

Conclusions: This study is a first step toward building a high-quality FCDB in Serbia and the Balkan region, harmonized with international standards. Collaboration with networks like EuroFIR and INFOODS will improve data reliability and standardization. Updating the Serbian FCDB will enhance dietary assessments of critical micronutrients in Serbia, providing a foundation for nutrition policies and public health initiatives for reducing issues like hidden hunger i.e. various micronutrients deficiencies. One of the solutions is a design of targeted fortification strategies to address micronutrient gaps in vulnerable groups (e.g. children, elderly, pregnant women) which is possible by integrating food consumption and food composition data in food fortification predictive models for achieving nutritional adequacy while respecting planetary boundaries.

Keywords: micronutrients, food composition database, nutrition deficiencies, hidden hunger, Serbia

(P2.73) *The 4th edition of the South African food quantities manual: an update informed by collaborative data collection*

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Background and objectives: The South African Food Quantity Manual (FQM) aids researchers in converting food consumption data reported in household measures into grams of food for the accurate estimation of nutrient intake. Due to the constant change in food items available in the market and the updated 6th edition of the South African Food Composition Tables (2024), there was a need to update the FQM with the new food items. These updates are crucial for aligning the South African Food Composition Tables with the FQM, thereby ensuring the accuracy of dietary intake assessments.

Methods: For the new update, the previous edition of the FQM (2018) was reviewed to identify food codes lacking measurement data, while the update also focused on obtaining measurements for new items added in the 6th edition of the South African Food Composition Tables (2024). To assist with the update of the manual, the South African Food Data System (SAFOODS) collaborated with the South African Medical Research Council's Gen S job shadowing programme for high school learners. Identified food items were procured locally from the biggest national food stores. The learners were trained to perform household quantity measurements for identified food items. Additionally, online purchasing sites of these food stores were accessed for measurement information on food items not available in the food stores. Measurements were done in triplicate using an analytical scale and standardised household measuring utensils. For food items that were unavailable in local stores or lacked measurement information online, quantity data from similar foods were used to obtain the necessary measurement data.

Results: The majority of quantity measurements were added to the milk and milk products (n = 753), fats and oils (n = 388), cereals and cereal products (n = 280), and seasonings and flavourings (n = 224) food groups. The 4th edition of the FQM (2024) introduces new quantity values for 239 individual food items, bringing the total to 1,956 new food quantity values. These updates span 11 of the 16 food groups maintained by SAFOODS.

Conclusions: Updating the Food Quantities Manual is a vital SAFOODS activity that enhances the ability of nutrition researchers to accurately estimate the nutrient intake of foods consumed by various populations and currently on the market. Collaborative data collection provided an opportunity to engage students, raising their awareness of the critical role that accurate food measurements play in both nutritional research and practical applications.

Keywords: food quantities manual, household measures, collaborative, dietary intake assessment

(P2.76) *Analysis and quantification of amino acids in milk and selected non-alcoholic beverages using microwave-assisted acid hydrolysis and liquid chromatography*

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Background and objectives: Optimal growth and development during the first 1000 days of life rely on adequate nutrition, with protein being crucial. Protein provides calories and essential amino acids (AAs) needed for growth and neurodevelopment. Insufficient essential AAs can lead to protein-energy malnutrition, affecting physical and cognitive development. Accurate AA data are vital for assessing dietary adequacy. Currently, there is no laboratory-validated method for amino acid determination at DOST-FNRI, and the data for many Philippine foods are outdated. This study aims to optimize and validate a method for quantifying essential AAs in milk and selected beverages.

Methods: To quantify AAs in milk and selected beverages, an in-house method was optimized and validated. The optimization process included gradient programming for compound separation, pH adjustment, and selecting an appropriate acid digestion technique. Samples underwent microwave-assisted acid hydrolysis (Berghof digestor) followed by neutralization. AAs were derivatized with phenylisothiocyanate (PITC) and analysed using high-performance liquid chromatography (HPLC) with programmed gradient elution. The method was then validated according to Eurachem guidelines.

Results: An optimized and validated HPLC method was developed for the simultaneous determination of 15 AAs. Five AAs—cysteine, methionine, asparagine, glutamine, and tryptophan—were excluded due to instability during acid hydrolysis. The method demonstrated excellent linearity (R^2 = 0.9975-0.9998), with LODs ranging from 0.6585 to 2.7637 µg/mL and LOQs from 2.1949 to 9.2123 µg/mL Recovery rates (82.47%-103.16%) confirmed accuracy. Precision, assessed through intra-day and inter-day analyses, was within acceptable limits. The method was successfully applied to quantify amino acids in cow's milk, soy milk, whey protein beverage, and coconut milk. Total AAs content ranged from 0.074 to 1.603 g/100g. Soy milk was abundant in leucine, glutamic acid, and lysine, while whey protein drink had high concentrations of glutamic acid and leucine. Coconut milk and cow's milk exhibited distinct profiles, with arginine and glutamic acid predominating in coconut milk, and leucine, glutamic acid, and tyrosine in cow's milk.

Conclusions: This study successfully established an optimized and validated method for accurate and precise AA determination, following Eurachem guidelines. The method quantified AAs across diverse beverage matrices and demonstrates its utility for evaluating protein quality in various foods. The resulting data will enhance food composition databases and dietary assessments. Future studies should explore nuclear magnetic resonance spectroscopy (NMR) for non-destructive, multi-component analysis.

Keywords: amino acids, acid hydrolysis, liquid chromatography, phenylisothiocyanate (PITC), non-alcoholic beverages

(P2.77) *Nutrient composition analysis of daily spice consumption in Sri Lanka: implications for health*

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Background and objectives: The daily consumption of spices in Sri Lanka is deeply rooted in cultural heritage, reflecting centuries of trade and culinary evolution. Beyond their flavour-enhancing properties, spices are also highly valued for their medicinal benefits and play an integral role in traditional health practices. This study aims to analyse the nutrient composition and antioxidants in commonly consumed spices, collected from local markets in Sri Lanka.

Methods: Representative spice samples were analysed for essential nutrients, antioxidants, and heavy metals. Heavy metal detection was performed using Inductively Coupled Plasma Mass Spectrometry (ICP-MS). The proportion of nutrients and heavy metals was then compared in relation to daily dietary intake. Data from dietary surveys were combined with laboratory results to estimate the average daily spice consumption and its contribution to both nutrient and heavy metal intake.

Results: The findings suggest that the average per capita spice consumption in Sri Lanka is approximately 25 grams per day. Despite this, the intake levels do not exceed the upper tolerable intake levels for the nutrients analysed.

Conclusions: The study highlights the importance of monitoring spice consumption in the future to ensure the continued safety and health benefits of these widely used culinary ingredients. This research provides valuable insight into the nutritional impact of daily spice consumption, with potential implications for public health.

Keywords: spices, nutrient composition, heavy metals, antioxidants, dietary intake

(P2.78) *Nutritional and phenolic profile of edible flowers and mixed with black tea*

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Background and objectives: Edible flowers are becoming increasingly popular due to their rich phytochemical and antioxidant content, which contribute to their colour, flavour, aroma, and potential health benefits. Among emerging trends, edible flowers mixed with black tea have gained attention for their enhanced nutritional value, and bioactive compounds. The combination of tea with flowers at various proportions may show synergistic, antagonistic, and/or additive interactions among their components leading to variable bioactive potential. The objective of the study was to analyse the nutritional composition and polyphenol content in black tea and edible flowers at individual and at various combination ratios.

Methods: Proximate composition of edible flowers was determined following methods in AOAC International (2012) (Moisture AOAC: 934.01; Protein AOAC 954.01; total ash content AOAC: 923.03; total dietary fibre (TDF) AOAC 991.43; total fat AOAC: 922.06). TPC were determined in methanolic and aqueous extracts of black tea and individual flowers. Black tea was infused with 11 edible flowers viz., banana, butterfly blue pea, chamomile, chrysanthemum, hibiscus, jasmine, lavender, marigold, moringa, pomegranate and rose at the proportion of 6:1, 4:1, 3:1 (w/w) ratios in water. Polyphenols (epigallocatechin, catechin, epicatechin, epigallocatechin gallate and epicatechin gallate) in tea and flower infusions were analysed using UHPLC. A gradient elution program with the mobile phase composed of phosphate buffer at pH 3.33 was run to separate polyphenols and detected using DAD at 280 nm.

Results: Moringa was rich in protein (23.1%), pomegranate flowers were rich in CHO (75.9%), higher fat was observed in banana florets (7.7%), while highest TDF was observed in hibiscus (30.4%). Pomegranates, and lavender yielded significantly higher concentrations of TPC in both the extracts. In black tea, epigallocatechin (3.83 mg/g) accounted for the most, followed by epigallocatechin gallate (1.22 mg/g). Black tea infused with flowers at a 6:1 ratio (w/w) exhibited significantly higher content for all individual polyphenols studied among all infusion combinations. Highest content of epigallocatechin (21.86 mg/g) in chamomile; catechin (1.76 mg/g) in pomegranate; epicatechin (0.58 mg/g) in moringa; epigallocatechin gallate (2.17 mg/g) in marigold and epicatechin gallate (1.16 mg/g) in moringa were observed.

Conclusions: Proximate principles, and polyphenol content in black tea and edible flowers infusions were significantly elevated. Black tea and flower at 6:1 ratio supplied highest individual content of polyphenols.

Keywords: edible flowers, black tea, proximate composition, and polyphenol content

(P2.79) *Updating of the Philippine Food Composition Tables: a comprehensive, accessible, and reliable tool for nutrition and health research*

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Background and objectives: The latest edition of the Philippine Food Composition Tables Handbook was published in 1997. Since then, food production and consumption have significantly evolved, and new nutritional and health interests have become public health concerns. To address these needs, the study aimed to update the Philippine Food Composition Tables (FCT) and provide more accurate and relevant data that can aid in nutritional research-nutritional epidemiology, dietary evaluation, and nutrition labelling. It also serves as a crucial tool in crafting agricultural programs, formulating food products, and assessing food biodiversity and food security.

Methods: This study involved compiling nutrient data, reviewing and revising descriptors (food descriptions, alternate and scientific names), identifying food groups and components, and conducting data checks before publication. All methodologies followed the FAO/INFOODS 2012 guidelines, employing direct and indirect methods for generating food composition data.

Results: The generated data were published in handbook format, The Philippine Food Composition Tables 2019, featuring 1,542 food items categorized into 17 food groups, along with the introduction of six new food components: total sugar, sodium, cholesterol, saturated, monounsaturated, and polyunsaturated fatty acids. These data are crucial inputs to interventions for non-communicable diseases (NCDs) such as diabetes, kidney and heart diseases which are the top causes of morbidity and mortality in the Philippines. Crude fibre and vitamin A retinol equivalent (RE) were replaced with total dietary fibre and vitamin A retinol activity equivalent (RAE), respectively. Among the compiled data, 64.41% were analysed, while 23.61%, 10.15%, and 1.83% were borrowed and imputed from foreign databases, calculated, and presumed based on FAO/INFOODS 2012 guidelines, respectively. These data were also uploaded and available in the web-based version of Philippine FCT, or PhilFCT®, which can be accessed through the iFNRI website (i.fnri.dost.gov.ph).

Conclusions: The updated Philippine food composition data can serve as a valuable resource for various research in food, nutrition, and health. For future enhancements, it is recommended to incorporate more analytical data using advanced analytical techniques and compile data continuously to ensure current, reliable, and high-quality Philippine food composition data.

Keywords: direct method, indirect method, combination method, food data compilation, online database

(P2.80) *Assessment of mineral content in processed, ready-to-eat, and cooked foods in the Philippines*

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Background and objectives: Minerals are essential for various physiological functions, including enzyme activity, bone health, and metabolic processes. Deficiencies in minerals such as calcium, copper, iron, manganese, magnesium, and zinc can lead to health problems like osteoporosis, anaemia, and impaired immune function. Conversely, excessive intake of these minerals can result in toxicity. Thus, understanding the mineral content of foods is crucial for assessing dietary adequacy and preventing excessive consumption. The Philippine Food Composition Tables (FCT) include around 1,500 food items, but many are listed in their raw form, necessitating conversion to cooked form, which can be tedious for practitioners. This study aims to assess the mineral content of selected processed, ready-to-eat, and cooked foods for inclusion in the Philippine FCT.

Methods: Food samples were identified based on the 2018-2019 Expanded National Nutrition Survey and were collected from various retail and food establishments in Metro Manila from 2020 to 2024. Following standard kitchen protocols, raw foods were prepared in their "as-consumed" state. The essential minerals in the food samples were then measured using a developed and validated Inductively Coupled Plasma Optical Emission Spectroscopy method combined with microwave-assisted extraction.

Results: The analysis revealed significant variations in mineral content across fifty-six samples (thirty processed and ready-to-eat foods, nine ready-to-drink beverages, and seventeen cooked foods). For instance, Pandesal (Filipino rolls) and White Bread Loaf contained calcium levels of 73 mg/100g and 109 mg/100g, respectively. Iron content ranged from 0.09 mg/100g in fortified prawn crackers to 4.54 mg/100g in Pandesal. Magnesium levels also varied, with Sandwich Cookies containing 49 mg/100g and Piaya (flaky unleavened bread with sweet filling) having 3 mg/100g. Zinc levels also differed, with Sandwich Cookies showing 1.47 mg/100g and Salted Crackers at 0.64 mg/100g. In beverages, milk-based drinks like Milk Chocolate Drink (UHT processed) had significant calcium content (99 mg/100g), while fruit juice drinks showed minimal calcium and iron. Cooked foods displayed a wide range of nutrient values, with significant magnesium content in boiled Banana Saba (51 mg/100g) and high zinc levels in Corned Beef (4.22 mg/100g).

Conclusions: This study highlights the variability in essential mineral content across processed, ready-to-eat, and cooked foods consumed by the Philippine population. The findings emphasize the importance of including accurate data on mineral content in the Philippine FCT. By providing a comprehensive nutrient profile, these updated tables can better assist nutrition practitioners in assessing dietary adequacy and preventing excessive intake of certain minerals.

Keywords: mineral content, Philippino foods, nutrient assessment, processed foods, public health nutrition

(P2.82) *Nutritional composition of selected cereals, starchy roots, and tubers-based products consumed in the Philippines*

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Background and objectives: Cereals and starchy roots and tubers and their products are among Filipinos' most consumed food commodities based on the 2019 Expanded National Nutrition Survey in the Philippines. These foods are known to contribute to the daily energy requirements and nutrient intake of populations worldwide. However, nutrient information available for these food items in the country's Food Composition Tables (FCT) is limited to specific varieties and lacks data on cooked, prepared and other commonly consumed processed food items. With these, the study aimed to generate new and updated nutrient data for these food groups. This initiative is part of the continuous enhancement of the Philippine FCT to enhance coverage while ensuring the reliability of the nutrition data.

Methods: Food items with the highest consumption percentages were identified and collected in accordance with the INFOODS and ASEANFOODS guidelines. Collected samples were composited, pooled, and analysed following validated AOAC methods for proximates, minerals, and vitamins determination.

Results: A total of twenty (20) selected cereals, starchy root, and tubers - based products were analysed for twenty (20) macro- and micronutrients. Variability in nutrient content was observed across these different food items. Among these, chocolate breakfast cereals was highest in total dietary fibre (6.9 g/100g), available carbohydrates (75.9 g/100g), calcium (670 mg/100g), magnesium (87 mg/100 g), and iron (19.7 mg/100 g). Cheese-flavoured potato rings exhibited the highest total fat (33.1 g/100g). Meanwhile, uncooked instant noodles contained the highest protein (10.4 g/ 100g) and was also noted to be highest in sodium (3622 mg/100g). All the selected food products analysed in the study lacked vitamin C, while certain products bearing the Sangkap Pinoy Seal (seal for fortified foods) contained elevated levels of vitamin A, as retinol equivalent with prawn crackers chips containing the highest concentration (1035 µg/ 100g). Nutrient loss due to cooking, heat exposure, and leaching was also evident in the results of the study as observed in food items (rice and instant noodles) that were boiled or cooked as compared to its raw counterparts.

Conclusions: This study confirmed the significant contributions of cereals, starchy roots, and tubers- based products as sources of energy and vital nutrients to the Filipino diet. It underscored the importance of continuously updating the Philippine Food Composition Database to accurately reflect evolving food consumption patterns, thereby making it a more reliable and useful resource for dietary assessments and nutrition-related research.

Keywords: nutritional composition, cereals, starchy roots and tubers, food composition table

(P2.145) *Highlighting data gaps in neglected and underutilized species in Africa*

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Background and objectives: Neglected and underutilized species (NUS) have the potential to contribute to healthy and sustainable diets. Several African-focused initiatives and projects recognize the potential contribution of NUS for improved nutrition and food security for African communities; however, limited knowledge of their composition hinders their promotion in such strategies. Identifying gaps in food composition data is a crucial step in addressing this issue and supporting the integration of NUS into sustainable food systems. The present work aims to identify gaps in food composition data for NUS from Africa to compile a list of priority foods for future analysis.

Methods: Independent compilation processes were conducted under two different initiatives at the Food and Agriculture Organization of the United Nations (FAO). A search for compositional data was performed for 131 plant-based foods classified as neglected or underutilized in Africa. Both common and scientific names were used to identify available data in three African FCTs and ten FCTs from countries and regions outside Africa. Only data for raw foods were included, covering a range of processing forms, parts, varieties, or cultivars of a given food (e.g. grain, flour, leaves, root, etc) when available. Data for energy, proximal composition (water, ash, protein/nitrogen, fat, fibre, carbohydrate), iron, zinc, calcium, vitamin A and folate were collated and harmonized according to FAO/INFOODS standards and guidelines.

Results: Food composition data were available for 94 foods (72%) from at least one of the 13 consulted FCTs. Among these, data for 71 foods were available in African FCTs while the remaining foods were found only in FCTs from outside Africa. The final compiled dataset includes 112 food items based on the list neglected and underutilized species. Notably, for nearly one-third (37) of the foods no data were available in any of the consulted FCTs. Examples of the use of compositional data for NUS will be highlighted in the presentation.

Conclusions: Food composition data for NUS in Africa are still lacking, especially in published national and regional FCTs for Africa. Expanding food composition data for these foods is crucial to understand the contribution these foods can make to the diets of African communities, and ensure they are considered in sustainable food systems transformation. The list of NUS with missing data generated in this study may serve as a valuable resource for researchers aiming to fill these critical data gaps.

Keywords: food Composition, neglected and underutilized species, biodiversity, Africa

(P2.173) *Enhancing food composition data utilization: the importance of food composition data accessibility*

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Background and objectives: Food composition data is a key resource in dietary assessment. It enables the calculation of energy and nutrient content of foods and drinks consumed in dietary surveys and the estimation of nutrient adequacy of diets. The availability of accessible, good quality, up-to-date, and relevant country/regional food composition tables (FCTs) including foods and components of interest are critical. Many FCTs exist only in pdf or web format, making their data integration into own management systems and thus use of the data challenging. Data utilization could be enhanced by ensuring accessibility of FCTs in spreadsheet format that supports data handling by users, including sufficient documentation on foods, components and nutrient values.

Methods: As part of another project, 11 national FCTs and three regional/global FCTs were selected based on their availability in an accessible format and on the quality score obtained through the screening questions in the FAO/INFOODS Evaluation framework. The selected FCTs were formatted using a common template. FAO/INFOODS component identifiers (tagnames) were used to identify the components for data interchange and calculated components (e.g. energy) were standardized.

Results: A single Excel spreadsheet containing a total of 22,241 food entries and 69 components from the 14 selected FCTs was obtained. The dataset primarily served to develop the Global Nutrient Conversion Table for FAO Supply Utilization Accounts. The dataset was also used to gain efficiencies in the matching of food consumption data to food composition data, including for surveys from India and Nigeria. The standardization and detailed documentation facilitated food composition data utilization. The Excel spreadsheet format is easy to search, identify and compare food composition data from different countries and regions. This dataset facilitates high-quality matching considering the availability of data from FCTs. Moreover, it reduces the risk of introducing random errors during data handling.

Conclusions: Dissemination of food composition data in an accessible format enhances data usability and link with dietary survey data. Data compilers should be encouraged to disseminate FCTs in accessible and user-friendly formats.

Keywords: dietary assessment, food composition tables, data accessibility, food matching

(P2.175) *Latest and ongoing updates of the food composition database for epidemiological studies in Italy (BDA): efforts to ensure a comprehensive and reliable tool*

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Background and objectives: The Food Composition Database (FCDB) for Epidemiological Studies in Italy (BDA, https://bda.ieo.it/) was first published in 1998 to support research in nutritional epidemiology. Given the continuous evolution of food supply and dietary habits, periodic updates are essential to ensure scientific accuracy and relevance. This work presents the most recent database update, which focused on Cereals and Cereal Products [1], together with the ongoing revision of Vegetables and plant-based foods group. We aim to expand the latter group, particularly including a greater number of plant-based manufactured products that are commonly found in supermarkets.

Methods: The BDA is a compiled database that integrates data from pre-existing sources. Priority is given to Italian published data [2] followed by foreign food composition databases and scientific articles. When no data is available, a recipe approach [3] is applied, based on nutritional values and ingredient lists from food labels. The BDA compilation process was reviewed and certified by EuroFIR (https://www.eurofir.org/) in 2012, ensuring compliance with rigorous standards that guarantee the quality and reliability of food composition data.

Results: The BDA currently includes 1109 food items. Thanks to the latest update focused on Cereal and cereal products food group, BDA now provides information on 89 components for a total of 278 items, of which 137 (49%) were newly added, representing foods commonly consumed in Italy. Regarding data sources, approximately 43% of nutritional values were derived from the Italian FCDB, 34% from international FCBDs, and few from scientific articles. Additionally, about 22% of data was obtained through calculation, recipes and nutritional labels. Despite efforts to ensure data completeness, missing values increased and in the whole dataset are now 7%. Regarding the ongoing update, 175 food items previously included in Vegetables and plant-based foods group are under revision to expand the coverage of food components. Moreover, the number of included foods is being extended to include cooked vegetables (e.g., boiled), and plant-based protein-rich products (e.g., meat substitutes).

Conclusions: The BDA project aims to offer a comprehensive and inclusive FCDB, covering a wide range of food items and components. The last update has been available online (https://bda.ieo.it/) since mid-2023, and the next update is scheduled for release in 2026. These updates will serve as valuable resources for epidemiological studies and will enhance the dietary nutritional assessment for both the general population and vegetarians/vegans.

Keywords: cereals and cereal products, plant-based products, food composition database, food consumption

(P2.185) *The creation and utilization of a global nutrient conversion table for the FAO supply utilization accounts*

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Background and objectives: High-quality food composition data are crucial to obtain adequate statistics for energy and nutrient availability. The Food and Agriculture Organization of the United Nations (FAO) publishes statistics for the Supply Utilization Accounts (SUA), which serve as the foundation for preparing the Food Balance Sheet (FBS). Until 2023, these statistics included energy and macronutrients (protein and fat) only, meaning that no statistics for vitamins or minerals were available. The SUA and FBS statistics are published on FAOSTAT, the largest global database offering free access to food, agriculture, fisheries, forestry, natural resources management and nutrition statistics. To develop a global set of energy, nutrient values and edible portion coefficients for the FAO SUA, and apply it to FAO's core work, including for nutrition, agriculture, fisheries, forestry, and trade statistics.

Methods: The screening questions from the new FAO/INFOODS Evaluation Framework were used to assess the quality of the potential FCTs for consideration. Documentation from the selected FCTs was carefully checked to identify the components, units, denominators and number of missing values for each component. The FAO/INFOODS component identifiers (also called tagnames) were assigned for a more precise component identification. The main criteria applied during the food matching was performed according to the FAO/INFOODS Guidelines for Food Matching.

Results: A total of 29 FCTs were assessed but only 13 were considered eligible for use in terms of quality for the food matching. After the component evaluation, 20 were considered for the first phase of the food matching including energy, edible portion, six minerals and four vitamins. Each SUA item was matched with food composition data from selected FCTs from different countries and regions. A quality score was assigned to each matching according to the FAO/INFOODS guidelines. The energy and nutrient values present an average profile for each food item listed in the SUA. The Global NCT for SUA consists of 435 food items for crops and livestock and 95 food items for fish and other aquatic products, totalling 530 items. The global table has been used to analyse statistics for nutrition, agriculture, fisheries, forestry, and trade statistics. Some key applications will be presented and discussed.

Conclusions: The systematic approach used for matching foods from the SUAs to food composition data facilitated the development of a single global FCT to assess food availability. This data has been utilized for multiple purposes of international significance in FAO's core work, demonstrating the importance of food composition data to the Organization.

Keywords: food matching, food Composition, FAO/INFOODS, supply utilization accounts, nutrient availability

(P3.87) *Micronutrient composition of rice-based non-instant breakfast meal fortified with date palm for school aged children*

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Background and objectives: Micronutrient deficiencies are a major public health concern in Nigeria and sub-Saharan Africa, particularly among children 0–5 years and school-aged children. Iron deficiency (anaemia) affects 40–60% of African children, impairing oxygen transport, immunity, and cognitive development. Zinc, vital for growth and immunity, contributes to over 450,000 child deaths annually. This study examines the micronutrient composition of a rice-based breakfast cereal fortified with nutrient-rich date palm. Two locally grown Nigerian rice varieties, Farmers' White and Abakaliki, were analysed for their nutritional contributions.

Methods: A mixed method design involving qualitative (product development) and quantitative (nutritional analysis) was used for this study. Farmers' White (AM) and Abakaliki rice (BM) varieties; date palm fruits (DP) were sourced from local farmers at Ifo in Ogun state, Nigeria. Rice was malted, dehulled and milled; date palm was cleaned, de-seeded and ground into powder; cereal formulation was based on FAO daily recommended intake (DRI) for school aged children. Micronutrient analysis (iron, calcium, magnesium, phosphorus, zinc) was carried out for the raw and final product using atomic absorption spectrophotometer. Proximate composition (moisture, protein, fat, fibre, ash and carbohydrate) was carried out using AOAC (Association of Official Analytical Chemists) methods. Data analysis was carried out using one-way Analysis of Variance (ANOVA) to compare the micronutrient of the two rice varieties. Significance level was judged at $p<0.05$.

Results: The micronutrient content (mg/100g) for AM, BM, and DP was as follows: iron (5.06, 5.32, 16.09), calcium (18.70, 19.19, 34.09), magnesium (97.31, 89.48, 78.54), phosphorus (142.78, 139.93, 52.64), and zinc (4.90, 4.99, 9.67), respectively. In the compounded cereals (AM+DP and BM+DP), the micronutrient levels were: iron (8.75, 7.52), calcium (24.70, 26.17), magnesium (143.81, 136.33), phosphorus (161.13, 148.53), and zinc (6.81, 5.38), respectively. The proximate composition (%) for AM, BM, AMDP, and BMDP was: moisture (5.72, 5.99, 6.18, 6.30), protein (19.09, 11.91, 8.84, 6.44), fat (3.74, 4.20, 1.99, 2.15), fibre (0.99, 1.26, 2.28, 2.38), ash (1.08, 1.02, 1.69, 1.25), and carbohydrate (69.34, 75.62, 79.01, 81.47), respectively.

Conclusions: Fortifying rice-based non-instant meals with date palm significantly increased micronutrient content, notably boosting iron by 41–73% and zinc by 9–39%, covering one-third of the DRI. However, reduced protein and fat levels in the compounded formulations may be due to the compounding ratio. Locally grown rice and natural fortification can enhance staple food nutrition.

Keywords: rice, meal, fortification, micronutrient, dates

(P3.88) *NutriBase: A FAIR-compliant system for interoperable food composition data and knowledge management*

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Background and objectives: Food composition data (FCD) and knowledge are essential for various research areas, stakeholders, and consumers. While FCD provides raw facts on food physiology, composition, and biochemistry, food-related knowledge involves understanding and applying this information. FCD and knowledge are compiled in multiple databases; however, they often lack integration and interoperability. Therefore, the aim is to develop a system that enables semi-automated linking of FCD while adhering to FAIR principles.

Methods: We developed NutriBase, a FAIR-compliant database management system integrating FCD from various sources with relevant knowledge. First, a fundamental database must be imported as a 'core database' and complemented with evidence-based data and knowledge from other resources. This web-based tool streamlines FCD handling and addresses challenges related to data harmonization, standardization, and missing data by enabling semi-automated data imputation.

Results: The result is a highly customizable system allowing the addition of newly generated data and localization for any country, as long as relevant data and metadata comply with well-established food standards and frameworks (e.g., CEN Food Standard, EuroFIR thesaurus). The feasibility of NutriBase was demonstrated using Slovenian FCD, which can be integrated with multiple foreign FCDBs and semantic resources. Due to its flexible design, we successfully expanded and localized the tool for English-speaking regions, with a pilot solution targeting Australia. Since Australian FCD and metadata are already harmonized and standardized, localizing the tool was relatively efficient. Currently, the Australian FCD can be supplemented with USDA data, as required by the research team. This system is invaluable for academia (for research and education), food producers (who can add and update branded food data directly within the tool), and policymakers (who can access accurate scientific evidence to inform public health strategies). Moreover, the tool serves as a central repository of trustworthy data and supports other digital platforms such as mobile apps and online grocery stores.

Conclusions: A key innovation of this system is its dynamic data and knowledge management capabilities, integrating diverse sources while maintaining FAIR principles and compliance with food standards. The tool ensures flexibility and scalability, evolving with scientific advancements, regulatory updates, and industry contributions. Its successful demonstration on Slovenian data validated its applicability, while its expansion to English-speaking regions further enhanced its reach. Unlike static databases, this system continuously adapts, ensuring the availability of high-quality food data and knowledge.

Keywords: food composition, food composition database, knowledge base, interoperability, data management

(P3.89) *Involving food industry in creating guidelines on how to provide nutrient data for the Norwegian Food Composition Database*

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Background and objectives: Analysis of the nutrient content of foods is considered as the gold standard in food composition data. However, analysing food is expensive, and compilers often have to calculate or borrow nutrient data from other sources. Nutrient data provided by the food industry is one source of borrowing data. Using industry data requires special quality assessments and strict requirements for the data provided. In Norway, several of the largest food industry companies have provided nutrient data for the food composition database for decades. In recent years, they have requested guidelines on how to deliver data. The aim of this work has been to involve the food industry in the development of guidelines for industry data in the Norwegian Food Composition Database (FCDB). The guidelines must be in line with the quality standards in food composition data, while at the same time making it possible for industry to provide data.

Methods: We prepared the first version of the guidelines in 2023. The version included general information about food composition databases, how to provide data (formats etc) and data requirements such as the number of nutrients. Several food industry companies questioned parts of the guidelines. In order to get a better grasp on their concerns, we involved them by hosting an open meeting with (1) information about food composition data and nutrient analysis, (2) presentation of the guidelines and (3) Q&A session. Afterwards, we sent the draft revised guidelines for consultation. We are now working on evaluating the responses from the consultation and to prepare a final version of the guidelines.

Results: Several representatives from the food industry have taken an interest in joining the open meeting and the consultation, including the main convenience chains, trade organisations and food industry companies. Their main concerns were: (1) branded foods versus generic foods, (2) the frequency of nutrient data update, (3) how to delete foods from the FCDB and (4) the use of FCDB data in dietary surveys and food intake/consumption statistics.

Conclusions: By involving the food industry in the process of developing guidelines, we have strived to be transparent and understand their needs in order to be able to provide nutrient data for the Norwegian FCDB. It is challenging to facilitate delivery of data from the food industry while maintaining the adequate quality requirements for a food composition database. Revised guidelines will be published in 2025.

Keywords: food composition data, food industry, nutrients, guidelines, data quality

(P3.94) *Improving nutrient intakes and climate resilience requires improved access to food composition data for opportunity crops*

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Background and objectives: Underutilized, under-researched, indigenous crops (AKA 'opportunity crops') can improve the biodiversity of ecosystems, increase adaptability to climate change, and improve nutrition. The Vision for Adapted Crops and Soils (VACS) was developed by the US State Department, FAO, and the African Union to promote these crops and to model their yields under varying emissions scenarios. We aimed to investigate the nutrient composition of 20 opportunity crops, and to provide recommendations to policymakers who are interested in scaling up production of these crops to diversify production systems.

Methods: We searched for the scientific name of each opportunity crop in publicly availably food composition tables on the FAO International Network of Food Data Systems (INFOODS) website (i.e., food composition tables (FCTs) where a link was available for download). Due to the inclusion of details such as species name and food form (e.g., cooked vs. raw), we ultimately used the West African and Bangladesh FCTs.

Results: We were able to obtain data for 15 of the 20 opportunity crops in the West African FCT. Teff was listed in the FCT for Africa, but the scientific name was missing, and we could not confirm whether the data was for the raw form. We expected to find nutrient values for teff in the Ethiopian FCT, since Ethiopia is the primary producer and consumer of this type of millet, but their FCT was not easily accessibly online. We were able to obtain the nutrient information for grass pea and mung bean from the Bangladesh FCT. We were unable to find data for finger millet and hyacinth bean/lablab.

Conclusions: Nutrient values for most of the VACS opportunity crops are available from the FAO INFOODS website; however, the data is not readily available in one searchable database. Practitioners may have trouble finding and downloading the FCTs or finding the correct nutrient information in the Excel files. Nevertheless, the food composition data will help determine which crops are suitable for scaling up production and for developing viable market links from growing regions to areas where corresponding nutrient intake gaps exist. Once policymakers have identified crops for scale-up and target growing regions, we recommend that nutrient analyses be performed using samples from those regions, as agro-ecological factors can impact the nutrient composition of crops. Additional data on different landraces of opportunity crops will strengthen country-level FCTs and future dietary intake analyses. In their current form, FCTs hold significant potential to aid in diversifying crop production, but more work is needed so that policymakers can more easily access accurate information.

Keywords: opportunity crops, biodiversity, food composition data, nutrient intakes, analytical data

(P3.96) *Underestimation of the total energy intake and intake of specific macronutrients and food groups without the use of yield factors in recipe calculation in FCDBs: data from the Serbian adults EU MENU Survey 2017-2022*

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Background and objectives: The updated Serbian Food Composition Database (FCDB) includes 1919 items, comprising 1103 foods and 816 common Serbian recipes (1). Accurate recipe calculations require yield factors (YFs) and retention factors (RFs) due to changes in weight and nutrient content during food preparation. In general, the lack of their incorporation leads to an underestimation of energy and macronutrient intakes and an overestimation of the micronutrient intakes. The European Food Information Resource (EuroFIR) recommends using YFs at the recipe level and RFs at the component level (2). A national dietary survey by the EFSA EU MENU methodology was conducted in Serbia in 2017-2022, involving adults aged 10-74, aiming to analyse individualized dietary data (3). By exploiting the data from this survey, this study aimed to compare estimated energy, macronutrients, and food groups intakes with and without applying YFs, highlighting the impact of YFs on individual energy intake estimates.

Methods: The valid data from 3036 participants (53.4% females) were collected, involving 1139 adults, 856 adolescents, 579 elderly people, 143 pregnant women, and 319 vegetarians. Two 24-hour recalls were employed to assess dietary intakes, and the advanced platform Diet Assess and Plan (DAP), integrated with the Serbian FCDB, was utilized for analysis (4,5). We analysed dietary data on total energy intake and energy intake from macronutrients and specific food groups with and without applying the YFs at the recipe levels. Participant-subgroup analyses were conducted to identify where differences were most/least pronounced. Results were presented as median (IQR) and Wilcoxon test's significance.

Results: Calculations without YFs yielded significantly lower energy, macronutrients, and all food group intakes ($p<0.001$), with a median energy underestimation of 223 (146-313) kcal, equating to a 10% (7-13%) shortfall. Fat intakes were the most affected, with an underestimation of 13% (10-16%), while protein and carbohydrates were underestimated by 10% (7-13%) and 7% (4-9%), respectively. The intakes of added fats/oils were the most underestimated, by 20% (16-23%), then of meat 15% (6-21%), vegetables 12% (7-18%), grains 8% (4-12%), eggs 10% (0-20%), and dairy 4% (0-10%), whereas of fruits, nuts/seeds, sweets, beverages, and alcohol were less impacted. The pattern was similar in all subgroups, except among vegetarians, who had lower shortfalls, with energy intake underestimated by only 6% (4-9%).

Conclusions: Omitting YFs leads to a 10% underestimation of energy intake, but the underestimation does not equally affect all macronutrients, food groups, or dietary patterns. Fat intakes were particularly affected, while vegetarian patterns were less impacted.

Keywords: yield factors, recipe calculation, dietary intakes, EU MENU survey, diet assessment tools

(P3.97) *Mexican Food Composition Database 2025: composition of frequently consumed foods in the country*

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Background and objectives: Mexico has historically relied on multiple food composition databases with varying information quality, highlighting the need for a unified national database. In 2019, the first version of the unified Mexican Food Composition database (BAM in Spanish) was launched by the National Institute of Public Health. However, the need for an update soon became evident, prompting the establishment of an inter-institutional collaborative effort. Therefore, this study aimed to expand the database by incorporating additional foods, recipes, and industrialized food products, as well as updating nutrient nutritional information.

Methods: The methodology of the 2025 BAM database is mixed, using both direct and indirect estimations of nutrient content. Energy estimations were updated following the criteria recommended by international organizations such as the Food & Agricultural Organization (FAO). Standardized recipes were updated using the mixed method, incorporating indirect yield factors.

Results: The 2025 BAM database includes data on 3,108 foods and recipes, covering a total of 28 nutrients, including energy. Of this information, 34.6% was indirectly estimated using standardized recipes, 17.25% was obtained through direct analysis, and the remaining data was indirectly sourced from various references: 23.36% from articles and other food composition databases, and 24.77% from food labels.

Conclusions: The 2025 unified Mexican Food Composition Database expands food coverage and improves nutrient estimations through a mixed-method approach. By integrating standardized recipes, direct analyses, and diverse database sources, it enhances accuracy and reliability. This freely available resource supports more precise dietary assessments and nutritional research in Mexico.

Keywords: food composition database, nutrient estimation, Mexican foods

(P3.102) *Evaluation of bioactive compounds in products developed from native Chilean berry (Aristotelia Chilensis (Mol.) Stuntz) with high antioxidant potential using two innovative technologies*

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Background and objectives: Maqui *(Aristotelia chilensis*) berry native to Chile known for its high antioxidant potential, anthocyanin content, and health properties. However, this berry is highly perishable and susceptible to microbial and enzymatic deterioration and oxidation during processing and/or storage. The objective was to evaluate the physicochemical properties and bioactive compounds in cryoconcentrate and microencapsulated maqui extracts.

Methods: Maqui berries were conditioned and subjected to aqueous extraction by shaking in a 1:1 w/v ratio, obtaining aqueous extract (E), separated into two batches; the first one was cryoconcentrated (C) in cryoconcentration devices (invention patent Bastías et al., 2018) using centrifugation-filtration as an assisted technique (Vidal-San Martín et al., 2021). The second batch of E was microencapsulated using the methodology proposed by Bastías-Montes et al. (2019), thus obtaining the microencapsulate (M). The physicochemical properties determined were water activity (aw), colour (CIELab), soluble solids (°Brix), and fibre, as well as the content of bioactive compounds such as total polyphenols (TP) (mg GAE/ 100 g or mL), total anthocyanins (TA) (mg cyanidin 3-glucoside / g or mL) and antioxidant capacity (AOXC) DPPH method (mg TE / 100 g or mL).

Results: C presented intense purple coloration with low a* and b* coordinates; aw was 0.984, both lower than E, probably due to the significant increase in soluble solids ~5.1 times higher. Fibre content was 0.103 g / 100g, lower than E (0.107 g / 100g), which could be due to the natural filtration effect of ice in the centrifugation process. Finally, C significantly increased the content of bioactive compounds compared to E, where TP increased by 280%, TA by 573% and AOXC by 226%. The M presented a purple coloration characteristic of the raw material but less intense and with CIELab coordinates that tended to a more luminous powder (L*). The law (0.15) showed a low product moisture and a reduced fibre content (0.100g / 100g). Finally, bioactive compounds increased significantly compared to E, increasing TP by 400%, TA by 383%, and AOXC by 893%.

Conclusions: Cryoconcentration and microencapsulation offer promising solutions for the food industry. They allow the concentration and preservation of thermosensitive compounds beneficial to health, such as polyphenols and anthocyanins in maqui.

Keywords: maqui, total polyphenols, total anthocyanins, antioxidant capacity

(P3.103) *Impact of heat treatment on antioxidant and cholinesterase inhibitory activities of some Nigerian plants (Curcuma longa, Piper guineensis, and Carpolobia lutea)*

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Background and objectives: Food processing, particularly heat treatment like steaming, significantly affects the quality, safety, and bioactive properties of plant-based food products. This study investigates the impact of steaming on the antioxidant and cholinesterase inhibitory activities of three Nigerian plants: turmeric (*Curcuma longa*), West African black pepper (*Piper guineensis*), and cattle stick (*Carpolobia lutea*). Turmeric, rich in curcuminoids, is valued for its anti-inflammatory, antioxidant, and anti-neurodegenerative properties. *P. guineensis*, containing piperine, offers thermoregulatory and antimicrobial benefits, while *C. lutea*, known for aphrodisiac effects, exhibits antioxidant and sexual health benefits due to compounds like flavonoids and phenols.

Methods: Fresh samples were steamed for 5 minutes and oven-dried at 60°C, compared to raw oven-dried controls. Antioxidant activities were assessed via DPPH, ABTS, and FRAP assays, and cholinesterase inhibition (AChE and BChE) was measured colorimetrically.

Results: Results showed steaming enhanced turmeric's DPPH (5.83% to 52.21%) and ABTS (0.00013 to 0.00028) activities and cholinesterase inhibition (AChE: 18.71% to 38.89%; BChE: 8.46% to 28.64%), likely due to increased curcuminoid bioavailability. Conversely, *P. guineensis* exhibited reduced DPPH (40.56% to 13.52%) and ABTS (0.00066 to 0.00048) activities and cholinesterase inhibition (AChE: 32.46% to 23.98%; BChE: 22.21% to 13.73%), though FRAP increased (18.64% to 19.62%), possibly due to heat-sensitive compound degradation. *C. lutea* showed a slight DPPH decrease (26.22% to 16.55%) and reduced cholinesterase inhibition (AChE: 36.55% to 20.76%; BChE: 26.30% to 10.51%), with minor ABTS and FRAP increases, reflecting mixed responses to heat.

Conclusions: These findings highlight steaming's variable effects—enhancing turmeric's bioactivity while diminishing that of *P. guineensis* and *C. lutea*—underscoring the need for tailored processing to optimize their therapeutic potential for oxidative stress and neurodegenerative conditions.

Keywords: heat treatment, steaming, antioxidant, acetylcholine esterase, butyryl choline esterase

(P3.104) *Variations in the dietary fibre composition of staples made from popular cassava and yam varieties in Nigeria*

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Background and objectives: In sub-Saharan Africa, cassava and yam are common staples that, despite their high glycaemic index, contribute substantially to dietary fibre intake particularly when combined with other fibre-rich foods. It is unclear and mostly unknown if common varieties (and their corresponding products) have different dietary fibre composition. This study was designed to evaluate total, soluble and insoluble dietary fibre of commonly consumed cassava and yam-based foods from selected varieties of cassava and yam.

Methods: Ten varieties of cassava (*Manihot esculenta*) and Yam (*Dioscorea rotundata*) popularly adopted among Nigeria farmers were cultivated uniformly and harvested for processing at the International Institute of Tropical Agriculture, Nigeria. The cassava varieties were TMS 4(2)1425, TMS 011412, TMS 980505, TMS 980581, TMS 1011368, TMS 30555, TME 419, TMS 30572, TMS 011371, TMS 8002. The yam varieties were Lasinrin, Efuru, Dariboko, Meccakusa, TDr/02665, Alumaco, Oju Iyawo, TDr 89/02475, TDr 95/19158, Amula. Four products were produced from fresh roots of cassava (Eba, Fufu, Gari and Lafun) and raw tubers of yam (Boiled yam, Fried yam, Amala and pounded yam). Standard laboratory method for dietary fibre analysis was used. Mean ± SD was used to describe the data. ANOVA test was applied to evaluate for differences among varieties.

Results: The composition (%) of total and soluble dietary fibre, respectively was found to range in Raw Cassava (1.73% – 2.92%, 0.38% – 0.66%), Gari (3.17- 5.34, 0.90 – 1.55), Eba (0.95 – 3.18, 0.14 – 0.32), Fufu (1.31 – 2.77, 0.18 – 0.40), Lafun (1.6 – 2.81, 0.06 – 0.12). In Yam, the values ranged in Raw Yam (2.65 – 5.21, 0.28 – 1.00), Boiled Yam (2.34- 4.25, 0.82 – 1.49), Amala (1.11 – 4.05, 0.82 – 1.59), Fried Yam (1.43 – 3.92, 0.64 – 1.58), Pounded Yam (2.36 – 4.46, 0.04 – 1.56). Overall, there were statistical differences ($p<0.05$) when total dietary fibre was compared across varieties especially in comparison with existing values from regional and national food composition tables. These differences were less substantial with the soluble fractions of dietary fibre within varieties and among products.

Conclusions: The differences in fibre composition highlight an opportunity for updating national food composition databases. The data also adds value to nutrition and food technology applications that are focused on value addition and health promotion. Long term impact of consuming different products with higher dietary fibre composition on nutritional epidemiology is recommended.

Keywords: dietary fibre, cassava, yam, variations, soluble dietary fibre

(P3.105) *Survey experiment to improve data collection and estimation of food consumption away from home in Samoa*

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Background and objectives: Food acquired and consumed away from home (FAFH) is an increasingly significant source of nutrition globally. In lieu of nationally representative dietary intake surveys, data from household consumption and expenditure surveys (HCES) are commonly used to approximate dietary energy consumption (DEC) in a population. As diets transition, HCES methods have evolved and, in 2018, FAO and World Bank recommended FAFH consumption data be collected via an individually administered 7-day consumption expenditure recall module. Applications of HCES data in monetary poverty and nutrition assessment require estimation of food consumption in kilocalories. Estimating DEC 'at home' is simple as quantity data are collected, however the estimation of FAFH DEC is problematic as quantity data are not. To estimate FAFH DEC, survey statisticians use the cost of one kilocalorie consumed 'at home', often with an arbitrary multiplier of 1.25 or 1.5 to account for non-food costs associated with FAFH consumption. To directly measure the FAFH calorie cost, our survey experiment, implemented in Samoa, collected FAFH consumption quantity data.

Methods: We established a sampling frame of FAFH meals consumed in Samoa using web-search, crowdsourcing, expert group consultation, extraction of data from previous HCES, and physical enumeration of food vendors. For each identified meal, nutrient composition data were collected using indirect methods, including: i. physical preparation of the meal; ii. purchase and weighing each individual meal element; and iii. extracting nutrient composition data from existing food composition tables. A 'Manual of Food Portion Quantification' (MFPQ) with photographs of different meal portions and a chapter of commonly used food serving units, such as spoons, cups and plates, was developed for use during data collection. The MFPQ included food composition data for each meal portion. The survey experiment, inclusive of 420 households (HHs), was implemented concurrently with the national HCES (n=3,074 HHs) which adopted the FAO and World Bank recommended survey module to collect FAFH consumption data. The experimental arm utilised an individually administered 7-day diary which collected FAFH consumption quantity data referencing the MFPQ.

Results: After controlling for socioeconomic characteristics of the household, the cost of one FAFH kilocalorie was 2.25 times higher than one consumed 'at home'. Estimates of the prevalence of undernourishment (PoU) were doubled when using the experiment-derived multiplier rather than 1.25 (12,637 undernourished persons against 6,463).

Conclusions: Kilocalories consumed 'at home' cost less than those sourced away from home. Assumptions used when estimating DEC sourced from FAFH have significant implication on the estimation of the PoU.

Keywords: food away from home, survey method, food composition, poverty, food security

(P3.109) *Development of Australian food composition reference and labelling datasets*

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Background and objectives: Food Standards Australia New Zealand (FSANZ) maintains and updates the Australian Food Composition Database (AFCD) and an online labelling the tool, the Nutrition Panel Calculator (NPC). Updated versions of AFCD and the dataset that supports the NPC will be published in 2025.

Methods: The AFCD contains primarily high quality Australian derived analytical data for foods which are key to the Australian diet or common ingredients in other foods. These data are generated through analyses commissioned by FSANZ, or through collaborations with academic and industry research partners. Where analytical data is not available, FSANZ follows established food composition processes to generate the data such as recipe calculations, imputation, use of label information and borrowing from overseas food composition tables, where appropriate. The NPC dataset is based largely on the AFCD dataset. The food list is customised by adding ingredient-style foods of relevance to the food manufacturing process, and by excluding foods which are not often added to other foods such as cakes. The nutrient list is also reduced to include the seven mandatory components required in a nutrition information panel.

Results: The AFCD contains primarily analytical data for around 1,600 foods and up to 256 nutrients per food, while the NPC dataset contains around 2,500 foods. Both the AFCD and the NPC are freely available on the FSANZ website in online interactive formats and as downloadable database files.

Conclusions: Up to date data on the nutrient content of Australian foods is available for use by regulatory government agencies, nutrition researchers, the food industry, dietitians and students.

Keywords: Australia, reference database, food composition database, labelling

(P3.113) *Updated of Indonesian Food Composition Databases: application for sustainable healthy diets*

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Background and objectives: Nowadays, some countries have their national Food Composition Databases, whose continuous updating allows the inclusion of a large number of foods, reflecting the food habits of the population and the growing number of foods on the market in the best way possible. The food composition database can be used to manage the supply and demand of agricultural products, formulate nutrition improvement strategies, promote dietary management, and boost the food industry. All food and nutrition programs require information on the nutrient and non-nutrient composition of natural and processed foods. Currently, the food data listed in the IFCD still has several shortcomings. The objective of the project is to preserve the sustainable healthy diets by updating Indonesian food composition database.

Methods: The project used 97 agriculture commodities were determined through a baseline survey, then sampling and analysis were carried out. Systematic guidelines are a critical stage for preparing FCD, starting from sample selection to sample analysis to obtaining a valid database. Analyse the nutritional components of food including proximate (moisture, ash, protein, fat, and carbohydrates), dietary fibre, β-carotene, amino acids, vitamins (A, B1, B2, B3, and C), folic acid (B9), and minerals (Fe, P, Ca, Na, K, Cu, and Zn).

Results: Development of a sample information database on 97 agricultural items and food products data has been produced. It's consists of crops, starchy root, meats, eggs, vegetables, mushrooms, fruits, dairy products, and pulses. The collection information includes region or location, sampling date, varieties, photo (whole, edible part/non-edible part), pre-treatment method, etc. The data obtained can be used to update existing data in the IFCD, since this activity analyses food commodities that have not been listed in the IFCD or commodities that have been developed by the IAARD. it is essential for a variety of purposes in many different fields of work, such as the assessment of nutrient intakes to assess the effect of diet on health and disease and to support the development of dietary guidelines for population groups.

Conclusions: Nutrient analysis has been carried out on ninety-seven single fresh commodities and process food to enrich the database of nutritional components of foodstuffs. Data on the nutritional value of food in this study was obtained from the results of direct laboratory analysis (direct methods). The ninety-seven commodities analysed were different kind of crops, starchy root, meats, eggs, vegetables, mushrooms, fruits, dairy products, and pulses.

Keywords: agricultural commodity, food analysis, food composition database, healthy diets, nutrition

(P3.117) *Technologies for micro/nanoplastics and bioplastics research in food: insights from the FHERITALE project*

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Background and objectives: The increasing prevalence of micro/nanoplastics (MNPs) and the accelerated adoption of bioplastics in food systems pose substantial risks to public health, ecosystems, and environmental sustainability. FHERITALE project addresses these urgent challenges by fostering collaboration among European research infrastructures. This initiative aligns closely with the EU Commission's goals to bridge current knowledge gaps and improve regulatory frameworks regarding MNPs. The ultimate goal of FHERITALE is to establish a robust and harmonized research framework focused on building a collaborative network to advance knowledge, improve monitoring, and devise mitigation strategies for MNPs and bioplastics' impacts on food, health, and the environment. A key step to achieve this is the systematic identification, categorization, and mapping of existing technologies and analytical methods utilized in the study of MNPs and bioplastics, as well as the assessment of technological gaps and needs for these materials in the field of food, health, and environment.

Methods: The development of the comprehensive inventory was conducted through a systematic methodology. Initially, an extensive survey addressed to related EU service was deployed to capture prevailing practices, technological applications, and methodological approaches in MNPs and bioplastics research. This primary data collection was supplemented by a desk-based review of peer-reviewed scientific literature, and project reports, official documents and publications from the CUSP cluster of projects and other EU projects such as COST Actions PRIORITY and ICPlastic.3. Subsequently, SciSpace 4, an AI-powered literature analysis tool, was employed to efficiently manage and analyse extensive literature data. Optimized queries specifically targeting technologies and technological needs, coupled with quality controls and checks for ensuring soundness, facilitated accurate data extraction from SciSpace.

Results: The detected technologies and technological needs have been structured into a live repository, enabling stakeholders to monitor technological advancements. The inventory identifies emerging technologies with applications in MNPs and bioplastics research. The resulting inventory includes hundreds of technologies, which were grouped into the categories defined by FHERITALE’s survey and expanded to encompass emerging detection techniques, characterization methods, and innovative mitigation strategies applicable to MNPs and bioplastics research.

Keywords: microplastics, nanoplastics, technology, analytical method, research infrastructure

(P3.119) *Digital tools for recipe-based calculation of nutritional values: MenuLabel and NutraLabel applications for food and catering services*

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Background and objectives: Nutrition labelling plays a critical role in supporting informed dietary choices and ensuring regulatory compliance within the food industry. While mandatory for pre-packaged foods, there is an increasing demand for transparent nutritional information in restaurants and catering services, driven by rising consumer awareness and dietary requirements (1). To address these needs, MenuLabel and NutraLabel—cloud-based digital tools—were developed to automate the calculation of nutrient content in composite dishes and processed foods, facilitating accurate nutrition labelling and dietary management. MenuLabel is tailored for restaurants and catering services, whereas NutraLabel targets food producers managing complex, multi-ingredient products.

Methods: Both applications utilize standardized food composition databases, compliant with EuroFIR™ and national standards (2), integrated into the platform Diet Assess and Plan (3) which embeds algorithms to compute energy, macronutrients, micronutrients, portion-specific values from recipes and express them against DRVs. Nutritional estimations are adjusted for cooking and processing using established yield and retention factors (4). MenuLabel generates nutritional information list, enabling real-time consumer access to detailed nutritional profiles, while NutraLabel automates the generation of legally compliant labels in accordance with EU Regulation No 1169/2011 and national nutrition labelling regulations for complex packaged foods. Both apps calculate NutriScore based on nutritional values and provide unique QR codes to consumers for quick access to results. The tools were validated through comparative laboratory analysis of selected food products.

Results: MenuLabel enables dynamic and cumulative meal tracking via mobile devices offering nutrient breakdown, display of nutritional information per 100g and portion size, ingredient and allergen content and NutriScore. NutraLabel facilitates precise, regulation-compliant labeling for packaged foods, achieving high accuracy (mean deviation <5% from laboratory analyses). Both tools significantly reduce time, labour, and cost of laboratory analysis, while providing reliable and verified nutritional calculations, while promoting portion standardization and operational transparency.

Conclusions: MenuLabel and NutraLabel offer innovative, scalable solutions for recipe-based nutrition analysis and labelling across the food sector. By integrating standardized databases with automated adjustments for recipe calculation, these tools advance public health objectives by providing consumers with transparent information, and support food industry compliance with regulatory mandates.

Keywords: nutrition labelling, recipe calculation, digital dietary tools, food composition databases

(P3.124) *Quantifying and evaluating animal protein food intake in South Africa as a developing country case study within dietary guidelines and the meat reduction debate*

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Background and objectives: Global pressure to reduce meat intake, especially in developed countries, has been motivated by considerations such as environmental sustainability and health concerns. In contrast to developed countries, developing countries (like South Africa (SA)) often face more challenging economic conditions and socio-economic variability, impacting on food intake patterns. The analysis of food intake in developing countries is however hindered by a lack of regularly published, nationally representative and socio-economically disaggregated food intake data. The study objectives are: (1) To estimate the intake quantities of dominant protein foods (chicken, beef, pork, sheep meat, fish, eggs and legumes) in SA over time and across the socio-economic spectrum; (2) To evaluate the results against SA food-based dietary guidelines (FBDG).

Methods: In the absence of nationally representative food consumption data for SA, the estimation of lean meat intake departed from national aggregate (carcass mass) data on commodity quantities allocated to human consumption, reworked by applying carcass and food composition data for SA, as well as cooking yield factors. Socio-economically disaggregated lean meat and legume intake was estimated from official South Africa nationally representative household-level food expenditure data.

Results: In 2024, the intake of protein foods was dominated by chicken (36% contribution), beef (21%) and eggs (18%), followed by fish and pork - a very different intake pattern than pork-dominated Europe and Asia. Over the last decade the total national consumption of these foods increased in SA, even though the intake per capita declined for beef, chicken, and eggs. In 2024, the average daily per capita cooked lean meat intake was estimated to be 64g per day (below the SA FBDG value of 90g). The meat intake of at least 80% of the SA population falls below this level – limiting the intake of critical micro-nutrients such as iron and zinc for these lower-income individuals. Affordability of meat choices within consumption dynamics will also be discussed and interpreted.

Conclusions: In contrast to developed nations, the below-recommended intake of meat in SA raises some controversy in terms of the contribution of animal protein foods to overweight / obesity - emphasising the importance of accurate and regularly updated country-specific food intake and compositional data. The importance of accurate conversion factors (i.e. accounting for skin, fat, bone, and cooking losses) should also be recognised. The study applied a methodology to help bridge the data gap created by infrequent nationally representative food intake studies, providing data to inform the meat reduction debate in SA from a nutritional perspective.

Keywords: meat consumption, South Africa, dietary guidelines, meat reduction, SDG3

(P3.133) *Closing nutrient data gaps to unlock aquatic foods for sustainable nutrition*

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Background and objectives: Shifting towards a sustainable food system is necessary to reduce the climate impact of food production while still ensuring a nutritious diet. Aquatic foods have emerged as a promising solution; however, their diversity introduces variations influenced by geography and culture. While increased data availability enables broader research, it also presents challenges in ensuring appropriate application and interpretation, which vary depending on the research question, purpose, and scale. In this study, we summarize available databases, the types of data they contain, and their optimal applications based on specific uses.

Methods: We reviewed seven publicly available databases with varying geographic and species coverage on the nutrient composition of aquatic foods;the AnFood/BioFoodComp and uFiSh (FAO/INFOODS), FoodEXplorer (EuroFIR AISBL), FishNutrients (FishBase), SeaFood Data (Institute of Marine Research, Norway), and the Aquatic Food Composition Database (AFCD, Harvard). For 11 nutrients we examined the geographic coverage of empirical samples for each database using taxa reported in global aquatic food production data for 2022. To showcase differences among databases, as examples, we also compared the variability in protein, the n-3 fatty acids EPA+DHA, calcium, iodine, and, vitamin A and B12 in fillet samples of the widely consumed species Sardinella aurita (round sardinella), Salmo Salar (Atlantic salmon), Penaeus vannamei (whiteleg shrimp), Mytilus edulis (blue mussel), and Gadus morhua (Atlantic cod).

Results: Preliminary results from AnFood/BioFoodComp, uFiSh and the AFCD show high variability in geographical coverage across nutrients and databases. The AFCD had the greatest taxonomic coverage across all nutrients (from 25% for vitamin D to 67% for calcium and zinc), followed by AnFood/BioFoodComp (from 5% for folate to 34% for protein) and uFiSh (8% across nutrients). For the species and samples selected, the greatest variations in nutrient composition were observed in EPA+DHA (salmon), iodine (salmon, blue mussel, and cod), and vitamin B12 (blue mussel), while protein exhibit very little variation among taxa. While variations in vitamin A levels were present, only blue mussel contained amounts approaching 15% of the recommended intake.

Conclusions: Nutrient data gaps limit the ability for the global community to effectively leverage aquatic foods for nutrition. These findings can guide professionals to select appropriate databases and nutrients for chemical analysis, particularly in underrepresented regions, to improve the accuracy and applicability of dietary and environmental studies on aquatic foods.

Keywords: food composition, fish, seafood, shellfish, database

(P3.134) *Compiling a food composition database to support dietary studies in Bhutan using the INDDEX24 application*

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Background and objectives: Dietary assessment relies on food composition databases (FCDB) to facilitate surveys and the calculation of nutrient intakes. Like several low- and middle-income countries, Bhutan lacks a comprehensive database that supports such assessments, constraining the advancement of nutrition research. Therefore, under the EATWELL project in Bhutan, we are compiling a FCDB that comprehensively includes the common foods and nutrients of concern. In this abstract, we aim to discuss the methods, challenges encountered, and decisions employed, highlighting how data and resource limitations are being addressed in this context.

Methods: This work adopts an indirect compilation approach, sourcing data from the newly released Bhutan FCDB (1st edition), and most recent composition data from India, China, and USDA. We are following the INFOODS guidelines and Intake guidance documents throughout the process. Additionally, we are data scraping from food labels to fill in nutrient data on packaged foods.

Results: The new database includes 425 foods and 23 nutrients as of 13 March 2025. It also features home recipes, packaged foods and drinks, descriptors/probes, and portion conversion factors for every food in the database. The number of foods will be updated further during the EATWELL project dietary survey (April-July 2025 tentatively). The FCDB will be made publicly accessible through the global food matters database, whereby it can also be pushed to INDDEX24 application for dietary surveys.

Conclusions: This database will contribute to reducing the pre-survey work for future dietary surveys and enable collective advancement of FCDB and nutrition research in Bhutan.

Keywords: food composition, compilation, dietary survey, portion size estimation, nutrient intake

(P3.135) *URUGUAYFOODS: Moving towards updating the national database for the transformation of food systems*

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Background and objectives: URUGUAYFOODS, the National Chapter of Uruguay, was reactivated in 2019 under the coordination of the School of Nutrition at the University of the Republic (EN-Udelar). Within this framework, the Latinfoods Portal Project was incorporated in 2021, and the Chapter's Statutes and Technical Committees were established in 2022. Connections have been formed with various Udelar services and other institutions, including technical and governmental organizations. URUGUAYFOODS has been declared of institutional interest by the EN Board of Directors. The main objective is to update the chemical composition data of Uruguayan foods to contribute to the systematization of information in a food composition database (BDCA).

Methods: The working methodology included training the URUGUAYFOODS team, conducting university teaching activities, coordinating, and collaborating with different organizations and countries within Latinfoods, disseminating information at scientific events, seeking national funding, and conducting surveys among nutrition and health professionals.

Results: Six publications have been presented at conferences, including: XIX Latin American Congress of Nutrition (2021); 42nd National Nutrient Data Bank Conference (2022); II AADYND Congress (2022); 7th National Congress of Analytical Chemistry (2022); SLAN Congress (2023); and ICNAB (2024). The abstracts from the SLAN Congress 2023 were published in the Archivos Latinoamericanos de Nutrición journal. Two training activities were carried out: workshop on "Fundamentals of Food Composition Data and Estimation of the Chemical Composition of Recipes Using Food Composition Databases" (2025); course on "Compilation and Sampling of Foods" (2023). Additionally, the team participated in courses and seminars offered by FAO/INFOODS (2021-2022) and supervised two undergraduate research projects in the bachelor's degree in nutrition (2022-2023). Three projects have been implemented to generate food composition data: (1) "Generation of Agro-Food Data in Uruguay" funded by FPTA (2023); (2) Project on nutritional values of beef cuts (INAC, 2023); and (3) Project on stable isotope-based techniques for food and health in Uruguay (INIA, MSP, 2022-2026).

Conclusions: URUGUAYFOODS is making progress in obtaining data on the composition of national foods by developing projects, establishing connections with public organizations, and training members of the national chapter. Food composition databases (BDCA) are valuable educational tools that raise awareness about food quality and its relationship with health, positively impacting the population and supporting the adaptation of food systems to future challenges.

Keywords: URUGUAYFOODS, food composition database, nutrition, collaboration

(P3.137) *Recovering and reintroducing ancestral Andean legumes from Jujuy (Argentina): Composition, antioxidant activity and popping properties*

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Background and objectives: Andean crops exhibit remarkable biodiversity, including ñuñas (nuñas or k'osko beans), considered ancestors of commercial bean varieties (*Phaseolus vulgaris*). In Jujuy (northwestern Argentina), their use is mostly ornamental due to their colourful seed coats. The Institute of Investigation and Technological Development of Family Agriculture (IPAF-INTA-NOA), recovered 10 ñuña genotypes from local small farmers, propagated and classified them based on morphology. This study aimed to study the nutritional composition, in vitro antioxidant activity and popping capacity, of the 10 recovered ñuñas genotype to revalorize, disseminate and promote their production by family producers, knowing their properties and possible applications.

Methods: The ñuñas were cultivated during October- March/April 2023/24 in INTA-IPAF-NOA experimental field (2,190 masl), Maimará, Jujuy. Proximate composition was assessed using AOAC methods, polyphenols (Folin-Ciocalteu method), anthocyanins (AOAC 2005.02), and in vitro antioxidant activity were analysed by Ferric ion reducing antioxidant power (ascorbic standard) and the DPPH radical scavenging assay methods. Popping yield, volume increase and first popping time were determined using an electric oven at 250ºC.

Results: Protein content in natural ñuñas ranged between 18–25%, similar to other Andean beans but lower than commercial kidney beans (22–32%); lipid content was also slightly lower (0.33–1.23% in ñuñas vs. 1.1–2.8% in commercial kidney beans). Ethanolic extracts showed varying radical scavenging activity (2.3–27% DPPH inhibition) and reducing power (105–226 µmol AA/g flour). Anthocyanin content ranged from 1.4 to 40.9 mg C3GE/100g flour. The dark purple ñuña exhibited the highest antioxidant activity, while a dark brown genotype had the highest anthocyanin content. However, no correlation was found between seed coat colour and antioxidant activity, contrary to findings in other legumes. All ñuña genotypes exhibited popping ability to varying degree. The highest popping yield (36%) was observed in a tricolor genotype, with a first popping time of 5.22 min and an expansion ratio of 3.25 mL. Studies on Peruvian ñuñas reported 90% popping yield and a first popping time of 2.47 min.

Conclusions: The popping property offers a promising processing method for ñuñas, avoiding soaking and facilitating increased consumption. These beans also present promising nutritional value due to their protein content and antioxidant compounds. As far as the author's knowledge, this is the first time these properties have been evaluated in these Argentine ñuñas genotypes, which would allow rediscovering these foods and rescue ancestral practices of production and food preparation.

Keywords: ñuñas, nutritional composition, anthocianins, antioxidant activity, popping properties

(P3.138) *Developing and testing nutrient profiles for alternative protein foods using branded food data and the scientific literature*

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Background and objectives: At the 43rd Session of the Codex Committee of Nutrition and Foods for Special Dietary Uses, a proposal for "Guidelines including General Principles for the Nutritional Composition of Foods and Beverages made from Plant-based and other Alternative Protein Sources" and scientific advice from the Food and Agriculture Organization (FAO) was requested.

Methods: The derivation of nutrient profiles for meat and dairy imitation foods and beverages was organized in a series of three tasks. 1) a review of the literature on the nutritional composition of existing alternative protein sources, 2) a review of the existing regulatory or scientific composition standards (nutrient profiles) for meat/dairy imitations and 3) the proposal of a set of nutrient targets, nutrient profile, for meat/dairy imitation products. A pilot branded food composition database for existing meat/dairy imitation products was created from open access food data sources, to test the feasibility of the proposed nutrient and test the performance of the proposed nutrient profiles on real-life data.

Results: The literature review identified 82,366 published reports, including n=45 reports on the nutritional composition of marketed alternative protein foods, n=58 reports on experimental foods and n=28 reports on the nutritive values of insects and insect- derived proteins. The most striking differences in composition were seen in plant-based dairy products as compared to their animal counterparts and mostly in cheese and milk imitations, which have significantly lower protein content than their animal-based counterparts. In the case of meat and fish imitations, the nutritional composition of imitations to their animal-based counterparts is comparable to a great extent. Examining regulatory and scientific standards across multiple regions, the report found a lack of specific nutrient profiles tailored to alternative proteins while two Front-of-Pack labelling schemes propose nutrient targets for plant-based foods. The importance of considering protein quality indices was highlighted in the regulation without a clear consensus across countries.

Conclusions: The proposed nutrient profiles include protein, sodium, total fat and micronutrient targets and so acceptable feasibility. Although the protein and micronutrient targets are the main and most immediate interest in setting nutrient profiles for such foods and beverages, consideration of their nutrient profiles in a more holistic manner is needed to address their shortcomings in sodium and fat content. Protein quality adjustments may be of interest in the regulation of alternative protein foods but no proposal was currently made towards it.

Keywords: plant-based foods, alternative protein sources, nutrient profiles, branded food composition data

(P3.139) *Research on the consumption and nutrition of dried meat in traditional method: the case of yak meat in Mongolian country*

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Background and objectives: In Mongolia, yak meat is considered to be just as delicious as beef from cattle. Yaks have been bred in the mountainous areas of the Himalayas, Tenger Mountain, Altai Khangai, and Khuvsgol since ancient times. Curing meat is a traditional method of preserving meat with a rich history across cultures around the world. Today, dried meat has become a popular food product in the market due to its long shelf life, taste, and health benefits. The purpose of the research is to conduct a study on the consumption and nutritional quality of dried yak meat and to integrate it into a unified food database to inform consumers about its importance and significance.

Methods: In our study, we prepared samples of traditionally dried yak meat from high mountain and forest-steppe regions according established standards. We then determined their general chemical parameters and fatty acid composition. The fatty acid composition was determined using the gas chromatographic method, identifying 37 essential fatty acids primarily found in dried meat.

Results: In this study, the average chemical composition of dried yak meat was moisture 6.7%, fat 11.46%, protein 78.2 %, calories 416.3 kcal, and ash 0.98%. After drying the meat, the protein content increased fourfold. A total of 25 fatty acids were identified in both raw and dried yak meat. Analysis of fatty acid content in all samples revealed 11 saturated fatty acids. The fat content in raw yak meat was 4.57% while in dried meat was 11.46%, respectively. As a result, SFA, and MUFA accounted for non-changes, PUFA accounted for 16.47%, and 16.15% respectively in raw meat and dried meat. In this result, the linoleic acid (LA) was 7.14% in raw meat, 6.17% in dried meat, and the a-linolenic acid (ALA) was 1.67 and 1.35% respectively.

Conclusions: One of the main features of this study is the introduction of a QR-based traceability system for dried meat labels, marking its first use in the market. Based on the study, the composition and content of fatty acids varied depending on regional characteristics, climate, climate change, and ecological factors.

Keywords: chemical composition, traditional method, traceability system, dried yak meat, food composition database

(P3.180) *Nutritional analysis of native foods from Los Altos and La Costa from Chiapas, Mexico*

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Background and objectives: Chiapas is grappling with a significant food access issue. Regions like Los Altos and La Costa from Chiapas are among the regions with high rates of food insecurity, despite having a third of the state's agricultural diversity. Organizations such as The Hunger Project-México are working to address this by recovering and promoting the use of traditional foods in rural Chiapas, to improve nutrition and rescue the region's gastronomic practices. The project aimed to analyse the nutritional composition of 13 native foods from Los Altos and La Costa from Chiapas to enhance their culinary use and preserve the region's gastronomic practices, ultimately improving nutrition.

Methods: Thirteen native foods from Los Altos y la Costa de Chiapas were selected and collected (turnip leaves, hierba mora, bledo, punta de chayote, quelite de mostaza, hoja santa, chipilín, chaya, tallo de hierba santa, Paterna inga spuria, jackfruit, tilapia fish and macus flower). The chemical analysis (moisture, ash, total carbohydrates, total dietary fibre, and ether extract), inorganic elements, vitamins, amino acid, fatty acid profiles, and total polyphenols of each food were carried out following the methodology of the Official Mexican Standards and the AOAC. All determinations were reported as the average of 3 measurements ± SD.

Results: The results obtained showed that, after fish, chipilín and punta de chayote were the vegetable sources with the highest protein content (24.34 g and 15.27 g/100 g, respectively). Paterna inga spuria and jackfruit were the foods with the highest fibre content (16.72 g and 10.85 g/100 g, respectively). Macus flower and chipilín were the sources with the highest phosphorus content (655.89 mg and 227.31 mg/100 g, respectively), magnesium (487.74 mg and 178.36 mg/100 g, respectively), calcium (336.65 mg and 692.8 mg/100 g, respectively), riboflavin (2 mg and 2.68 mg/100 g, respectively) and niacin (2.60 mg and 5.09 mg/100 g, respectively). Chipilín and hoja santa were the sources with the highest total polyphenol content (138.62 mg and 56.65 mg/100 g, respectively).

Conclusions: The data obtained demonstrated that vegetables consumed daily in the Los Altos and La Costa from Chiapas have an adequate nutritional value, in terms of protein, fibre, minerals, and vitamins, which can positively contribute to the health and well-being of rural populations. Identifying the amino acid profile of these sources will allow the establishment of optimal combinations of complementary proteins that meet the recommended daily intake for adults and children in conditions of food insecurity.

Keywords: nutrition, sustainable food, food insecurity, chiapas

(P4.39) *Exploring artificial intelligent models for sociocultural African food recognition system*

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Background and objectives: Artificial intelligence (AI) has significantly influenced food recognition systems and dietary decision-making. Noting limited research on African food recommendations, we developed an AI app to predict African foods and their nutritional components for sociocultural settings like birthdays and restaurants. This addresses the gap in information about African foods for people with various dietary needs due to health conditions, preferences, religious reasons, or restrictions. Our app recognizes foods from Nigeria, Ghana, and Cameroon, including Egusi, Ekwang, Eru, Jollof (both Ghanaian and Nigerian variants), Moi-moi, Ndole, Palm-nut soup, and Waakye. We collected 3,142 food images and nutritional data from YouTube videos with creative commons licenses and Kaggle.

Methods: We compared three deep learning models: inception-v3, plain CNN, and mobilenet-v2. The inception-v3 model achieved the highest accuracy (94.5% on test data) and was deployed in our app. To evaluate performance, we recruited 16 participants from Ghana, Nigeria, and Cameroon. After interviews, participants used the app for 7 days in real-world settings.

Results: The app recognized 71% of the food images generated by participants, outperforming human evaluators who recognized only 56%. Participants typically recognized foods from their own countries. Participants recommended design improvements for sociocultural food recognition systems, including expanding the range of African foods and enhancing nutritional information.

Conclusions: This research contributes to culturally-relevant AI applications for diverse dietary needs in African contexts.

Keywords: artificial intelligence, food recognition systems, dietary support, African foods, sociocultural

(P4.43) *FEIM webtool for safety assessment of food enzymes*

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Food enzymes are used for technical purposes in the production of food ingredients or foods-as-consumed. In the European Union, the safety of a food enzyme is evaluated by EFSA on the basis of a technical dossier provided by an applicant. Dietary exposure is an integral part of the risk assessment of food enzymes.

In July 2024, EFSA released the FEIM webtool designed to estimate chronic exposure to food enzymes through the diet. The FEIM webtool is freely accessible to anyone through the R4EU platform upon registration. FEIM follows the methodology recommended in the CEP Panel's Scientific Guidance for the submission of dossiers on food enzymes with input data curated according to the Guidance on food manufacturing processes and technical data used in the exposure assessment of food enzymes. The webtool can calculate cumulative exposure from multiple food manufacturing processes.

FEIM is the outcome of a long-standing effort started in 2016 with the launch of numerous calls for data on food enzyme-specific uses for various manufacturing processes. Such data was matched to FoodEx2 categories according to technical factors and assembled into a catalogue. By 2023 the catalogue contained 40 individual food manufacturing processes. By collating that data, 30 spreadsheet calculators were created (FEIM Calculators), combining the collected data with consumption data from the European Food Consumption Database. These calculators provided process-specific exposure results for different population groups (e.g., infants, toddlers, or adults) in different countries of the EU. The end users of FEIM are food enzyme manufacturers, risk assessors and risk managers. The results of the calculation also empower consumers with information on their dietary exposure to food enzymes.

Keywords: enzyme, food manufacturing process, conversion factor, calculator, FEIM

(P4.45) *Food composition databases: a tool for the design, implementation and monitoring of policies to improve food environments*

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Background and objectives: Unhealthy diets are one of the main risk factors for non-communicable diseases (NCDs) and obesity. Intake of nutrients whose excessive consumption is associated with increased risk of NCDs (fats, salt and sugars) are higher than recommended in most of the EU countries. Reducing the consumption of HFSS products would therefore contribute to tackle diet-related NCDs and obesity. In the Nutrition Observatory for Nutrition and the Obesity Study of Spanish Agency for Food Safety and Nutrition (AESAN) studies are conducted to design and evaluate public health initiatives. Moreover, the childhood obesity is monitored periodically. An extensive food nutritional composition study was carried out in 2022 to ascertain the options available to citizens in Spain and to focus public health initiatives to improving food environments.

Methods: Data were collected by KANTAR Worldpanel (TAYLOR NELSON SOFRES, S.A.U.). Labelling nutritional information and market share data were based on the purchases made by a panel of consumers, representative of the Spanish population. Information was collected for 29,577 products (85.7% market share in Spain in 2022). Products were classified into 20 categories and 94 subcategories, according to the WHO classification adapted to the Spanish context. For data analysis the statistical programme STATA V16 was used, with the collaboration of Orbistat Consultoria Estadistica SL.

Results: The highest number of products were in processed meat, poultry and fish (N=4,371); cake and biscuits (N=3,202); and prepared food (N=2,897). processed meat, poultry and fish showed higher market share (12.44 %), followed by fresh and frozen fruit, vegetables and pulses (8.52 %); and cakes and biscuits (7.61 %). The highest mean energy content was observed in butter and other fats and oils; salty snack; and chocolates and confectionery. All of these have an average energy content of > 500 Kcal/ 100 g. chocolate and confectionery; Ice cream; cakes and biscuits; and breakfast cereals showed mean sugar content >17 g/100 g. The mean saturated fat content was > 15 g/100 g in Butter and other fats and oils; Cheese; and Chocolates, and confectionery. For salt, mean content was ≥ 1.5 g/100 g in Prepared food; Processed meat, poultry and fish; Sauces and dressings; Cheese and Salty snacks.

Conclusions: Food composition databases are a relevant tool for many objectives in the field of public health and nutrition. Researchers, clinical practitioners, food industry, health authorities and citizens need reliable and up-to-date data, reflecting the variability of products available on the market to which consumers have access in their purchasing choices. New IT applications can help to disseminate data in a more friendly way.

Keywords: food composition database, public health policies, data dissemination

(P4.74) *Reporting on the phenolic content of commonly consumed South African foods compiled from high quality South African literature*

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Background and objectives: Researchers are continuously aiming to elucidate the health promoting benefits of polyphenols in the human diet. To translate dietary polyphenol intake into health benefits, the first step is estimation of polyphenol intake by using a polyphenol composition database. The aim of this research was to report on the characteristics of a recently developed South African Dietary Polyphenol Reference Database (SADPRD) and report on the polyphenol content of South African foods compiled from high quality appraised academic literature.

Methods: Polyphenol content data for various foods were obtained from systematically sourced South African literature, which also underwent literature and data quality assessment. The reference database was compiled from literature with a quality index score of 80% or higher. Data were compiled using Microsoft Excel© spreadsheets in a manner similar to the USDA Flavonoid database. Data fields included food code, polyphenol code, food item nomenclature, food group, polyphenol class, subclass, individual polyphenol, method of analysis, measurement unit, mean value, standard deviation, number of samples analysed, number of samples collected, minimum and maximum values, the literature reference, data quality index score and confidence code. FAO/INFOODS guidelines were employed for food nomenclature and data verification.

Results: The SADPRD comprises 237 food items, categorized into 8 food groups, and contains information on 8 polyphenol classes. The database includes 1002 polyphenol values, supported by 14454 data points. Furthermore, data obtained from 18 polyphenol quantification methods have been compiled. Across all food groups, the total phenolic content (TPC) values varied from 4 mg gallic acid equivalents (GAE)/100g in maize flour to 11 840 mg/100g in dried stinging nettle. Total anthocyanin content in fresh fruits and vegetables ranged from 0.8 to 41.1 mg cyanidin-3-glucoside equivalents (C3GE)/100g for tomato and pomegranate, respectively. Most foods containing individual polyphenols determined by chromatographic methods emanated from the vegetables group, whilst the food with the most polyphenols listed was fermented rooibos tea. The flavonols subclass was the most dominant, with myricetin and kaempferol being the most commonly reported polyphenols.

Conclusions: This database will be a valuable resource for researchers, clinicians, and food scientists who want to understand polyphenol intake and its potential health implications in South Africa. A standout feature of the SADPRD is that this database contains data of all polyphenols and is not limited to one class. Furthermore, all compiled data is quality assured, and traceable to their original publications.

Keywords: dietary polyphenol, data quality, phenolic content, reference database

(P4.84) *Enhancements of the Composition and Labelling Information System (CLAS) tools for efficient monitoring of the food supply in Slovenia*

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Background and objectives: Regular monitoring of food, including food supplements, is essential for assessing the composition and availability of processed foods - key contributors to diet-related non-communicable diseases. In Slovenia, systematic food monitoring began in 2011, and since 2015, all studies have used the standardized Composition and Labelling Information System (CLAS). In 2023, CLAS was enhanced to monitor specialty products, such as food supplements. This study aimed to analyse trends in the Slovenian food supply, focusing on changes in pre-packaged food availability in 2024.

Methods: A cross-sectional study collected branded food data in all major retail stores. To ensure food supplement collection, the 2024 monitoring was further extended to specialty stores and pharmacies. Labelling data were collected using CLAS, a standardized food monitoring infrastructure. The CLAS is more detailedly described elsewhere (Pravst et al., 2021) and used in various European countries. Researchers used the CLAS mobile app to scan barcodes and capture label images. Data were processed using an online CLAS tool with advanced IT solutions and manual verification. The study analysed food availability trends by comparing 2011, 2015, 2017, 2020, and 2024 datasets.

Results: The number of sampled food products has increased substantially over the years, reflecting both changes in the food supply and the inclusion of additional retailers and food categories. In the latest 2024 collection, 30,401 unique food items were recorded. The enhanced monitoring included 2,472 food supplements, compared to just 339 in 2020. The recent monitoring confirmed the trend of the high turnover of branded food products, which was observed in previous monitoring years (2011–2020) (Pravst et al., 2021). Out of the 6,348 products sampled in 2011, only 2,285 (−64%) were still available in 2015, 2,207 (−65%) in 2017, 1,526 (−76%) in 2020, and just 1,055 (−83%) remained in 2024. Additionally, of the 17,984 products first collected in 2020, only 6,059 (−66%) were still available in 2024. These findings confirm the dynamic nature of the food market and the rapid replacement of products over time.

Conclusions: Food monitoring studies in Slovenia demonstrate that the food supply is highly dynamic, with frequent product turnover. While some products have a long market-life, the majority are rapidly replaced. These findings highlight the importance of regular monitoring to maintain up-to-date food composition databases. Future efforts should explore mechanisms to facilitate open data sharing by food producers to improve data accessibility and public health research.

Keywords: branded food database, labelling, food monitoring, Slovenia, CLAS

(P4.85) *Utilizing food composition data to promote biodiversity and sustainable diets - insights from the Biovalue project*

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Background and objectives: Food composition data is essential for understanding the nutritional value of foods and their role in addressing global health challenges. The Biovalue project leverages comprehensive food composition data to evaluate the nutritional profiles of underutilized crops, landraces, and traditional food varieties. By linking biodiversity with nutrient-rich food systems, Biovalue aims to highlight the potential of diverse crops in improving human health and supporting sustainable agriculture.

Methods: This project employs detailed food composition analysis to assess the micronutrient and bioactive compound profiles of selected crops. Key parameters, including vitamins, minerals, antioxidants, and phytochemicals, are measured to create a comprehensive nutritional database. In addition, agronomic studies explore how crop diversity influences soil health and climate resilience, providing a holistic view of food systems that integrates both nutrition and environmental sustainability.

Results: Initial findings show that underutilized crops contain significant amounts of essential nutrients, such as vitamins, minerals, and antioxidants, which can play a key role in addressing micronutrient deficiencies. These crops also contribute to a more diverse and resilient agricultural system. Food composition data reveals that traditional varieties often offer superior nutritional profiles compared to widely grown commercial crops, reinforcing the importance of preserving biodiversity for nutritional and ecological benefits.

Conclusions: The Biovalue project demonstrates the importance of food composition data in assessing the nutritional potential of underutilized crops and fostering more sustainable food systems. Using diverse crop varieties, Biovalue offers new opportunities to improve human nutrition, combat deficiencies, and create resilient, sustainable agricultural practices. This project emphasizes the need for evidence-based policies that support the integration of biodiversity into food systems for better health outcomes and environmental sustainability.

Keywords: underutilized plants, biodiversity, food composition, nutrition, food security

(P4.143) *Automated monitoring of iodine content in food: a key component of Norway's iodine fortification program*

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Background and objectives: In 2016, the Norwegian National Council for Nutrition (NNCN) concluded that iodine intake was worryingly low in parts of the Norwegian population and recommended that national authorities take action. Ensuring adequate iodine intake for the population was included in the government's latest action plan for a healthier diet. Risk assessments were performed by the Norwegian Scientific Committee for Food and Environment. The Norwegian Food Safety Authority (NFSA), the Norwegian Directorate of Health and the Norwegian Institute of Public Health have jointly proposed an Iodine Fortification Program to be implemented in 2025. This program consists of three main components:(1) increased iodine fortification in selected food groups (voluntary) (2) monitoring program for both iodine status and health effects in the population, as well as iodine content in food products sold on the Norwegian market (3) communication plan to raise awareness and ensure proper guidance for both consumers and industry. This work presents NFSA's approach to the monitoring program.

Methods: The Iodine Fortification Program has a 10-year outlook. The monitoring efforts conducted by NFSA are based on two primary components: (1) market monitoring, this involves tracking changes in the market over the entire period, with a focus on voluntary fortification in bakery products, household salt, and other iodine-fortified food items; (2) product analysis, iodine content will be analysed in selected food items through three separate projects. NFSA is developing an automated monitoring system by integrating data from various sources. Specifically, a comprehensive product database is used, covering items sold and distributed across the grocery, kiosk, and catering sectors in Norway. This database includes essential product details such as ingredient lists, nutritional declarations, allergens, and more. It is linked with annual sales data at the product level using GTIN numbers, allowing us to track iodine-fortified products over time. A similar approach is applied to products sold in pharmacies, ensuring consistency across different distribution channels. Online commerce is also monitored using web scraping tools to track supply of food supplements. By integrating multiple datasets through this automated system, NFSA will be able to effectively monitor the Norwegian market for iodine content in food items and make timely adjustments to the program as necessary.

Results: The monitoring system is currently under development and a baseline will be implemented during the first quarter of this year. We will present this baseline as well as initial results from the full program set to be implemented from June.

Keywords: iodine, fortification, monitoring, food composition data

(P4.147) *Aligning food composition data with sustainability in food-based dietary guidelines: applications of a transdisciplinary and participatory food systems-based approach*

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Background and objectives: The current global industrialized food system is a major contributor to both malnutrition and global change. As a result, the inclusion of environmental sustainability has been increasingly included within national food-based dietary guidelines [ES-FBDGs].1 However, food composition data has not evolved in parallel to evaluate adherence to such ES-FBDGs. Since the early 21st century, local food systems worldwide have dramatically changed. Foods previously grown in areas are now imported, livestock and fish are raised in industrial confinement, and industrial agriculture has largely replaced the use of nutrient-rich native cultivars.2 Climate change also negatively impacts the micronutrient composition of foods.3 Without clear guidance for how to implement ES-FBDGs within local food systems and a clear agreement on how local food systems work, a transdisciplinary and participatory food systems-based approach is warranted. The primary objective of this analysis is to evaluate how such an approach can inform improvements in food composition databases to adequately evaluate adherence to ES-FBDGs.

Methods: In five climatically, agriculturally and culturally distinct regions of Chile, we employed a multisectoral food systems-based approach to collaborate with small-scale producers, vendors, and consumers to unravel the complexity of implementing the Chilean ES-FBDGs.4 In each region we conducted one meeting to adapt and implement food system assessment surveys (n = 32), and one group model building workshop centred around the ES-FBDGs (n = 32). We analysed the surveys and causal loop diagrams [CLDs] to identify key elements and clarify barriers and strengths to implement the 10 key messages in the Chilean ES-FBDGs.

Results: In each region, small-scale producers, vendors and consumers co-developed a CLD. From the CLDs, we identified key themes related to environmental sustainability that influence nutrient composition, such as a lack of available land for fruit/vegetable production for national consumption. Survey results indicated that top barriers to the uptake of ES-FBDGs are food imports of healthy foods (e.g., legumes); the presence and marketing of ultra-processed foods; climate change; and land use change for agricultural export. Local and indigenous foods in Chile were identified that have sociocultural relevance for both human and planetary health but are not included in food composition databases.

Conclusions: Integrating food systems-based approaches into implementation studies of ES-FBDGs is critical for informing related food composition data. This study underscores the potential of a participatory food systems-based approach in advancing the usability of food composition databases in accordance with ES-FBDGs.

Keywords: food-based dietary guidelines, environmental sustainability, food systems, group model building, Chile

(P4.149) *Decision-making on food composition matching as an engagement tool to promote understanding and use of micronutrient intake data for national policy*

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Background and objectives: Food composition data, when combined with household consumption and expenditure surveys (HCES), are critical for assessing nutrient intake and guiding food system interventions. The World Food Programme's Modelling and Mapping Risk of Inadequate Micronutrient Intake (MIMI) approach addresses micronutrient data gaps by using secondary data to estimate the risk of inadequate intake and model potential policy scenarios to mitigate elevated risk. Matching aggregated food items (e.g., 'other fruit') to nutrient values requires local knowledge and consensus to ensure accurate estimates. This study aims to assess the extent to which engaging diverse stakeholders in the process of matching food composition data to food consumption data from HCES improves modelled estimates of the risk of micronutrient intake inadequacy.

Methods: A collaborative, iterative approach engaged policy, program, and academic stakeholders in India, Bangladesh, and Sri Lanka. HCES data (NSS 2022-23 in India, HIES 2019 in Sri Lanka, and HIES 2022 in Bangladesh) were used to estimate apparent iron and folate intake inadequacy. Food items were first matched to nutrient values from local food composition tables by the MIMI team. Then, national stakeholders reviewed and refined these matches, with changes systematically recorded. Third, a leave-one-out (LOO) sensitivity analysis identified key contributors to iron and folate intake. Overlaps between stakeholder-identified and LOO-identified key foods were analysed to assess the impact of collaborative food matching.

Results: In India, 74 foods were identified for refinement through stakeholder review, and 15 were highlighted as key contributors to iron and folate intake through LOO analysis. The structured review process led to refinements in nutrient values for key foods, improving the accuracy of intake estimates. With these adjustments, 69% of households were at risk of inadequate iron intake and 44% for folate, with regional variations. The largest folate sources varied by state – cereals in Rajasthan and vegetables in Mizoram. The collaborative food matching approach improved the quality of HCES data for nutrition policy and research.

Conclusions: Generating evidence to fill critical knowledge gaps is essential, but its ultimate use and influence depends on processes through which it is produced and shared. We demonstrate how engaging stakeholders in food matching improves data accuracy and fosters evidence uptake for policy and programs. This adaptable approach can be applied in other countries, facing similar data gaps, to strengthen global micronutrient assessment and food system interventions.

Keywords: micronutrient intake, food matching, HCES, stakeholder engagement, evidence uptake

(P4.111) *AUSNUT 2023 – Development of the Australian Food Composition Database to support the 2023 National Nutrition and Physical Activity Study*

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Background and objectives: Food Standards Australia New Zealand (FSANZ) maintains and updates Australian Food Composition Databases. In May 2025, FSANZ will publish a survey specific database, AUSNUT 2023. AUSNUT 2023 contains all the data needed to turn information about the foods and dietary supplements reported in the 2023 National Nutrition and Physical Activity Study (NNPAS) into food, dietary supplement and nutrient intakes, and enable reporting against dietary guidelines.

Methods: FSANZ followed established food composition processes to generate high quality data for all foods consumed during the 2023 NNPAS for inclusion in AUSNUT 2023. The food nutrient database drew on current, high quality Australian derived analytical data from our reference database, the Australian Food Composition Database. This database was then expanded to include nutrient profiles for the additional foods reported in the NNPAS through the use of recipe calculations, imputation, label information and borrowing from overseas food composition tables where appropriate. Each food was classified according to two classification structures to support reporting of food and nutrient intakes and to enable comparisons with the Australian Dietary Guidelines. Foods were also classified as discretionary or non-discretionary. One or more measures were also assigned to each food to allow for the calculation of nutrient intakes.

Results: The AUSNUT 2023 dataset will be freely available on the FSANZ website and includes 15 data files and supporting documentation. The AUSNUT 2023 nutrient dataset contains 58 nutrient values for 3,741 foods reported in the NNPAS. Vitamin D was included in the survey dataset for the first time.

Conclusions: Up to date data on the nutrient content of Australian foods is available to allow food and nutrient intakes to be estimated from the 2023 NNPAS. The database is also available for wider use by regulatory government agencies, nutrition researchers, the food industry, dietitians and students.

Keywords: Australia; national nutrition survey; food composition database

(P4.150) *Bioactive compounds in carrot juice (Daucus Carota L.)*

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Background and objectives: Carrot juice is a natural source of bioactive compounds, including polyphenols, flavonoids, and carotenoids, which play a key role in human health due to their antioxidant activity. The composition of these compounds can be influenced by factors such as carrot variety, extraction method, and storage conditions. It has been reported that ultrasound, a non-thermal technology, can enhance the efficiency of bioactive compound extraction, improving their availability in juice. This study evaluated the composition of bioactive compounds and physicochemical properties in carrot juice. For this purpose, carrots were sanitized, ground, and subjected to ultrasound treatment before juice extraction. Different ultrasound conditions were applied (30, 35, and 40°C, with durations of 5, 10, and 15 minutes), assessing their impact on the final juice composition.

Methods: The obtained extracts were analysed for physicochemical properties (juice yield (%R), pH, soluble solids (SS), colour difference (ΔE*), and browning index (BI)), as well as bioactive compound content (Total Polyphenols (PT), Total Flavonoids (FT), Antioxidant Capacity (CAOX), and Total Carotenoids (CT)).

Results: The concentration of bioactive compounds in carrot juice is significant, and the use of ultrasound increased their extraction, with notable values obtained for CT (27.17±0.24 mg/L), FT (46.47±6.67 mg catechin equivalent/100mL), PT (188.33±0.82 mg GAE/100mL), and CAOX (2423.53±270.74 mmol Trolox equivalent/L). The best condition found was ultrasound treatment at 30°C for 10 minutes, which achieved the highest increase in total carotenoid concentration and antioxidant capacity.

Conclusions: The composition of carrot juice confirms its potential as a natural source of antioxidants, making it a healthy alternative for daily consumption. These results suggest that ultrasound treatment can be an effective strategy to improve the extraction of bioactive compounds in carrot juice, optimizing its nutritional and functional value. Furthermore, ultrasound at 30°C for 10 minutes appears to be the best option to maximize bioactive compound concentration without negatively affecting the physicochemical properties of the juice.

Keywords: carrot juice, bioactive compounds, antioxidants

(P4.154) *Reliability of the reference food composition data for nutrient intake: the case of dietary sodium intake*

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Background and objectives: Excessive salt intake is a major public health concern, contributing to high blood pressure and increasing the risk of hypertension and cardiovascular diseases. In response, countries have implemented legislative measures and educational initiatives to reduce salt consumption. Accurate assessment of dietary sodium intake is crucial for effective monitoring and intervention. This study aimed to evaluate the reliability of food composition data in estimating sodium (Na) intake using two approaches, from recipes and two dietary reporting methods, versus analytically determined values.

Methods: The Na content of 5 identical daily menus (breakfast, lunch and two snacks) in 4 kindergartens was assessed using their recipes for meal preparation and the OPEN dietary assessment tool based on the national food composition database. Duplicate meal portions were collected and analysed as composite samples for Na content using the AOAC 999.11 method. In the second approach 50 healthy adults provided two 24-hour urine samples for Na analysis, collected one month apart, and completed two dietary assessment questionnaires: Food Frequency Questionnaire for Salt Intake (FFQ-salt) and a 24-hour dietary recall at both times. Na intake from the 24-hour dietary recall was estimated using OPEN, whereas Na intake from the FFQ was calculated using portion size and frequency factors.

Results: The Na content in the daily kindergarten menus, determined by atomic absorption spectroscopy, ranged from 1.70±0.26 to 2.46±0.73 g/menu, with an average of 2.00±0.52 g/menu. With OPEN, the estimated Na content was 6.9% lower, with a mean of 1.86±0.90 g/menu (range: 0.93±0.21 to 2.51±0.39 g/menu). In adults, the average Na intake based on 24-hour Na excretion with urine was 3.12±1.36 g/day. The Na intake estimated by the 24-hour recall method was 18% lower, at 2.56±1.36 g/day. The Na intake from the FFQ-salt was 41% higher than the excreted amount in urine (4.48±1.88 g/day). A weak correlation was found between the three methods, and the kappa coefficient and quantile analysis indicated considerable variability in individual intake estimates.

Conclusions: Recipe-based Na estimations and composite meal analyses suggest that Na content data in the Slovenian food composition database are sufficiently accurate. Calculating Na intake from precise recipes is reliable when actual consumption aligns with the planned menu portions. However, when intake relies on self-reported data, discrepancies can arise due to reporting errors and individual variability. This highlights the need for careful interpretation of dietary assessment methods and underscores the importance of using objective biomarkers for accurate Na intake evaluation.

Keywords: sodium intake, Slovenian Food Composition Database, kindergarten menu, self-reported dietary assessment methods, 24-hour urinary sodium excretion

(P4.155) *Food composition databases – application for sustainable healthy diets and food systems transformation*

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Background and objectives: Food composition data is a conflicting issue for Indigenous Peoples. On the one hand, it offers an avenue through which to preserve and promote the diverse foods present in Indigenous Peoples' food systems, which helps to support their food and nutritional security. On the other hand, it presents significant risk of the appropriation and misuse of Indigenous Peoples' knowledge and nutritional sources. The food composition community is well-sensitized to the topic of biodiversity for food and nutrition, but more sensitization is needed for promoting the role of Indigenous Peoples as the recognized guardians of vast stocks of the world's traditional edible plant and animal species. In this context, guidance is needed for the appropriate use of food composition data that pertains to foods used by Indigenous Peoples. This session will present explore the opportunities and risks of food composition data for Indigenous Peoples, in relation to the development of a new set of guidelines that seek to promote Indigenous Peoples' rights within the use of such data.

Only a rights-based approach that respects Indigenous-led research and development can ensure that Indigenous Peoples benefit from, and are not harmed by, food compositional data and analysis. The new Guidelines provide ways of engaging with Indigenous Peoples in the generation and use of data and knowledge about their foods and offer ethical and right-based approaches to using food composition databases. Food composition databases must be used with respect to Indigenous Peoples' rights to data sovereignty. This means enabling access to data and control over how it is used (and re-used) to ensure that it can provide collective benefit to Indigenous Peoples.

When managed with respect to Indigenous Peoples' data sovereignty, food composition data can play an important role within Indigenous Peoples' self-determination, empowerment and food and nutrition security. Enabling authority and control over data for Indigenous communities is a growing challenge in the context of highly globalised foods systems, where foods are used in many different countries and regions. Caution is thus needed to ensure that data on their foods is not used against them and beyond what they consented for.

Keywords: data sovereignty, Indigenous Peoples, food security, nutrition, Indigenous Peoples' knowledge

(P4.157) *Nutrient composition of Indigenous Peoples' foods of dietary importance from northeast India for sustainable diets, nutrition, and health*

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Background and objectives: Northeast India is home to over 475 diverse Indigenous Peoples' groups with rich cultural identities, customs, and linguistic heritage. The region is one of the world's most environmentally diversified areas ranking sixth among the 25 global biodiversity hotspots. The Indigenous Peoples' of the region leverage the abundant agrobiodiversity which includes thousands of wild foods collected from the forest as food. A nutrient composition database of Indigenous Peoples' foods is vital to highlight their nutrient richness, promote traditional diets and support data driven interventions to support food and nutrient security. Therefore, this study was taken up to document the compositional database of several Indigenous Peoples' foods.

Methods: Indigenous Peoples' foods (n=30) across 10 food groups were collected from Manipur, Meghalaya, and Nagaland, and analysed at ICMR-NIN using validated AOAC and IUPAC methodologies to determine proximate principles, energy, water- and fat-soluble vitamins, and minerals.

Results: Several foods showed high nutritional value: Examples of protein rich foods included dried *Colocasia esculenta* leaves (anishi 27.79/100g, *Juglans regia* (akajang 18.47g/100g), *Glycine max* (ali chami 18.84g/100g), *Glycine max* (axone 17.46/100g), and Coix (ngum 17.4g/100g). *Juglans regia* (64.51g/100g) and *Pinus pinea* (chilkosa 53.19g/100g) had the highest fat content. *Capsicum annum* L. (Hathei chilli 42.05g/100g) was high in total dietary fibrer. Mineral dense foods included *Colocasia esculenta* (24.73mg Fe/100g, 62.33µg Mn/100g, 4144mg K/100g, 402mg Mg/100g), *Parkia timoriana* (yongjak 1125.69mg K/100g, 365.53mg Mg/100g, 603.93mg Na/100g), *Pleurotus ostreatus* (oyster mushroom 1903mg K/100g, 553mg P/100G), *Capsicum annum* L (3316.14mg K/100g), *Phyllostachys edulis* (1796mg K/100g),- and *Cinnamomum verum* (Rum Sachikam 266.03mg Ca/100g). Vitamin-rich foods were *Parkia timoriana* (12.28mg Vitamin B3/100g), *Capsicum annum* L. (10.75mg Vitamin B3/100g), and *Pleurotus ostreatus* (oyster mushroom 6.13mg Vitamin B3/100g). *Colocasia esculenta* had the highest total B6 (962µg/100g) and vitamin E (333.35mg/100g) content.

Conclusions: This study demonstrates the potential of several Indigenous Peoples' foods that are nutrient rich and can play a critical role in addressing malnutrition and strengthening sustainable diets. Mainstreaming these foods into the global food system can provide novel solutions to combat malnutrition, promote sustainable diets and recognize the importance of indigenous knowledge often overlooked in mainstream nutrition. Further the database will also play a key role for nutritionists, dieticians and other healthcare practitioners as a reference database.

Keywords: food composition, Indigenous foods, sustainable solutions, food security

(P4.158) *Impact of cooking methods on nutrition composition in bamboo rice: a comparative study*

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Background and objectives: Bamboo rice, seeds of the bamboo plant (*Bambusa arundinacea Willd*), is consumed mostly by the indigenous population of the Southwestern Ghats of India, for its health benefits. This study aims to investigate the impact of commonly practiced domestic cooking methods on the nutrient content of bamboo rice, focusing on nutrient retention.

Methods: Various cooking techniques, including conventional boiling, pressure cooking, rice cooker, and microwave cooking methods were employed to prepare bamboo rice. Pre-cooking processes such as washing and soaking were standardized. The proximate composition of bamboo rice was determined following the official methods of the AOAC, water-soluble vitamins (B2, B3, and total B6) were measured using High-Performance Liquid Chromatography (HPLC), mineral content was quantified using Atomic Absorption Spectrophotometry (AAS), and fatty acid composition was determined using Gas Chromatography-Flame Ionization Detection (GC-FID). Phytic acid content was analysed using anion exchange chromatography.

Results: The proximate composition analysis indicated that moisture content varied significantly among cooking methods, with microwave cooking resulting in the lowest moisture levels and conventional methods yielding the highest. Mineral analysis revealed that bamboo rice retained substantial amounts of essential minerals, including zinc, iron, and calcium, with lower phytic acid levels enhancing mineral bioavailability. The fatty acid composition remained stable across cooking methods, while water-soluble vitamins showed higher retention in microwave cooked samples compared to traditional methods. Notably, nutrient retention varied significantly, highlighting the importance of cooking techniques in preserving the grain's nutritional value.

Conclusions: The study underscores the critical role of cooking methods in maximizing the nutritional benefits of bamboo rice. Optimizing cooking practices can enhance dietary quality, particularly for populations that consume bamboo rice. Future research should explore consumer preferences and the impact of cooking methods on sensory attributes.

Keywords: bamboo rice, cooking methods, nutrient retention, micronutrients, macronutrients

(P4.159) *Results of the analysis determining the composition of commonly consumed food products in Mongolia*

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Background and objectives: Food composition data are essential for research on diet and health, dietary intake assessments, and public health issues. In 1997, the Nutrition Research Department of the National Center for Public Health compiled the initial version of the Mongolian Food Composition Database for commonly consumed food products. However, this food composition table lacked food numbers, and the range of analysed nutrients was limited. Since 2018, the Mongolian University of Science and Technology (MUST) has conducted a study to determine the composition of commonly consumed food products, funded by the Science and Technology Fund of Mongolia. This study analysed 8 nutrients in 400 commonly consumed food products.

Methods: A total of 400 commonly consumed food products from eight food groups were analysed, such as cereals, starchy roots and tubers, vegetables, fruits, meat and poultry, eggs, milk and dairy products, other food products. The study determined the content of moisture, ash, protein, fat, carbohydrates, calories, calcium, iron, and vitamin D using laboratory analytical methods at the Food and Nutrition Research Center.

Results: The study updated the nutrient database for 400 commonly consumed foods, analysing 10 key nutrients, such as moisture, ash, protein, fat, carbohydrates, calories, calcium, iron, and vitamin D. Among these, milk and dairy products contained the highest levels of calcium compared to other food groups.

Conclusions: This updated food composition database serves as an essential foundation for the Mongolian Food Composition Table and supports informed dietary assessments and policy decisions. Furthermore, the Institute of Food Research has been restructured and improved to enhance further food composition analysis and research to update the amino acids and fatty acids and others.

Keywords: food composition, food data base, country specific food

(P4.160) *New nutrient data on underutilized mature unripe jackfruit: composition of bulb, seed, and core*

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Background and objectives: Jackfruit (*Artocarpus heterophyllus* Lam.), a climate-resilient tropical fruit widely grown in Asia, remains underutilized despite its nutritional richness. While its ripe pulp is commonly consumed, the mature unripe fruit remains underutilized, and the seed and core are often discarded, representing a significant food waste challenge. This study aims to generate new compositional data on the nutritional profile of jackfruit bulb, seed, and core from mature unripe fruit to assess their potential as functional food ingredients.

Methods: Mature unripe jackfruits were collected from local markets. The bulb, seeds, and core were separated, processed into powder, and analysed for proximate composition (AOAC, 2023). Mineral content was determined using ICP-OES, while total phenolics and antioxidant activity were assessed using the Folin–Ciocalteu and DPPH assays, respectively. The glycaemic index was estimated through in vitro starch digestibility assays.

Results: The jackfruit bulb on dry basis contained 76.3 ± 0.5% carbohydrates, 6.05 ± 0.78% protein, 1.62 ±0.37% of fat, 12.13 ± 0.88% of total dietary fibre, and 41.26 ± 1.03% resistant starch, with a significant carotenoid content (36.656 mg/100g). Phytochemical analysis of the fruit bulb resulted in 35.16 ±0.50% of amylose content, 0.068% of phytate content, 49.95 ± 0.25% of total starch and 41.26 ±0.49% of resistant starch. Jackfruit seed exhibited 9.93 ±0.84% protein, 74.25 ±1.66% carbohydrates, 1.21 ±0.19 fat and 14.3 ±0.79% total fibre on dry basis. It showed 44.98 ±0.23% starch content with a resistant starch content of 38.28 ±0.02%. The jackfruit core was notable for its high dietary fibre (61.66 ±1.05% dry basis), antioxidant activity (93.25% DPPH), and low predicted glycaemic index (52.2), making it a promising ingredient for diabetic-friendly applications. It had a protein content of 4.5±0.51% and mineral analysis revealed significant amounts of potassium, phosphorus, and iron across all components.

Conclusions: This study provides new compositional data on the bulb and often-wasted seeds and core of mature unripe jackfruit, demonstrating their potential as functional food ingredients. The findings highlight the importance of integrating these underutilized components into food composition databases and developing sustainable food products to reduce waste and enhance dietary diversity.

Keywords: food analysis, food composition, jackfruit, unripe fruit, jackfruit core

(P4.164) *Mapping the evidence of novel plant-based foods: A systematic review of nutritional, health, and environmental impacts in high-income countries*

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Background and objectives: Shifting from current dietary patterns to diets rich in plant-based (PB) foods and lower in animal-based foods (ABF) is generally regarded as a suitable strategy to improve nutritional health and reduce environmental impacts. Despite the recent growth in supply and demand of novel plant-based foods (NPBF), a comprehensive overview is lacking. This review aims to synthesise available evidence; highlight challenges; inform public health and environmental strategies, and inform purposeful political decision making by systematically searching, analysing and summarising the available literature.

Methods: Five peer-reviewed databases and grey literature sources were rigorously searched for publications (2016 – 2022). Study characteristics meeting the inclusion criteria regarding NPBF nutrient composition, health and environmental outcomes in high-income countries were extracted.

Results: Fifty-seven peer-reviewed and thirty-six grey literature sources were identified. NPBF typically has substantially lower environmental impacts than ABF, but the nutritional contents are complex varying considerably across brands, product type and main primary ingredient. In the limited evidence on the health impacts, shifts from ABF to PB meats were associated with positive health outcomes. However, PB drinks results were mixed, with links to micronutrient deficiencies.

Conclusions: If carefully selected, certain NPBF have the potential to be a healthier and nutrient-rich alternative to ABF and typically have lower environmental footprints. More disaggregated categorisation of various types of NPBF would be a helpful step in guiding consumers and key stakeholders to make informed decisions. To enable informed policymaking on the inclusion of NPBF in dietary transitions as part of a wider net-zero and health strategy, future priorities should include nutritional food standards, labelling and sub-division/categorisations of NPBF, as well as short and long-term health studies evaluating dietary shifts from ABF to NPBF and standardised environmental impact assessments, ideally from independent funders.

Keywords: plant-based, meat substitutes, dairy substitutes, diet change, climate change, sustainable diets

(P4.165) *The role of dietary diversity and species richness in nutrient adequacy: insights from the Khasi tribe of Meghalaya, Northeast, India*

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Background and objectives: Dietary diversity and species richness play a crucial role in determining nutrient adequacy and food biodiversity. This study explores the relationship between dietary species richness (DSR), dietary diversity score (DDS), and mean probability adequacy (MPA) of micronutrients among individuals of the Khasi tribe. The study assesses dietary quality based on the number of food groups and species consumed, highlighting the importance of both indigenous and commonly available foods. The research aims to establish the correlation between food biodiversity indicators (DSR and Simpson's Index) and dietary adequacy indicators (DDS and MPA).

Methods: A cross-sectional study was conducted using dietary intake data collected through a 24-hour recall and seasonal recall method. The DDS was determined based on the number of food groups consumed, while DSR was measured as the number of unique species consumed per individual. The Simpson's Index (SI) was used to account for both richness and evenness in food intake. Pearson's correlation was applied to assess the relationship between DSR, DDS, SI, and MPA. Statistical analyses included ANOVA, post hoc LSD tests, and t-tests for comparison across age groups and physiological statuses.

Results: The study found that DDS was highest among children aged 10–12 years (9.07 ± 1.38) and 13 – 15 years (9.25 ± 1.28) and adults (9.60 ± 1.32), while younger children and elderly individuals had slightly lower scores. DSR exhibited a strong positive correlation with DDS and MPA in younger age groups (1–9 years) but showed a weakened or negative association in adolescents (16–18 years). SI was positively correlated with DSR but had a weaker association with MPA compared to DDS. Seasonal variations influenced food biodiversity, with indigenous foods being most available in the winter season.

Conclusions: The findings highlight that increased species diversity in diets enhances nutrient adequacy, particularly among younger age groups. However, the relationship weakens in adolescence, suggesting shifts in dietary patterns. Promoting diverse diets rich in species can significantly improve micronutrient intake and overall nutritional status. The study underscores the importance of biodiversity conservation and dietary diversification strategies to ensure food security and nutritional well-being across different age groups.

Keywords: dietary diversity, species richness, nutrient adequacy, food biodiversity, indigenous food systems

(P4.177) *The periodic table of initiative: the standardization challenge*

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Background and objectives: Non-targeted metabolomics provides an opportunity for high-throughput, comprehensive characterization of nutrient composition in food. However, a lack of standardization inhibits effective comparison of data across experiments and laboratories. Achieving a comprehensive understanding of global food composition is beyond the scope of any single laboratory. Therefore, there is a critical need for strategies to align analytical approaches to create a globally relevant, accessible, and comprehensive knowledgebase of food composition. The Periodic Table of Food Initiative (PTFI) has addressed this challenge through the development and validation of standardized workflows for the analysis of food.

Methods: Food samples were processed through lyophilization and homogenization. Small molecules were extracted with 80% methanol followed by purification with solid phase extraction and introduction of a novel PTFI internal retention time standard (IRTS). Nontargeted metabolite profiling by LC-MS was performed using standardized reverse phase chromatographic conditions and detection by high-resolution mass spectrometry (Q-TOF or Orbitrap). Data were processed using a novel PTFI workflow for peak picking and alignment. The annotation of detected compounds was performed by matching to the PTFI Global Consensus Library (GCL). This workflow was used to profile 500 diverse foods.

Results: Standardization of protocols resulted in the observation of several thousand unique compounds detected across labs in five selected foods. Signals from the novel PTFI IRTS reagent - which was added to each food during extraction - enabled calibration of compound retention times which reduced cross-laboratory retention time drift to less than 5 seconds. Consensus of detection across laboratories and foods of similar type increased confidence that compounds are real food components and not detection artifacts. From the analysis of 500 diverse foods by multiple laboratories we have generated the first version of the GCL that contains ~30K unique compounds. While many of these compounds remain unnamed, this illustrates the potential for discovery of the nutritional dark matter. Future efforts will focus on the incorporation of additional analytical data and informatics tools to improve the characterization of these known-unknown compounds.

Conclusions: The PTFI standardized nontargeted metabolomics protocol enables generation of comparable next generation food composition data. Data from 500 foods demonstrates the immense chemical diversity across foods and provides a valuable resource to understand the relationship between food composition and human and planetary health.

Keywords: food composition, standardization, nontargeted metabolomics

(P4.178) *Improvement of nutrient content and assessment of consumer acceptability of blended bambara nut-beans products*

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Background and objectives: Malnutrition and food insecurity remain significant global challenges, particularly in sub-Saharan Africa. with protein and micronutrient deficiencies contributing to undernutrition. Bambara nut (*Vigna subterranea*) and cowpea (*Vigna unguiculata*) are highly nutritious but underutilized legumes. The study investigated the improvement of nutrient content and consumer acceptability of blended bambara nut-beans products.

Methods: This laboratory-based experimental study involved blending bambara nut and Cowpea into flour and mixing them in the ratio 100% cowpea; 90:10, and 80:20 cowpea: bambara nut blends for Moi-moi (a traditional steamed bean pudding) production. Nutrient and anti-nutrient composition of the samples were analysed using standard methods of AOAC, while sensory evaluation and acceptability was done on 9-point hedonic scale using 31 semi-trained panelists from University of Ibadan. Data was analysed using ANOVA at $p<0.05$.

Results: A 100g of the samples contained between 20.33-21.84 g protein, 7.60-7.87 g lipid, 2.09-2.18 g fibre, 40.09-41.26 g carbohydrates, 140.00-150.00 mg sodium, 420.00-440.00 mg potassium, 150.00-170.00 mg calcium, 360.00-380.00 mg phosphorus, 11.47-11.56 mg iron, and 377-378.0 Kcal energy. Increasing levels of bambara nut increased the fibre and mineral contents. The 80:20 blend Moimoi gave the best result in terms of mineral content, taste, aroma and texture.

Conclusions: The 80:20 blended ratio of Moi-moi preparation and consumption should be encouraged for better nutritional outcomes.

Keywords: malnutrition, food insecurity, bambara nut, cowpea, moi-moi

(P4.184) Analysis of nutrients and contaminants in vegetables from the Norwegian market

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Background and objectives: Health authorities around the world recommend a varied diet with lots of plant-based foods. Knowledge on nutrient and contaminant contents in foods are crucial for intake assessments and dietary research. The Norwegian Food Safety Authority annually coordinate and update the Norwegian Food Composition Table (NFCT) with analytical data of nutrients in selected food groups. The aim of the present study was to analyse various nutrients and contaminants in the most consumed vegetables available in the Norwegian market.

Methods: Samples of carrot, cabbage, onion, cauliflower, broccoli and tomatoes were collected at wholesalers in two regions of Norway in March and in September 2024. Four composite samples consisting of three different baches were analysed for each vegetable type. In total 24 raw analytical samples of vegetables were assessed for several macro- and micronutrients including nitrate and heavy metals using methods accredited according to the ISO/IEC 17025 standard at Institute of Marine Research (IMR). Additionally, per- and polyfluoroalkyl substances (PFAS) and heavy metals were analysed in 72 individual vegetables samples collected in September.

Results: The vegetables contained on average 91% water. Dietary fibre content varied from 1.4 g/100g in tomato to 4.1 g/100g in onions. Carrots had highest β-carotene content of 5688 ± 823 µg/100g (mean ± SD). β-carotene in tomato and broccoli was 398 µg/100g and 129 µg/100g, respectively. Vitamin C was 12.6 ± 8.9 mg/100g in all six types of vegetables and vitamin K1 varied from 0.60 in onions to 108 µg/100g in broccoli. Folate content in all vegetables was 50.4 ± 39.6 µg/100g. Calcium content was 30 ± 15 mg/100g in all vegetables and potassium varied from 185 mg/100g in onions to 420 mg/100g in broccoli with a mean of 278 ± 82 mg/100g in all six vegetables. The selenium and fluoride content were low in all vegetables and varied from below limit of quantification (bLOQ) to 0.8 µg/100g and bLOQ to 0.4 mg/100g, respectively. Broccoli, cabbage and cauliflower had on average 42 ±18 mg/100g nitrate, whereas the average was 2.5 ± 1.8 mg/100g in carrot and tomato and bLOQ in onions. Total arsenic, mercury, lead and cadmium contents were mostly bLOQ in all vegetables. All PFAS analysis were bLOQ. The study has provided analytical values for macronutrients, 11 vitamins, 12 minerals, nitrate, heavy metals and PFAS in six commonly consumed vegetables.

Conclusions: The findings have been used to update the recipes containing these vegetables in the NFCT, where the nutrient data are now available. Vegetables are low in energy and by including a variety of them in every meal throughout the day, they can provide several important vitamins and minerals, contributing to a balanced diet.

Keywords: food composition data, nutrients, contaminants, vegetables, analysis

(P4.186) *Establishment of Asian Food Composition Database in the Philippines*

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Background and objectives: Food composition tables and databases (FCDB) are essential for understanding human nutrition, recommending appropriate dietary interventions, analysing nutrient intakes, formulating nutritional guidelines for a specific population, and crafting nutrition, food security, health, and agricultural policies. This three-year project aims to preserve Asian food culture and biodiversity and improve the capacity of Asian Food and Agriculture Cooperation Initiative (AFACI) member countries to establish an FCDB. The project also seeks to integrate the databases created by AFACI member countries to build the Asian Food Composition Database.

Methods: To establish the FCDB of the Philippines for the project, a steering committee was established to recommend food items. The project team collected fresh samples from 10 different commercial and distribution sources in various regions and three branded samples for processed food. All 100 homogenized samples were submitted to selected ISO-Certified Laboratories for proximate (energy, moisture, protein, fat, ash, carbohydrates) and nutrient analyses (vitamin A, C, B1, B2, and B9, calcium, iron, sodium, potassium, and phosphorus).

Results: In addition to improving the team members' capacity for FCDB development, the project included food composition analyses of products from various small and medium enterprises to support their food registration and labelling efforts. Several recipes for supplementary feeding programs were also analysed.

Conclusions: This project not only improves the capacity of AFACI member countries to set up an FCDB but also provides essential infrastructure for food and nutrition research and promotes regional advocacy and international cooperation.

Keywords: Philippines, FCDB, capacity building

(P4.188) *Food composition analysis of traditional Mexican foods using foodomics: insights from the MAPAMEX project*

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Background and objectives: Accurate food composition data is essential for understanding the nutritional and functional properties of traditional foods. The MAPAMEX project, in collaboration with the Periodic Table of Food Initiative (PTFI), aims to generate high-resolution compositional data on traditional Mexican foods using advanced foodomics technologies, including proximal chemical analysis, lipidomic, and metabolomic. This integrative approach provides a deeper understanding of the biochemical diversity in these foods beyond conventional nutrient profiles.

Methods: A chemical proximal analysis was conducted on a variety of Mexican foods—including fruits, vegetables, tubers, cereals, and fungi—to determine moisture, protein, fat, carbohydrate, and ash content. Additionally, lipidomic analysis is being performed to characterize the lipid species, including phospholipids, sphingolipids, and bioactive lipid. Metabolomics profiling was carried out on six representative foods: *Psidium guajava* (guava), *Amaranthus* spp. (amaranth), *Persea americana* (avocado), *Mangifera indica* (mango), *Opuntia ficus indica* (nopal) and *Zea mays* (corn tortilla), using standardized PTFI analytical methods.

Results: The chemical analysis highlights the diverse macronutrient composition of these foods. Notably, *Persea americana* (avocado) and *Chenopodium berlandieri* (quelite cenizo) exhibit significant lipid content, whereas *Ipomoea batatas* (camote morado) and *Tamarindus indica* (tamarind) are rich in carbohydrates. The lipidomic study is generating detailed molecular insights into lipid diversity, complementing existing nutritional data. The metabolomics dataset enhances the biochemical characterization of these foods, providing additional functional and nutritional insights.

Conclusions: By integrating multi-platform foodomics methodologies, the MAPAMEX project is expanding the PTFI food composition database, improving the understanding of traditional Mexican food matrices. These findings will support the development of sustainable and culturally relevant dietary recommendations, emphasizing the importance of traditional foods in health and nutrition.

Keywords: foodomics, chemical proximal analysis, lipidomics, metabolomics, traditional Mexican foods

14TH INTERNATIONAL FOOD DATA CONFERENCE

Food composition databases: application for healthy diets and sustainable agrifood systems transformation

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