



DEM02- The Nutrition and Lifestyle Demonstrator

Professor Eileen Gibney, UCD Institute of Food and Health, University College Dublin (UCD), Ireland



FNS-Cloud vision

FNS-Cloud will help overcome European research fragmentation by **integrating and federating** existing food nutrition security (FNS) data, tools and services, to provide added value **FAIR data** that can **reduce knowledge gaps**, facilitate **better research and exploitation**, **inform policy**, and help deliver sustainable diets to European citizens.









Foc pro

-Towards the Fairification of Food & Health data 3 RQ 1: Assess factors which influence dietary patterns & adherence to sustainable healthy eating guidelines Determine if selected datasets are 5 suitable for use in the specific research question RQ 2: Does diet quality and dietary intake differ - Quality Framework across key adult life stages and are these influenced USE FNS tools & services to MERGE & by demographic factors, such as European region and HARMONISE datasets – sex? FFQ mapping, **OBTAIN** access to StandFood, others? datasets-FoodCASE and other data repositories, FNS **IDENTIFY** potential catalogue, IP datasets containing permissions etc. parameters of interest FIND DATASETS - Use FNS catalogue to find relevant datasets for the specific research question -Use existing data or find Catalogue search data to answer the research question

The 'Nutrition Researcher' Journey



Session Overview

	1. Introduction to DEM02	(10 mins)
	•Overview of DEM02 process showcasing the 'researcher journey' through FNS-Cloud	
	2. Sourcing datasets to answer the research questions	(15 mins)
	3. Quality assessment tool for dietary intake datasets	(20 mins)
	•Development and application of the tool •Demonstration of the tool	
	4. Strategies for harmonising food identifiers: the StandFood method	(20 mins)
	 Introduction to the StandFood method How it was developed for DEM02 and results from its application Demonstration of how to use the method 	
	5. Merging and harmonisation of FFQ data	(15 mins)
	 Challenges of harmonising and merging FFQ data Approach taken to merge and harmonise FFQ data in DEM02 	
)	6. Wrap Up and Summary	(10 mins)
L	•Summary of session •Overview of initial analysis for RQ1 and RQ2	

<u>FNS_Research</u> Journey.mp4 (sharepoint.com)



Sourcing datasets

| Dr Laura Bardon, QIB UK

Dr Michelle Weech, UoR UK







RQ 1: Assess factors which influence dietary patterns & adherence to sustainable healthy eating guidelines





Assess quality

Newly generated data





CD Institute of ood and Health

FNS-Cloud WP4 Field Lab 1. Ireland; 2021/2022

FNS-Cloud network



Dutch National Food Consumption Survey. The Netherlands; 2012/2016

Serbia EUMenu; 2017-2021 Serbia CHANCE; 2012 Serbia-FOLATE women; 2015 North Macedonia; 2014/2015 Bosnia and Herzegovenia EUMenu Montenegro EUMenu

Published by:	Department of Health and Social Care
Last updated:	01 October 2013
Topic:	Health
Licence:	Open Government Licence
Summary	
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National Diet and Nutrition Survey. The UK; 2019 Estonia National Dietary Survey Estonia; 2014/2015 National Food, Nutrition, and Physical Activity Survey (IAN-AF). Portugal; 2015/2016

Task 4.4.3 – Field Lab 2: Collection of dietary intake data in vulnerable populations (65+ years)



Existing online Food Frequency Questionnaire (FFQ) previously developed by UoR

Redeveloped within FNS-Cloud to increase usability by UK older adults (guided by qualitative feedback & formative studies with adults aged 65+ years using eNutri)



Online FFQ adapted from eNutri & developed by TUM as part of FNS-Cloud to comply with German data protection regulations

Developed for use by older adults (guided by national nutrition surveys & qualitative feedback on eNutri)



Merge and harmonise

Task 4.4.3 – Field Lab 2: Validation of eNutri/WIE FFQ tools against validated reference methods & biomarkers of dietary intake





n=91 completed Aged 65+ years Test method: eNutri FFQ65+ (day 1)





Dried blood spotsUK reference- biomarkers ofmethoddietary intake3x 24h recalls

Repeated eNutri FFQ65+ (day 14)



n=51 completed Aged 60+ years German version as reference method At least 2x 24h recalls within 14 days

myfood



Test method: WIE60+ (after 24h recall completion)



Repeated WIE60+ (14 days after)



DE



RQ 2: Does diet quality & dietary intake differ across key adult life stages & are these associations influenced by demographic factors, such as European region & sex?





Dataset generated within FNS-Cloud (WP4)*





DEM02 group*

Existing datasets from

• eNutri FFQ65+



Contacted data owners (PIs) with research plans & requested permission to use datasets for RQ2

Written permission was granted by PI & all co-investigators

Datasets shared



*Status of datasets during the 'identification' stage of DEM02 whilst FNS-Cloud catalogues were under development



What





Development and application of a quality assessment tool for dietary intake datasets

Dr Laura Bardon

Quadram Institute Bioscience, United Kingdom



Development of a quality assessment tool for reuse of dietary intake datasets

- With increasing data reuse, it is important that data selected for reuse is *appropriate* for the research question being posed
- Researchers need to be supported in the decision-making process of assessing whether the data they are considering is suitable





Development of a quality assessment tool for reuse of dietary intake datasets

- Markers of quality identified within literature and from researcher knowledge
- Transformed each marker of quality into questions with Yes/No or categorical response options
- ~ Follow-up question(s)
- Developed individualised messages specific to the response option chosen
- Completed internal testing of framework structure with FNS-Cloud consortium





The quality assessment framework was then transformed into an online tool

Produces report providing the researcher with considerations to **support them in their decision** of whether the data they have selected is **appropriate for their** research question

User evaluation study of tool and academic paper in progress



	Research questions*		Assessment Flow			
	association between menopause and dietary p	patterns	What I eat FFQ 60+ Study Dataset	÷	Go to dataset	Assess
	(B) Method	Method >	Question-4	data?	Ski	2
	E Underlying data sources		FFQ 24-hour recall	diet diary	other method	
Dataset Asses	sment Overview					
	Dataset select		Contraction of the			
Finished Unfinished assessment	by dataset Prosted - 67.5 % Unfinished : 12.5 %	Untinished groups - Anthropometric data Research question		Go to assesment		
		adherence to sustainable healt	thy eating patterns in European adults			
	10%	All messages Method • Validated- Comi data has been re biomarker(s) an be important for biomarkers were • Validated popul important that be similar to the that tools are us example, if the to approprate for number of peop	bination method and biomarker: The tool ported to be validated by comparing it to d another method of dietary intake data c r you to fully understand what methods an econsidered and the relative validity acros ation and sample size: When using a valid he population in which the tool was valid oppulation considered in the dataset. It i ed in the population in which they are val tool has been validated for use in children se in adult populations. Caution should b le incluided in the validation study(s) is ve	used to collect this objective ollection. It would nd what is these. ated tool it is ated is reported to salways important idated. For it may not be e taken if the may small.		



Food Nutrition Security Cloud (FNS-Cloud) has received funding from the European Union's Horizon 2020 Research and Innovation programme (H2020-EU.3.2.2.3. - A sustainable and competitive agri-food industry) under Grant Agreement No. 863059 - www.fns-cloud.eu

Quality assessment tool demonstration

• <u>Dataset Assessment (scalefocus.dev)</u>

RQ 1: Assess factors which influence dietary patterns & adherence to sustainable healthy eating guidelines

Portuguese National Food, Nutrition, and Physical Activity Survey (IAN-AF)

- Recalls conducted by trained interviewers
- Intake collected on multiple days on a combination of week and weekend days
- FCDB used is appropriate for the Portuguese population
- Contains nutrient information for range of macro and micronutrients
- Inadequate reporters not identified
- dataset coded with Foodex2

Decision: Use





Serbian EUMenu survey

- Recalls conducted by trained interviewers
- Intake collected on multiple days on a combination of week and weekend days
- FCDB used is appropriate for the Serbian population
- Contains nutrient information for macronutrients and energy only
- Inadequate reporters identified
- Dataset coded with Foodex2

Decision: Only use for food group analysis



RQ 2: Does diet quality and dietary intake differ across key adult life stages and are these influenced by demographic factors, such as European region and sex?

Food4Me baseline FFQ

- Data collected using a tool which was validated in an appropriate population (UK adults)
- Appropriate FCDBs were used (McCance and Widdowson's The Composition of Foods 5th and 6th editions) for standard FFQ food items and relevant national FCDB for country-specific food items
- Portion size information quantified using estimates
- Contains nutrient information for range of macroand micronutrients
- Dietary information collected for the previous month
- Under/over-reporters were identified and removed

Decision: Use



Serbian CHANCE FFQ

- Data collected using a tool which has not been validated
- FCDB used (2012 Serbian Food Composition Database) is appropriate for Serbian adults
- Portion size information is quantified using estimates
- Contains nutrient information for range of macro- and micronutrients
- Dataset in raw data format, where g/day needs to be calculated
- Dietary information collected for the previous month.
- Under/over-reporters were not identified

Decision: Use





StandFood-Data normalization

Barbara Koroušić Seljak

Computer Systems, JSI



Data normalisation?





Data standardisation





Data normalisation





Data standardisation using StandFood

- Coding of food consumption data and food composition data using the same food description and classification system
 - Food consumption data : *Basmati* | FCD: *Rice grain, long-grain*
- Basics of FoodEx2
 - Categories: raw, derivatives, simple (e.g., muesli, jam) or aggregated (e.g., soups, salads) composite foods
 - Base terms (describing food groups) and facets (additional information)
 - Rice grain, long-grain -> **A001F**#F01.A059Z\$F02.A066Q\$F27a.A001F



StandFood – step 1

Food classification into one of the four categories/ classes (r, d, s, c) using supervised ML approach

- Training performed on more than 5000 instances
- Ensemble learning (combining four classification algorithms: Support Vector Machine, Random Forest, Boosting, Max Entropy)





StandFood – step 2

Food description using NLP combined with probability theory – identification of a FoodEx2 list term using linguistic analysis

- POS (Part-of-speech) tagging
- Example: dried fruit dried (verb), fruit (noun)





Food_name₁ & Food_name₂

*N*₁={set of nouns extracted from Food_Name₁};

A₁={set of adjectives extracted from Food_Name₁};

V₁={set of verbs extracted from Food_Name₁};

N₂={set of nouns extracted from Food_Name₂}
A₂={set of adjectives extracted from Food_Name₂};
V₂={set of verbs extracted from Food_Name₂};

$$X = N \cdot (A + V)$$

$$P(X) = P(N) \cdot P(A + V)$$

$$\frac{P(N) = \frac{|N_1 \cap N_2|}{|N_1 \cup N_2|}}{|N_1 \cup N_2|}$$

$$P(A + V) = \frac{|(A_1 \cup V_1) \cap (A_2 \cup N_2)| + 1}{|(A_1 \cup V_1) \cup (A_2 \cup N_2)| + 2}$$



StandFood – step 3

Post-processing for improving the final food category





ER tager

Currate

How to apply StandFood?

- Original purpose:
 - To easily obtain FoodEx2 codes
- Basic principle:
 - Lexical similarity
- Methods:
 - POS tagging
 - Probability theory
- Pros:
 - Works great with short text (e.g., food names)

• **Cons:** Semantics cannot be captured— FoodViz (enables normalisation with food standards, e.g., FoodOn, SnomedCT, etc.)

		Recognized Entities for recipe 0recipe100	6		
Mix the crimedome , hours. Place a large sh refrigerate until needed	need, association, and Warson need of waxed paper on a flat sur L	Instantian Ingether in a bowl until evenly blended. Keeping the mixture in the bowl, sor risce. Sprinkle with another. Roll the Company with the another until completely covered. The	ape it into a semi-ball shape. Co anster the company to a serving	ver, and refrigerate until firm plate, or rewrap with waxed	1, at lea t paper
		Entity tags			
Entity	Synonyms	Hansard Tags	FoodOn	SnomedCT	OF
cream cheese	CREAM CHEESE	AG.01.e [Deiry produce]:AG.01.e.02 [Cheese]:AG.01.n [Dishes and prepared load]:AG.01.n.18 [Preserve];	000/FOODON_03301689	smct:226849005 smct:102264005 smct:265621006	
beef	BEEF	AG.01.d.03 [Beef];		amet:226016002	
olivos	OLIVES	AG.01.h.01.e (Fruit containing stone);		smct:227436000	
Select	olios.	Adoption of an One-symphotocycles	In Advantage		-
Worcestershire sauce	WORCESTERSHIRE SAUCE	AG 01.h [Fruit and vegetables];AG 01.104 [Sauceldressing]:	obs-FOODON_03305003 obs-FOODON_03311148	smct:443701000124100 smct:227519005	
wainuts	WALNUTS	AG.01.H.01.1 [Nut];	obo:NCBITaxon_16718		
cheese ball		AG.01 n.02 [Cheese]:AG.01 n.18 [Presarve]:			
walnuts	WALNUTS	AG.01.h.01 / [Nut];	obo NCBITaxon_16716		
cheese ball		AG.01,e.02 [Cheese]:AG.01,n,18 [Preserve]:			

http://foodviz.env4health.finki.ukim.mk



jam m walnu ajvar StandFood

Use cases / demonstrators

- Semi-automatic methods:
 - FoodEx2 coding
 - Mapping food consumption data to food composition data
 - Mapping foods across FCDBs
 - Mapping recipe ingredients to FCDBs

		1. Named-entity recognition to find the ingredients (e.g., BuTTER, FoodNER) 2. Lexical similarity for each ingredient separately
	Lexical similarity for each ingredient separately	minutes, then turn out onto a wire rack and cool completely. Slices can also be reheated for 20 to 30 seconds in the microwave before serving.
	Bay leaf Oil, sunflower, refined Corn pepper, seed, black	 trom heat, and stir in sugar, cocoa powder, eggs and vanilia. Pour into prepared cake tin. 3. Bake in preheated oven for 30 minutes. Let cool in tin for 10.
Lexical similarity	Garlic Onion Paprika, red, powder Salt, table, jodised	 In the top of a double boiler over gently simmering water, melt chocolate and butter. Remove
ed fruit average values	Baked bean, lean, sunflower oil • leek raw • Beans, white, dried	1. Preheat the oven to 150 C / Gas- 2. Grease a 20cm round cake tin, and dust with cocoa powder.
Food title	Structured list of ingredients	Food recipe description



Food consumption data

- First run: StandFood on all instances matching food names
 - 40.8% matches

Food item name	Match				
processed cheese, slices, plain	Processed cheese, sliceable				
farofa, with dried fruits and nuts	/				
wonton	/				
weetabix crispy minis	/				
twister	Mottled twister (as animal)				
mashed potato - butter	Potato, mashed (feed)				
mashed potato - no butter	Potato, mashed (feed)				
starch jelly, with soy sauce and salted vegetables	Starches				



Food consumption data

- Second run: StandFood on instances without matches matching with food groups
 - 25.8% matches

Food item name	Match
processed cheese, slices, plain	Cheese
weetabix crispy minis	Breakfast cereals
wonton	Savoury



Food consumption data

- Third run: StandFood on no matches/ incorrect matches from the first run
 - Considering food description up to the first comma (",")
 - 26.24% matches

Food item name	Match
starch jelly, with soy sauce and salted vegetables	Salted vegetables
mooncake, five nuts filling	Nuts coating
farofa, with dried fruits and nuts	Dried fruits (as part-nature)



Mapping recipe data to FCDB

 71,641 ingredients from 219,765 recipes (7 multilingual recipe datasets) mapped to FCDB





Implementation as a Web service

- Web services software components that can be accessed and executed remotely via a network by a client application using standard protocols
 - I/O provided in JSON format
 - Can be integrated with any client (e.g., FoodCase, Food24 etc.)





JSI CS Food Matching Web Services ⁽¹¹⁾

/food_services/openapi.json

This FNS-Cloud API supports food experts in estimating the net quantity of each complex food's ingredient based on mandatory information for prepacked foods, which requires ingredients to be listed in descending order of quantity. Complex foods refer to branded foods or food dishes having specified ingredients without the information about their quantities.

Users

You will be able to:

- Create users (registration)
- Verify user accounts (verify_registration)
- Request password reset (reset_password)
- Verify password reset request (verify_reset_password)
- Change password (change_password)

Services

- . Complex food ingredients parsing -- The complex food's list of ingredients is parsed considering various ways of labelling. It is required to list the ingredients in descending order of quantity.
- Food matching -- A list of food names (e.g., parsed from the complex food's list of ingredients) are matched with corresponding food items from a selected food composition database (FCDB). Foods to be matched and the food items from the FCDB need to be specified using the same language.
- . Ingredients quantity calculation -- A net quantity is calculated for each food item from the selected list of items, considering their descending order of quantity.

Terms of service

Computer Systems - Website Send email to Computer Systems

Servers ftood_services v	Authorize 🔒
registration Registration of new user account	^
POST /user/register Register	~
verify_registration Verification of the registration using token from registration email	^
POST /user/account/{token} Account Token	×



food_matching Matching food names with the food items from a selected food composition database

∧ 🗎 POST /food_matching Food Matching Parameters Try it out Description Name number_of_matches Number of matches to be returned (if more matches are considered equal all of them are returned) integer (query) Default value : 3 similarity_threshold The threshold [0,1) that defines minimal similarity number (query) Default value : 0.1 language_cc Only valid options are 'en' for English, 'si' for Slovene, or 'none' for others string (query) Default value : en split_operator List of operators to force split in entities array[string] (query) Example : split_operator= and parallel Level of desired parallelization integer (query) Default value : 2 Request body required application/json ~ Example Value | Schema "complex_foods": [- 6 "code": "string", "name": "string", "quantity": 0,



Food Nutrition Security Cloud (FNS-Cloud) has received funding from the European Union's Horizon 2020 Research and Innovation programme (H2020-EU.3.2.2.3. – A sustainable and competitive agri-food industry) under Grant Agreement No. 863059 – www.fns-cloud.eu

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Future work

- StandFood tool
- Multilingual support
 - Current solutions (English and Slovene)
 - Google Translate API tested for German and Hindi (for the recipe use case)
 - POS tagger must be available



Our team



Asst. Prof. Tome Eftimov, PhD Senior Researcher JSI



Prof. Peter Korošec, PhD Senior Researcher JSI



Dr. Gordana Ispirova Postdoctoral Researcher JSI



Prof. Barbara Koroušić Seljak, PhD Senior Researcher JSI

Main access point for the web services: FNS-Cloud Catalogue, <u>Swagger documentation</u> available

Our publications: myFNSCloud





FFQ merging & harmonisation

Dr Michelle Weech

University of Reading, United Kingdom



FFQ merging & harmonisation

- Brief introduction to food frequency questionnaires (FFQ)
- Challenges of merging & harmonising FFQ data
- Our approach to merging & harmonising FFQ data





Food Frequency Questionnaires (FFQs)

- Method of assessing past dietary intake (i.e., retrospective)
- Includes a list of food and drink items (specific to the FFQ)
- Administered as paper-based questionnaires or online tools

Wholegrain breakfast cereals Any type including bran, All Bran, Bran Fla EXCLUDES cereal bars & non-wholegrain o	akes, Fruit & Fibre, Weetab cereals (e.g. cornflakes).	bix, Shreddies, Shredded Wheat & C	Cheerios.	3%		Fr H	reqเ ow	<mark>Jen</mark> ofte	<mark>cy:</mark> en v	vas	ead	ch F	FQ
Not in the last 4 weeks Less than once a week Once a week		2-4 times	a week	5-6 times a week		ite ti	em me	eat frar	en i ne,	n a suc	spe h a	cifi s th	ed e
Once a day	Twice a day	Twice a day 3-4 times		es a day 5+ times a day		р	revi	ous	yea	ar o	r m	ont	h?
			FOODS A	ND AMOUNTS	AVERAGE U	JSE LAS	ST YEA	R					
			BREAD A	ND SAVOURY BISCUITS or biscuit)	Never or less than once/month	1-3 per month	Once a week	2-4 per week	5-6 per week	Once a day	2-3 per day	4-5 per day	6+ per day
			White brea	ad and rolls						V			
			Brown brea	ad and rolls				V					
		Food Nutrition Security	Wholemea	I bread and rolls	/								
FNS-C Food Nutrition S	Ioud Security	programme (H2020-EU.3.	Cream cra	ckers, cheese biscuits		1							

FFQs

Portion size: Some FFQs also ask the typical portion size of each FFQ item, using images or descriptions (small, medium or large)

Think	ing about <u>the last 7 days</u> , how ofte	en did your ch	ild eat th	e foods li	sted below	w?					
No.	Type of Food	Never in the last week	1-2 per week	3-4 per week	5-6 per week	1-2 per day	3+ per day	Medium Portion Size (M)	s	М	L
Fruit	s and Fruit Juices										
1	Apple: raw, applesauce, juice, dried	0	0	0	0	0	0	lcup of fruit, applesauce or juice ½ cup dried	0	0	0
2	Apricot / Nectar: raw, canned, juice, dried	о	0	0	0	0	0	1 cup of fruit or juice ½ cup dried	0	0	0

Wholegrain breakfast cereals

Any type including bran, All Bran, Bran Flakes, Fruit & Fibre, Weetabix, Shreddies, Shredded Wheat & Cheerios. EXCLUDES cereal bars & non-wholegrain cereals (e.g. cornflakes).

What is your average portion size? (Select from the 7 options below).



FNS - Cloud

Data typically generated from FFQs

Assess quality



Average daily intakes for each FFQ item

Identify suitable data

e.g. g/day of cheese, g/d of whole milk Average daily energy & nutrient intakes

e.g. kcal/day, g/day of protein, mg/day of calcium Average daily food group intakes

Obtain access

Merge and harmonise

e.g. g/day of total dairy products



Find data

Aim of DEMo2 research question 2

To **harmonise** & **merge** existing FFQ datasets with new FFQ datasets (generated within FNS-Cloud project) to answer a new research question:

Does diet quality & dietary intake differ across key adult life stages & are these influenced by demographic factors, such as European region & sex?





8 European FFQ datasets were identified & obtained





Assess quality

FFQ datasets

- FFQs typically group similar foods together (e.g., citrus fruits)
 - Unlike diet diaries & 24h recalls that record at the food level (e.g., oranges, grapefruits, lemons)



 Food lists also differ between FFQs (both quantity & types of food items included)

This presented several challenges when harmonising & merging FFQ datasets



Challenge 1: FFQ datasets also included food group intakes, however, their definitions differed









Some FFQs included vegetables from ALL sources

E.g., whole vegetables used in homemade dishes & eaten as a side plus % of vegetables from shop-bought dishes, soups, etc.

eNutri FFQ65+ / ENVAL / eNutri-DE







Another FFQ included pulses as 'vegetables'

E.g., whole vegetables used in homemade dishes, eaten as a side, etc. plus pulses (e.g., baked beans, lentils, chickpeas)

Food4Me











Another FFQ included the total amount of 'vegetable products'

E.g., whole vegetables used in homemade dishes, eaten as a side, etc. plus total amount of vegetable-based dishes *(e.g., vegetable soup that may contain non-vegetable ingredients)*

CHANCE













For our research question, it was important to think ahead to how the diet quality score (DQS) would be calculated for analysis



1. Vegetables from all sources (e.g. whole vegetables plus % of vegetables from 'meat dishes', 'soups', etc.) – **this matched the DQS criteria**



- 2. Vegetables including pulses (e.g. baked beans, lentils, chickpeas)
- Recalculate 'vegetables' for Food4Me & EatWellUK using method 1



3. Vegetables including total amount of vegetable products (not % of vegetables)
 – Recalculate 'vegetables' for CHANCE using method 1

















Option 2: Merge individual FFQ items to create a combined item for all datasets







As before, it was important for us to think ahead to how the DQS would be calculated for analysis

Fruit & vegetable juices:

- Contributed to same DQS component
- All juices were combined (option 2)



'Milkshakes & smoothies':

- Food4Me & EatWellUK item
- Contributed to 'dairy' & 'fruit' DQS components, respectively
- Item was **split** (option 1)









Challenge 3: Country-specific FFQ items







Option 1: Remove from the merged FFQ dataset so only items consistent across all FFQ datasets are included







Option 2: Retain these items in the merged FFQ dataset even if they only appear in certain FFQs







Decision process

Again, we were required to think ahead to how the DQS would be calculated for analysis

Example: Baked beans

- Are one of the main dietary sources of pulses in the UK
- DQS calculation includes a 'pulses' component
- Excluding baked beans from UK datasets would underestimate intake of pulses & subsequently total DQS
- Decided it was important to include these country-specific items as they contribute to food groups





Benefits of merging FFQ data

- DEM02 has highlighted the complexity & decision-making required to successfully merge FFQ datasets
- Re-using and merging FFQ datasets with the aim of answering a new research question allows us opportunities that are otherwise not possible



Much larger sample size / greater statistical power



Access to datasets from different population groups (e.g., non-UK populations, different age groups)



Re-use of existing datasets avoided the need to perform additional costly & time-consuming research studies





FNS-Cloud Food Nutrition Securit

Post FNSCloud Journey: Individual researcher analysis

RQ 1: Assess factors which influence dietary patterns & adherence to sustainable healthy eating guidelines

- Cluster analysis based on dietary patterns
- Use ANOVA to compare characteristics of clusters with respect to:

a) adherence to sustainable healthy eating guidelines,

b) socio-demographic characteristics,

c) anthropometric characteristics

RQ 2: Does diet quality and dietary intake differ across key adult life stages and are these influenced by demographic factors, such as European region and sex?

- Calculate DQS
- Investigate relationships between DQS and age, using general linear model to compare age groups and/or linear regression





DEMo2 tools- key achievements



Population of catalogues with existing datasets



Intake dataset quality assessment tool



Academic paper in progress



Academic paper published



Academic paper in progress





DEM02 research questions- Key achievements



Selected 2 challenging research questions



Selected datasets collected across Europe



Populated FNS Cloud catalogues with existing datasets



Developed tool to support reuse of data which supports high quality research



Tested strategies for harmonising dietary data collected with similar methods

DEM02 Challenges and future considerations



https://www.fns-cloud.eu/











Special acknowledgement of our late collaborator and colleague Dr Marija Glibetić

All others from FNS-Cloud team



