

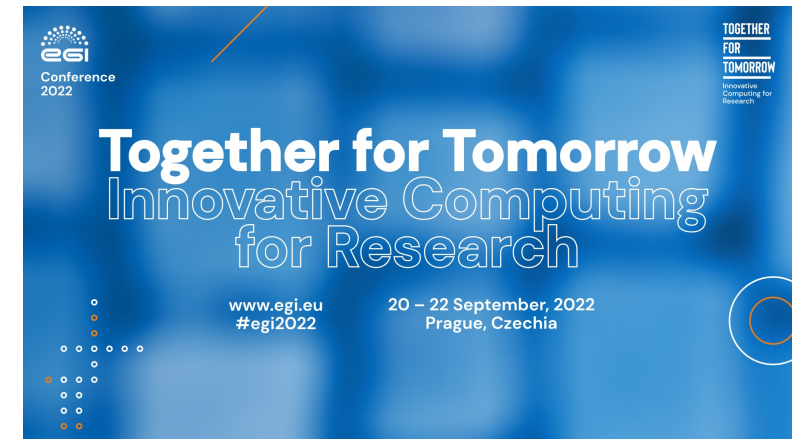


FNS - Cloud

Food Nutrition Security

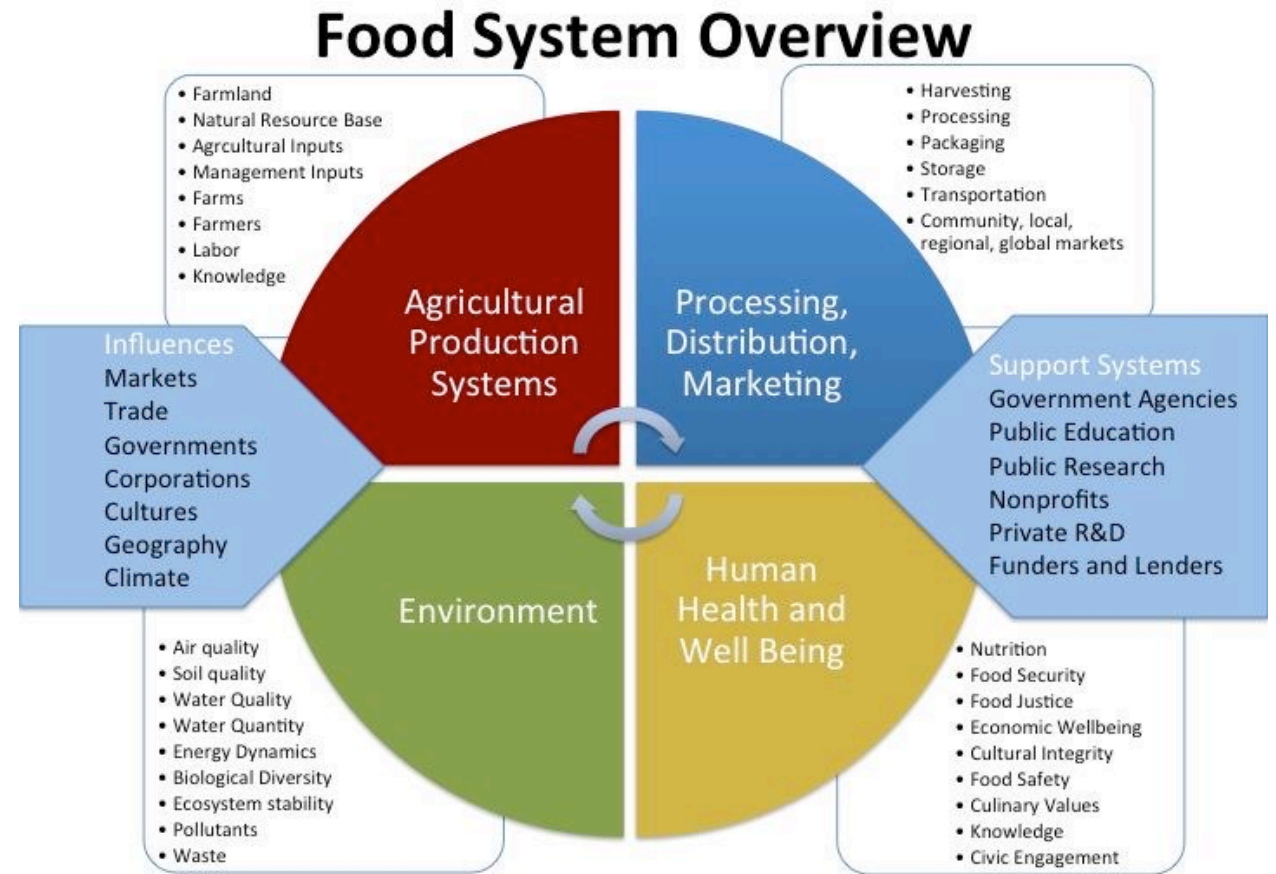
Interoperability & standardisation

Prof. dr. Barbara Koroušić Seljak
Jožef Stefan Institute, WP3 leader



Complexity from the content point of view

The domain of Food and Nutrition Security (FNS) is complex as it addresses so many different aspects.



<https://foodsystems.wsu.edu/foodsystemsprogram/>

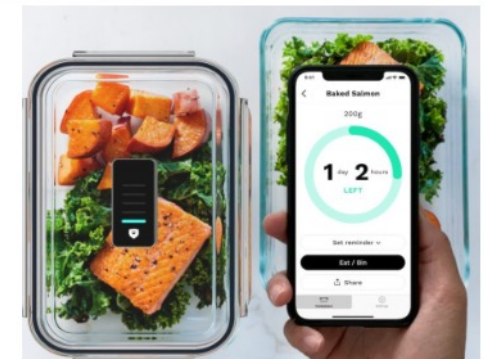
Heterogenous FNS data

This wide spectrum of FNS disciplines collects

- different types of data in
- various formats being
- described & classified using several, already well established, systems, such as LanguaL (FAO, EuroFIR), FoodEx2 (EFSA) etc.



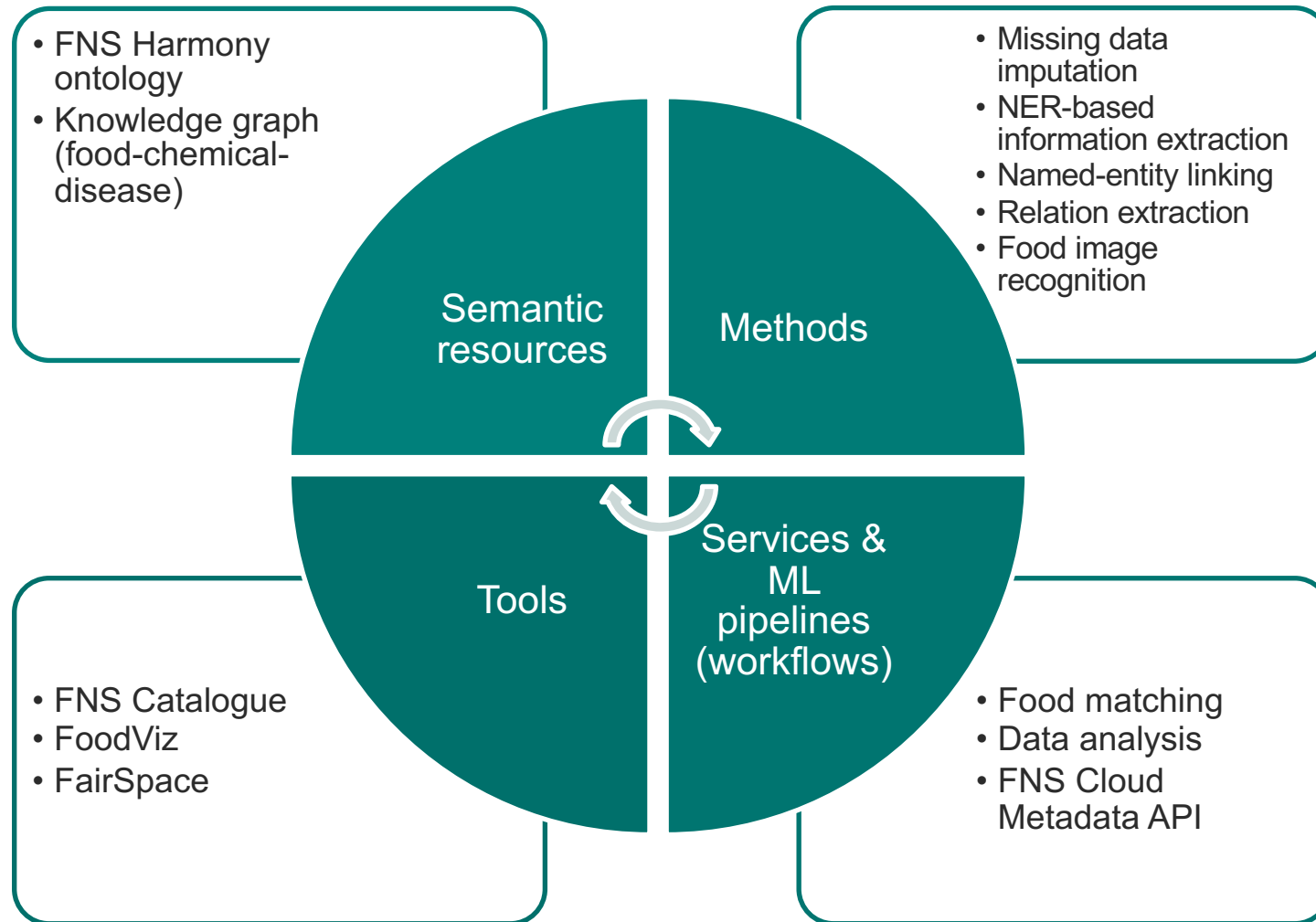
Nutrients (per 100 gm)	Unit	Staple Foods						
		Maize flour	Millet flour	Rice	Cassava fresh	Cassava flour	Matoke (plantain)	Beans
Energy	Kilocalories	369	374	360	160	314	1227	347
Protein	Grams	7.3	10.9	6.6	1.4	2.6	1.3	21.4
Fat	Grams	1.8	4.2	0.6	0.3	0.7	0.4	1.2
Carbohydrate	Grams	79.2	72.3	79.3	38.6	76.3	31.9	62.6
Calcium	Milligrams	2.1	3.0	9.0	0.0	31.0	3.0	3.0
Iron	Milligrams	1.1	3.0	0.8	0.3	1.9	0.6	5.1
Zinc	Milligrams	0.7	1.7	1.2	0.3	0.7	0.1	2.3



FNS Interoperability & Standardisation - relatively new research area

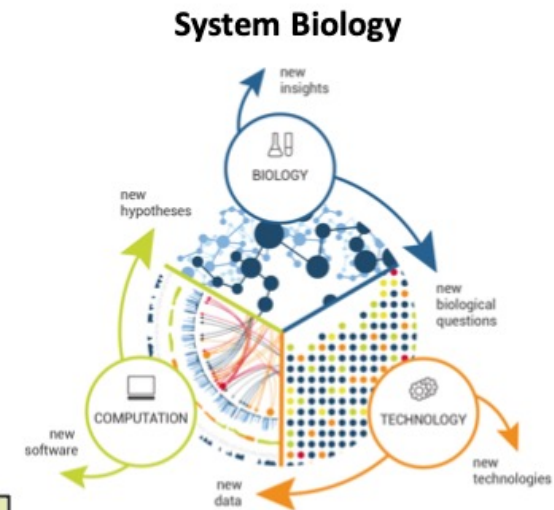
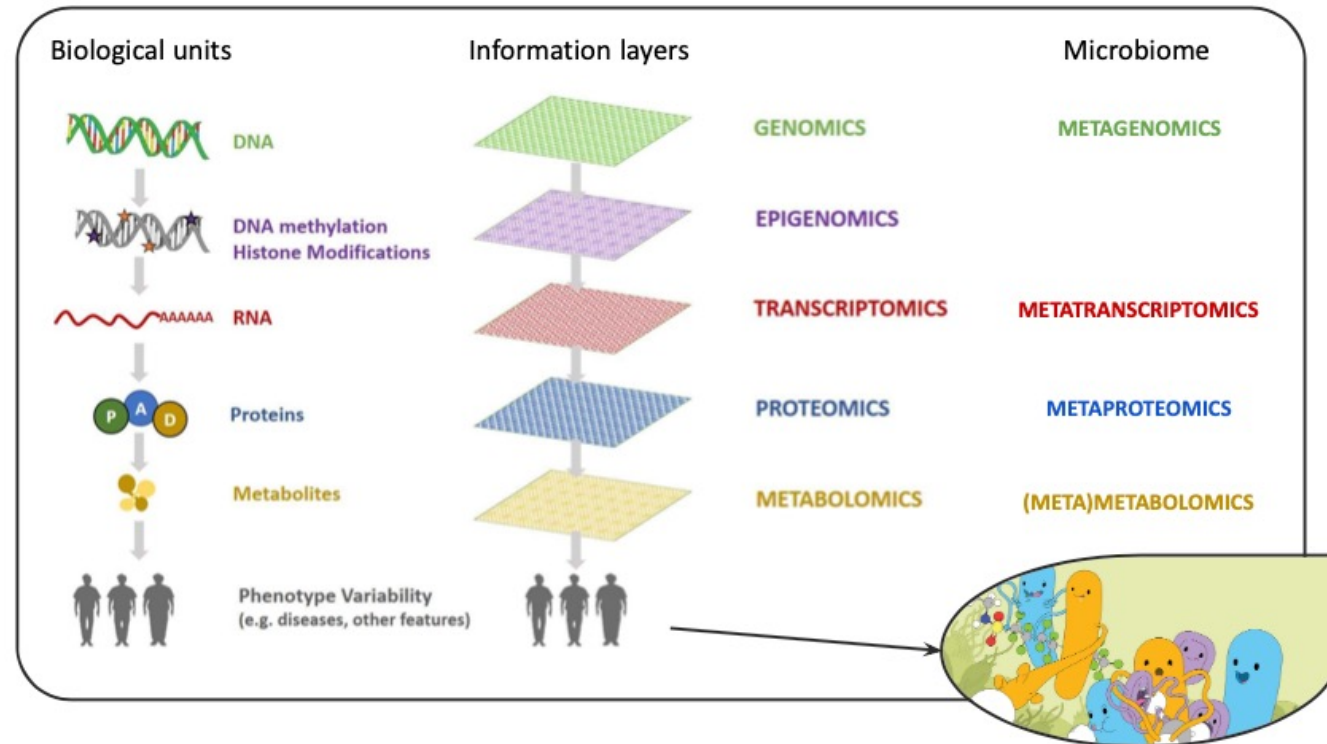
- In the past two decades, the biomedical domain has made a great progress in the development of methodology and semantic resources required for data interoperability and standardisation, while the FNS domain is still in the relatively early stage of the development:
 - Pioneering projects in this domain including but not limited to:
 - H2020 FNS-Cloud
 - H2020 Blue-Cloud
 - ESFRI Metrofood
 - EFSA Cafeteria
 - ELIXIR Food & Nutrition Use Case

What has been achieved in FNS Cloud so far?

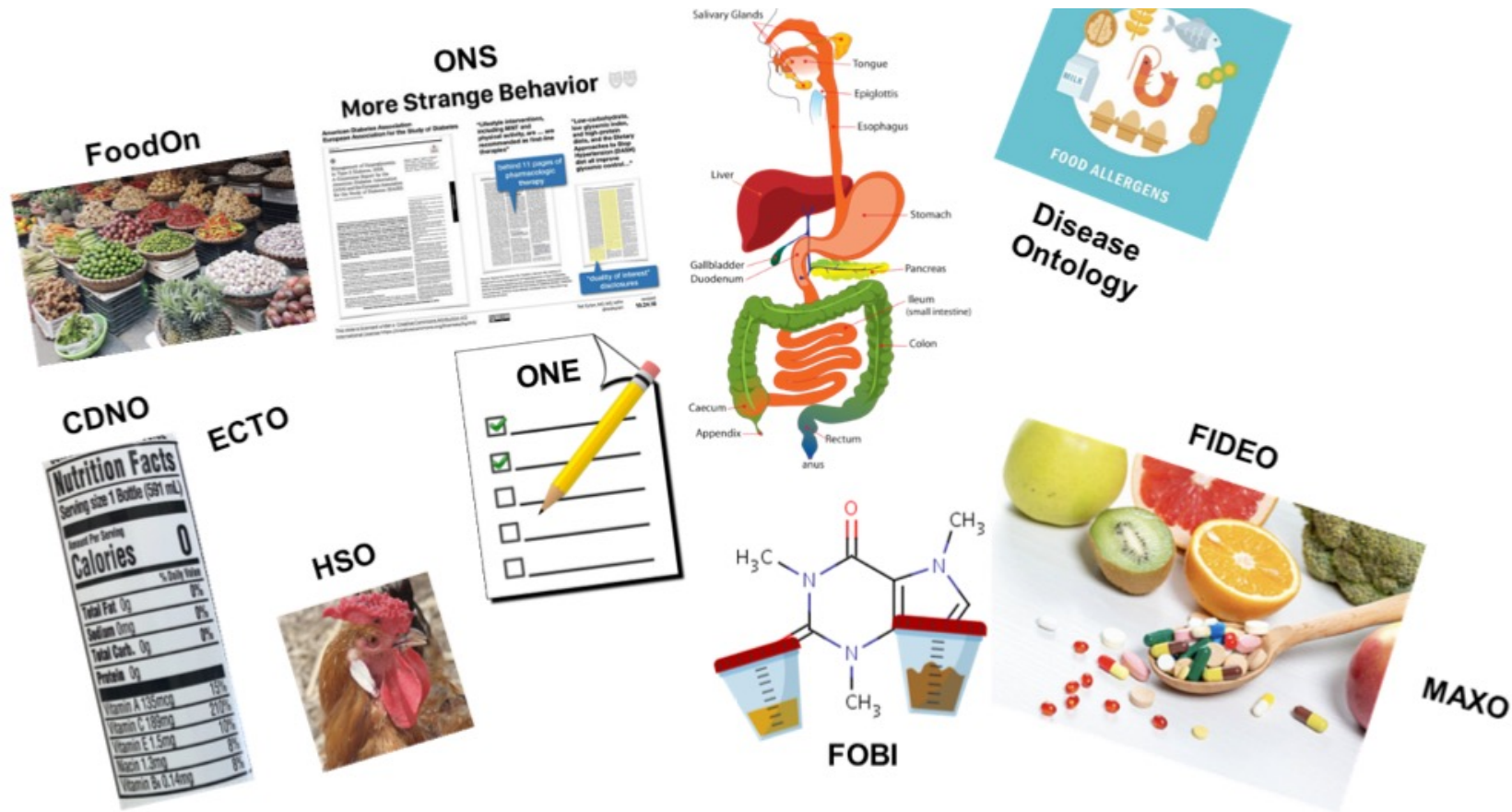


FNS ontology

- Describing metadata of samples from food intake & consumption & 'omics studies



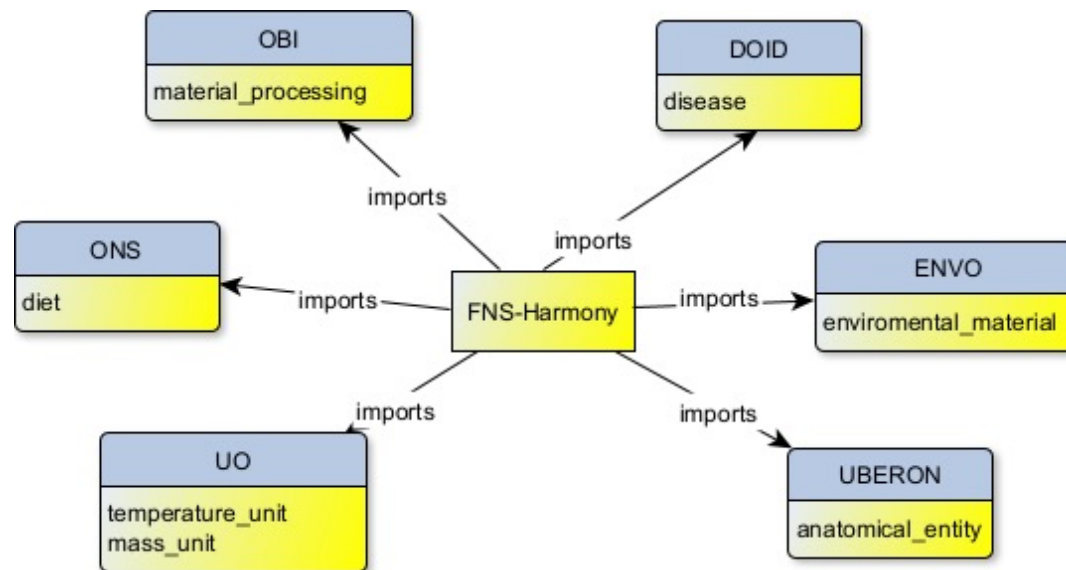
The FNS Harmony ontology



The FNS Harmony ontology

Available at: <https://github.com/panovp/FNS-Harmony>

PURL: <https://purl.org/fns-h>



FoodViz – annotation and linkage via semantic sources

FoodViz with FoodNER

Recipes

Free text FoodNER annotation

FoodNER resources

Food Onto Map Index

Food-Disease annotations

Recipes

Curated? ☒

Filter recipes

All categories ▾

0recipe1006

0recipe1013

0recipe1046

0recipe1058

0recipe106

0recipe1078

0recipe1090

0recipe1102

0recipe1110

0recipe1122

0recipe1134

0recipe1142

0recipe1166

0recipe1174

0recipe1186

0recipe1197

0recipe1218

0recipe1231

0recipe1251

0recipe1263

0recipe1271

0recipe1283


0recipe1295


Recognized Entities for recipe 0recipe1006

Mix the **cream cheese** , **beef** , **olives** , **onion** , and **Worcestershire sauce** together in a bowl until evenly blended . Keeping the mixture in the bowl , scrape it into a semi-ball shape . Cover , and refrigerate until firm , at least 2 hours . Place a large sheet of waxed paper on a flat surface . Sprinkle with **walnuts** . Roll the **cheese ball** in the **walnuts** until completely covered . Transfer the **cheese ball** to a serving plate , or rewrap with waxed paper and refrigerate until needed .

Entity tags


Entity	Synonyms	Hansard Tags	Hansard Parent	Hansard Closest	FoodOn	SnomedCT	OF
cream cheese	CREAM CHEESE	AG.01.e [Dairy produce];AG.01.e.02 [Cheese];AG.01.n [Dishes and prepared food];AG.01.n.18 [Preserve];	Dishes and prepared food	Dairy produce	cream cheese	Cream cheese Cheese Cream	
beef	BEEF	AG.01.d.03 [Beef];	Animals for food	Food		Beef	
olives	OLIVES	AG.01.h.01.e [Fruit containing stone];	Fruit and vegetables	Fruit containing stone		Olives	
onion	ONION	AG.01.h.02.e [Onion/leek/garlic];	Fruit and vegetables	Onion/leek/garlic	onion (whole) Allium cepa	Onion	of:Onion

 **FNS – Cloud**
Food Nutrition Security



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

FNS Catalogue

 **FNS - Cloud**
Food Nutrition Security

AboutTools & ServicesDatasetsNewsCommunityContactLOG IN

Home > Datasets

BROWSE DATASETS

This tool, which is an integral part of FNS-Cloud, allows to browse the collected Datasets based on the searched phrase, or by selected available Food Areas (from among the Agri-Food, Biological Activity, Food & Drug interaction, Food Intake & Lifestyle or Nutrition and Health domain). Each dataset provides general information about the dataset (description, contact data, technical details, collaboration possibilities, and other info).


1 selected

Filter

- ☐ Agri-Food
- ☐ Biological Activity
- ☐ Food & Drug Interaction
- ☐ Food Intake & Lifestyle
- ☒ Nutrition & Health
 - ☐ Biomedical data
 - ☐ Genomic Data
 - ☒ Microbiome
- ☐ Training and Education
 - ☐ Animation
 - ☐ Assessment Tool
 - ☐ Assignment
 - ☐ Case Study

SEARCHCLEAR

ADD DATASET

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SEARCHCLEAR

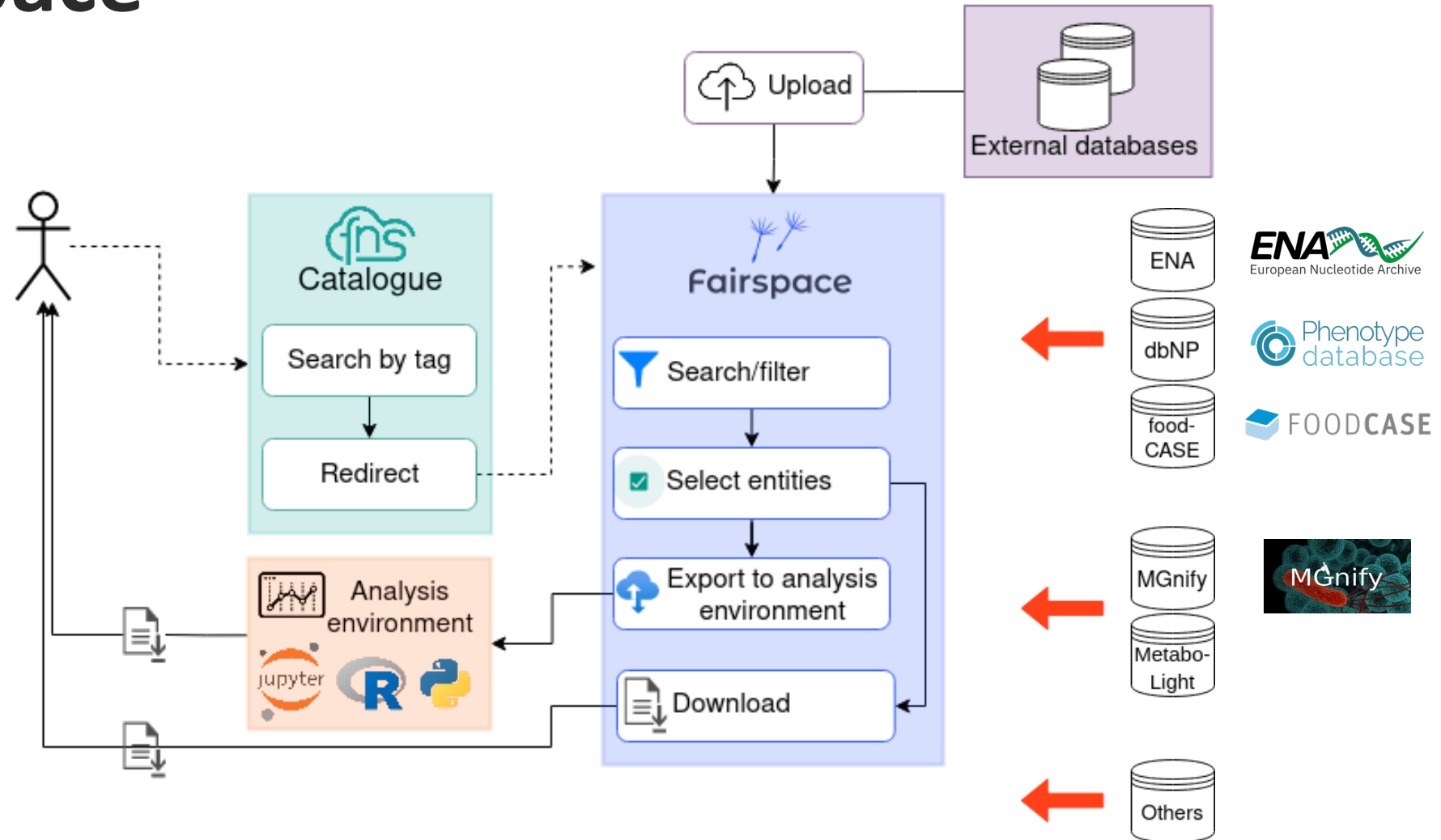
ADD DATASET

SEARCH RESULTS

Gut microbiome dataset
QIB
★★★★★ 0 (0)
Microbiome
80 metagenomic sequences files in FASTQ format and metadata located in the QIB-IRIDA
API
Fairspace

metabolomics data
QIB
★★★★★ 0 (0)
Biomarkers Biomedical data Microbiome Nutrition & Health
Excel files with multiple metabolites quantified for each study participant
Fairspace

FairSpace



Analysis environment

<

Metadata

Workspaces

Collections

Metadata

Users

JupyterHub

FNS Cloud Catalog

Tool 1

Tool 2

STUDIES

STUDIES

SUBJECTS

SAMPLES

COLLECTIONS AND FILES

Study Type

Treatment Type

Gender

(Host) species

Resource type

File created

Collection

CANCEL

APPLY FILTERS

Study	Study Type	Treatment Type	Subjects	Gender	(Host) species
ADMIT_01		water, Screening, OGTT+OLTT	ADMIT_01:Subject15, ADMIT_01:Subject9, ADMIT_01:Subject1, ADMIT_01:Subject4, A...	Female, Male	Ho
Foodmix	Interventional Study	Placebo, HFPPC, AIDM, Screening	Foodmix:18-194, Foodmix:31-165, Foodmix:35-119, Foodmix:10-118, Foodmix:04-120, ...	Male	Ho
VitC-LPS-PBMC	Interventional Study	Cultured PBMC, Vitamin C	VitC-LPS-PBMC:C2, VitC-LPS-PBMC:C1, VitC-LPS-PBMC:C5, VitC-LPS-PBMC:C3, VitC-L...	Male, Female	Ho
AIRC-ISS	Interventional Study	AA, Untreated (D), DHA	AIRC-ISS:NUD1, AIRC-ISS:NUD43, AIRC-ISS:NUD32, AIRC-ISS:NUD38, AIRC-ISS:NUD6, A...	Female, Male	Ho
SU.VI.MAX	Interventional Study		SU.VI.MAX:control440757, SU.VI.MAX:control476335, SU.VI.MAX:control507205, SU.VI...	Male, Female	Ho
dime-test		Low-bioactive, High-bioactive	dime-test:DIME_7, dime-test:DIME_5, dime-test:DIME_11, dime-test:DIME_20, dime-test...		Ho
NCT02710513	Interventional Study	Mediterranean-based functional diet	NCT02710513:HC02, NCT02710513:HC18, NCT02710513:HC16, NCT02710513:HC14, ...	Female, Male	Ho
280733			280733:DIME_002, 280733:DIME_003, 280733:DIME_001		Ho
FNScloud_demonstration			FNScloud_demonstration:F2-030U, FNScloud_demonstration:M2-04R, FNScloud_demo...		Ho
MEATIC-WP1	Interventional Study	PVD_diet, MBD_diet, MBDT_diet	MEATIC-WP1:MEA041, MEATIC-WP1:MEA010, MEATIC-WP1:MEA002, MEATIC-WP1:M...	Female, Male	Ho

Rows per page: 10 1-10 of 30 < > 1 > >|

FNS-Cloud Metadata API & submission form

FNS Cloud Metadata API ^{1.0}

[Base URL: /api/v1]
<https://api-fnscloud.scalefocus.dev/api/v1/swagger.json>

The FNS Cloud Metadata API provides access to research data from the ENA Database in a convenient format.

[Authorize](#)

Search

Query the back-end storage

>

Studies

A study (project) groups together data submitted to ENA.

>

Samples

A sample contains information about the sequenced source material. Samples are associated with checklists, which define the fields used to annotate a taxon.

Experiments

An experiment contains information about a sequencing experiment including library and instrument details

Runs

A run is part of an experiment and refers to data files containing sequence reads.


Ontologies

Provides information about entries of a specific ontology, e.g. ENVO, ONS, OBI, DOID, etc.

User

User related operations

Models

 **FNS - Cloud**
Food Nutrition Security

METADATA SUBMISSION
You are logged in as:
sf-test@scalefocus.com!
[LOG OUT](#) [GO TO API](#)

Submission using ENA accession key [?]

ENA ACCESSION KEY

[SUBMIT](#)

Submission using the submission form [?]

STUDY TITLE

STUDY TYPE

CONTACT INFORMATION

[NEW SAMPLE](#)


[ADD STUDY](#)

Submission using a spreadsheet [?]

[DOWNLOAD TEMPLATE](#)

Choose File

[UPLOAD STUDY](#)



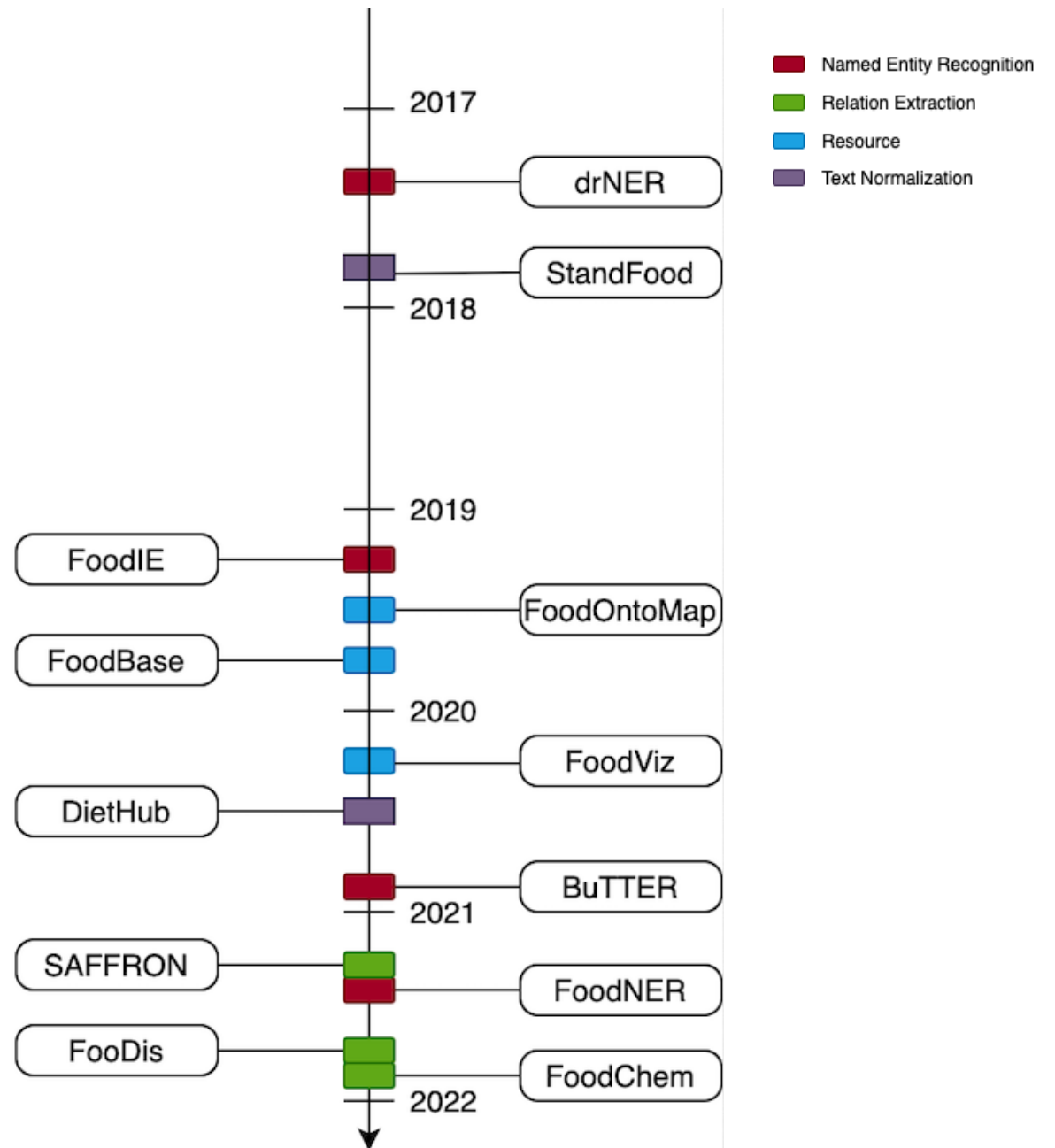
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References



- Tome Eftimov
- Gjorgjina Cenikj
- Gordana Ispirova
- Barbara Koroušić Seljak

More at: <https://www.fns-cloud.eu/outputs/publications/>



Thank you for your attention

- Team work:
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 - University of Florence
 - The Hyve
 - ScaleFocus
 - University of Maastricht
 - Premotec

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