

14TH INTERNATIONAL FOOD DATA CONFERENCE

Food composition databases: application for healthy diets and sustainable agrifood systems transformation
1–3 September 2025, Rome, Italy

**Approach and Resources for the Sustainable Update of the Portuguese Food Composition Database:
A Multi-Source and Collaborative Strategy**

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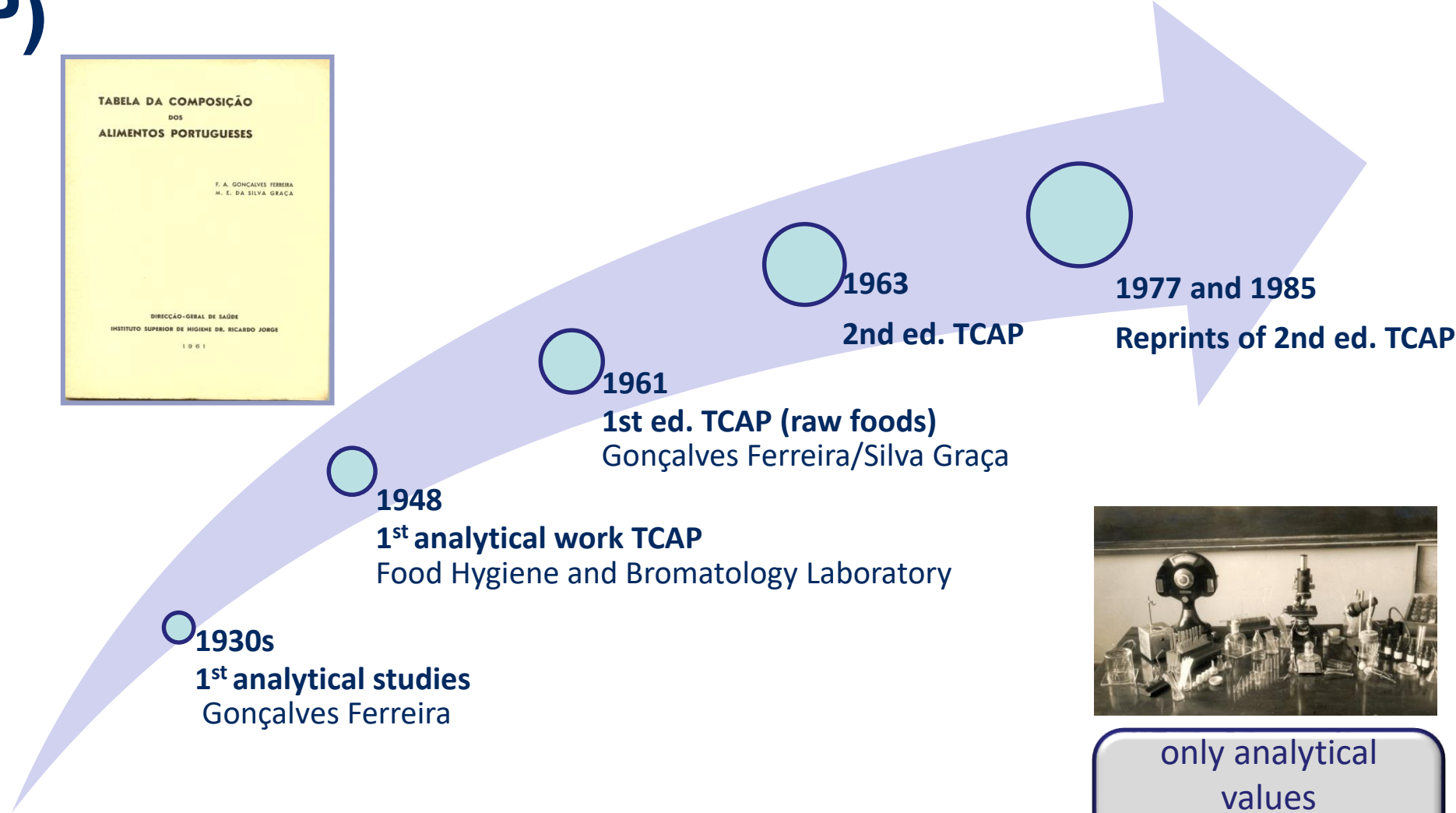
Why Food Composition Matters

- “Tell me what you eat, and I will tell you what you are.” — Jean Anthelme Brillat-Savarin (1825)



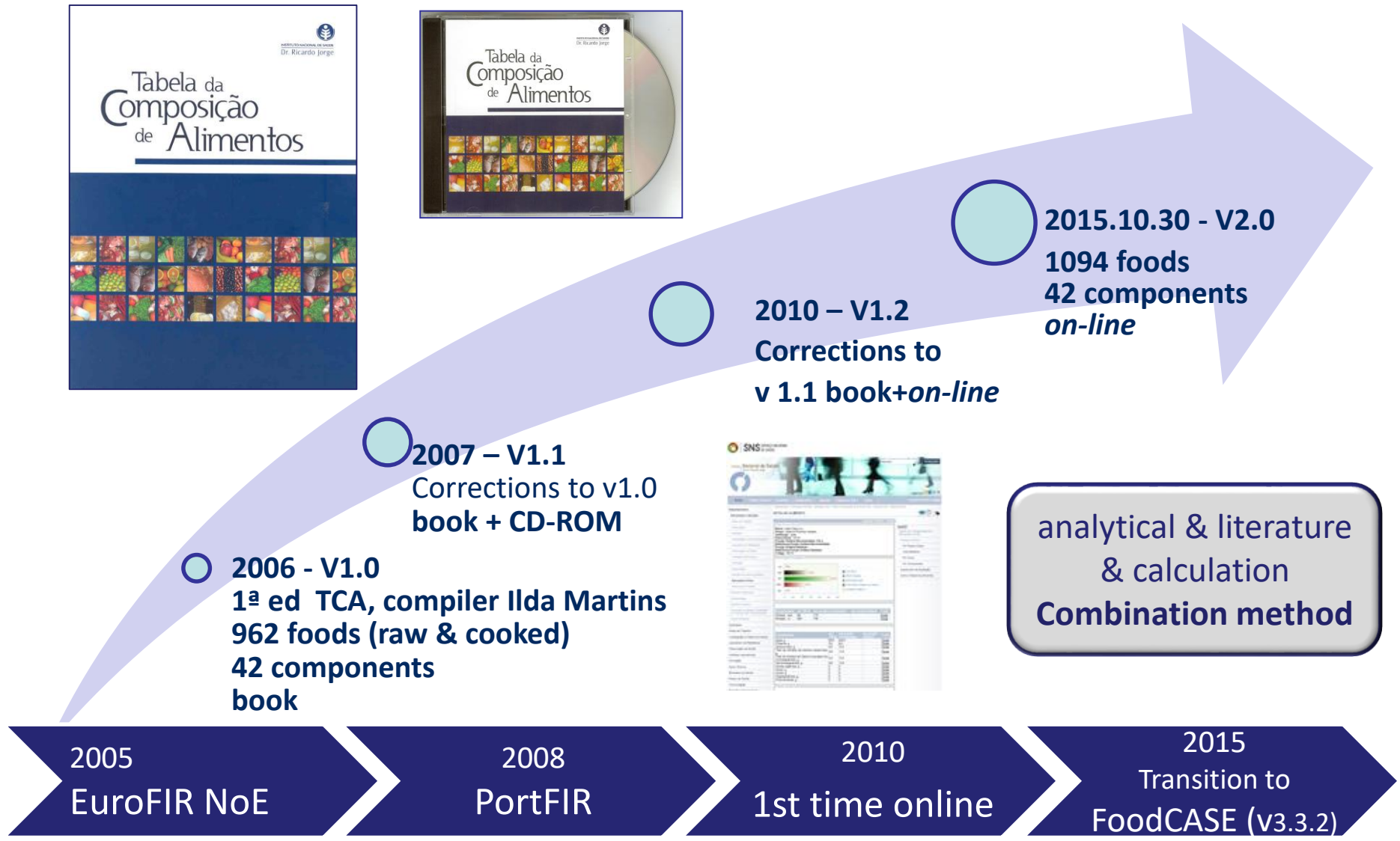
- “A knowledge of the chemical composition of foods is the first essential in the dietary treatment of disease or in any quantitative study of human nutrition.” — McCance & Widdowson (1940)
- “Food data is the backbone of nutritional science.” — EuroFIR principles (2005-2010)

Portuguese FCDB: A Long-Term Commitment (TCAP)

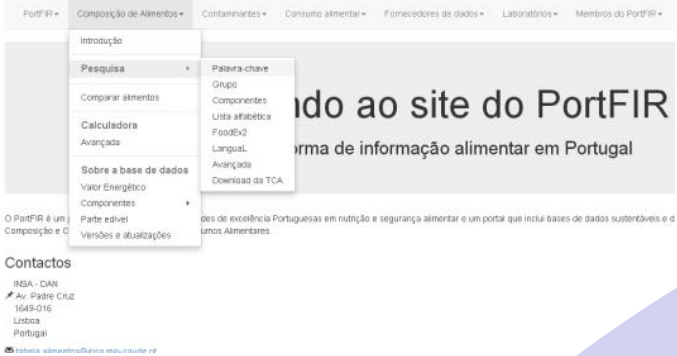


only analytical values
Direct method

Portuguese FCDB: A Long-Term Commitment (TCA)



Portuguese FCDB: A Long-Term Commitment (TCA, PorFIR site)



2016 – TCA v2.1
1109 foods
42 components
on-line
Pdf, Excel®
Site PortFIR



2018 – TCA v3.0-3.2
1164 foods
42 components

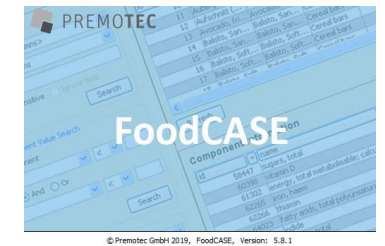
2019 – TCA v4.0
≈1350 foods



2021 – TCA v5.0
≈1307 foods

2023 – TCA v6.0
1330 foods
44 components

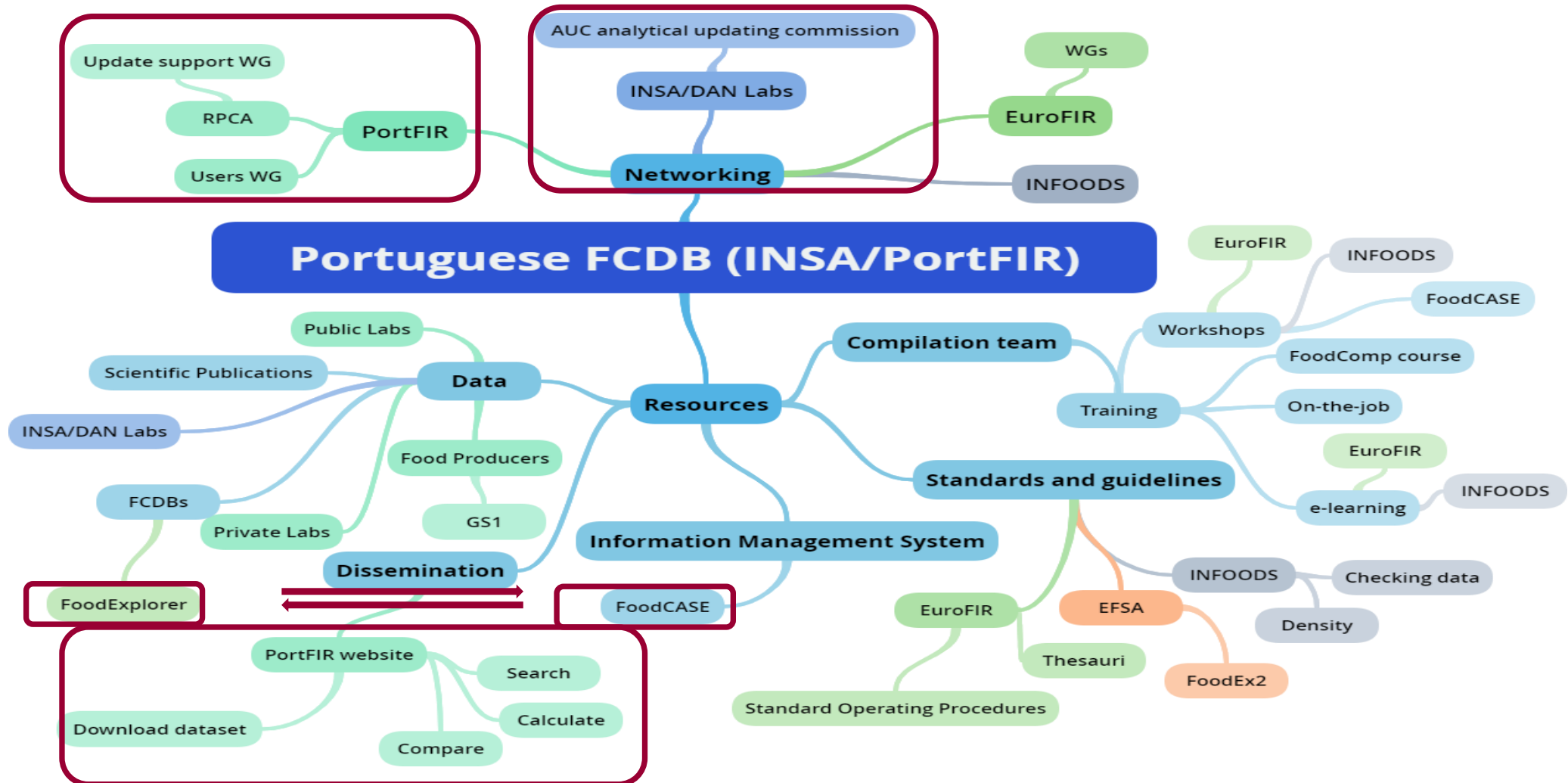
2025 – TCAv.7.0
50 components
To be released
September



FoodCASE version 8.7.0
2025

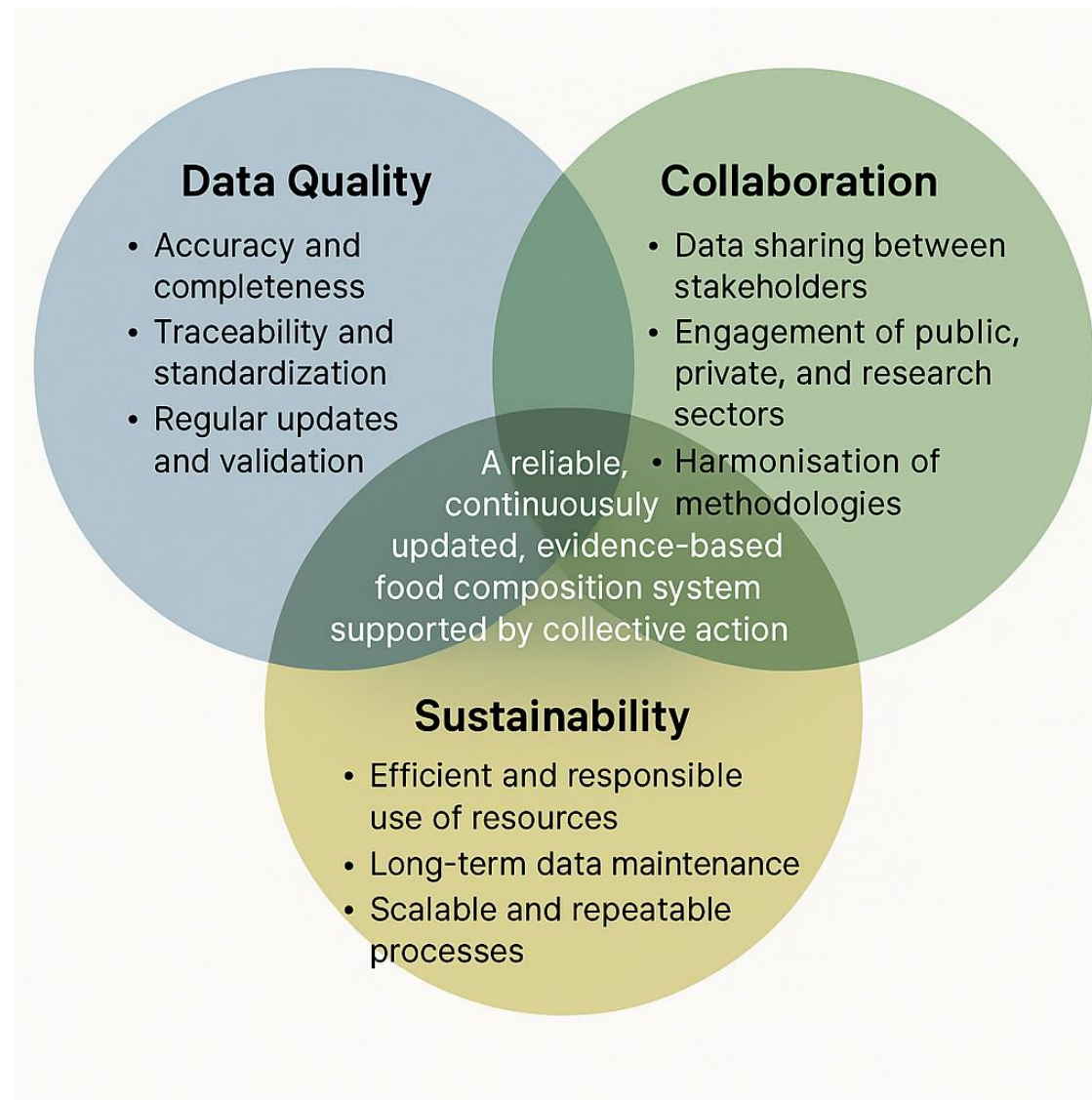


The Portuguese Food Composition Database Framework



What We Aim to Achieve?

- Provide reliable and updated nutrient data
- Ensure sustainability through multi-source integration
- Respond to user needs and public health goals



Analytical Data Collection

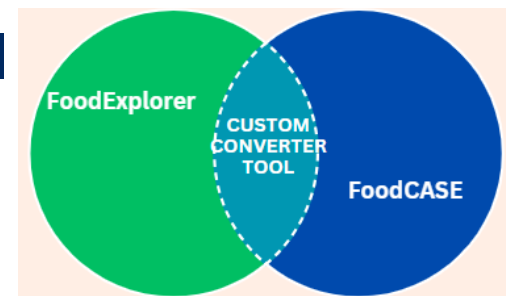
The Core: Annual Analytical Programme

- 12–22 pooled food samples analysed per year;
- Conducted using ISO/IEC 17025 procedures accredited in our lab;
- Regular update of FCDB coordinated by the Analytical Updating Commission (AUC):
 - Identify and prioritises the list of foods and nutrients to analyse; Define the sampling plan; Create the analytical schedule; Monitor overall execution of the work plan; Implement corrective actions (if appropriate); Organize, validate and report analytical results to compilers.

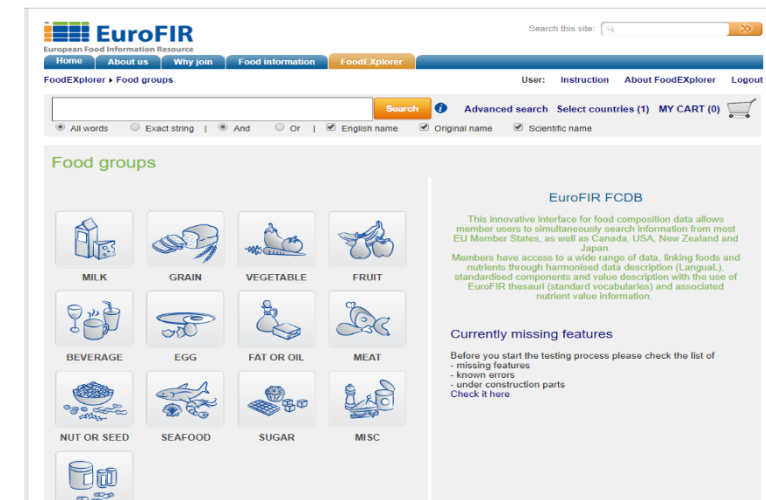


Integration of Other Sources A Multi-Source Strategy

- Total Diet Study (TDS) **tds ► exposure** :164 samples analysed
- Industry and retail data collected via GTTCA
- Additional data from EuroFIR (FoodExplorer), food labels, and international databases
 - Data export - Converter custom tool
 - Cleaning
 - Correction
- Recipe calculation



<http://www.eurofir.org/foodexplorer/>



Digital Infrastructure

FoodCASE: A Key Technical Asset



- Supports FCDB structure and metadata management
- Ensures EuroFIR compliance
- Consistency is ensured through automated checks using team-defined rules, complemented by occasional manual spot checks.

FoodCASE						
Composition		TDS	Consumption Data	Recipes		
Name	Food Group	Energy	Protein	Fat	Carbohydrat	
, raw	Fruits	52	0.3	0.3	0	
teak, grilled	Meat and meat products	143	1,0	0.7	0.5	
t, boiled	Vegetables and vegetable	12,7	0,9	0.3	1,6	
ldar cheese	Milk and dairy products	51	3,4	1,8	2	
en breast, roasted	Chicken breast, roasted	12,8	2,3	0,4	0,5	
ce, raw	Lettuce, raw	5,1	3,3	0,6	0,5	
on, grilled	Salmon, grilled	58	5,0	1,9	1,0	
e bread	White bread	743	0,3	0,3	0,7	

General Info		Nutrient values	References	Audit Trail	
Apple, raw		Nutrient Values			
Energy	Value	Nutrient		Value	
Energy	52 kcal	Energy		kcal	
Protein	0,3 g	Protein		0.3 g	
		Fat		0 g	
		Carbohydrate		0 mg	
		Unit		Imporel	

What's New in 2025

Updates in the Upcoming FCDB Release

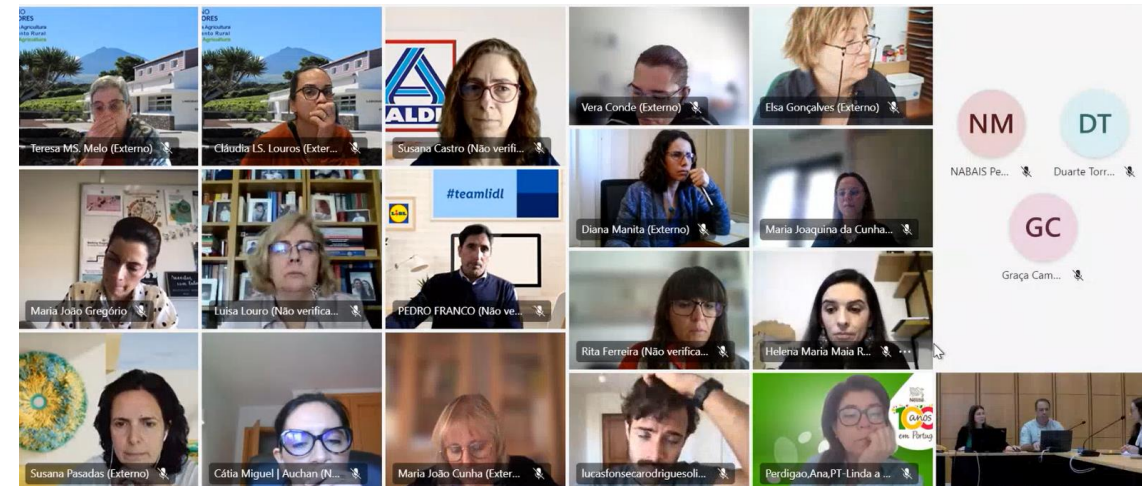
- New food items and components included
 - α -carotene; β -carotene; β -cryptoxanthin; lutein; lycopene; zeaxanthin
- Major revisions for salt and sugar values (aligned with reformulation policy)
 - In Portugal, over five years, a collaborative effort between health authorities, the food industry, retail sector, and a market research company led to a reduction of 15% in salt (18 t) and 21% in sugar (7,433 t) in the most significant food groups.
- 58% of TDS samples integrated based on suitability

Role of Stakeholders

Collaborative Governance Through GTTCA



- PortFIR Programme; Networks; working groups;
 - Annual meeting;
- 74 members from academia, industry, and public health;
 - State laboratories; Universities; Research centres; Health authorities; Inspection authorities; Legislators & regulators; Private Enterprises – industry and distribution; Agro-food sector organisations;
- Bimonthly meetings to align data needs and contributions;
- Critical to revision and Transparency.

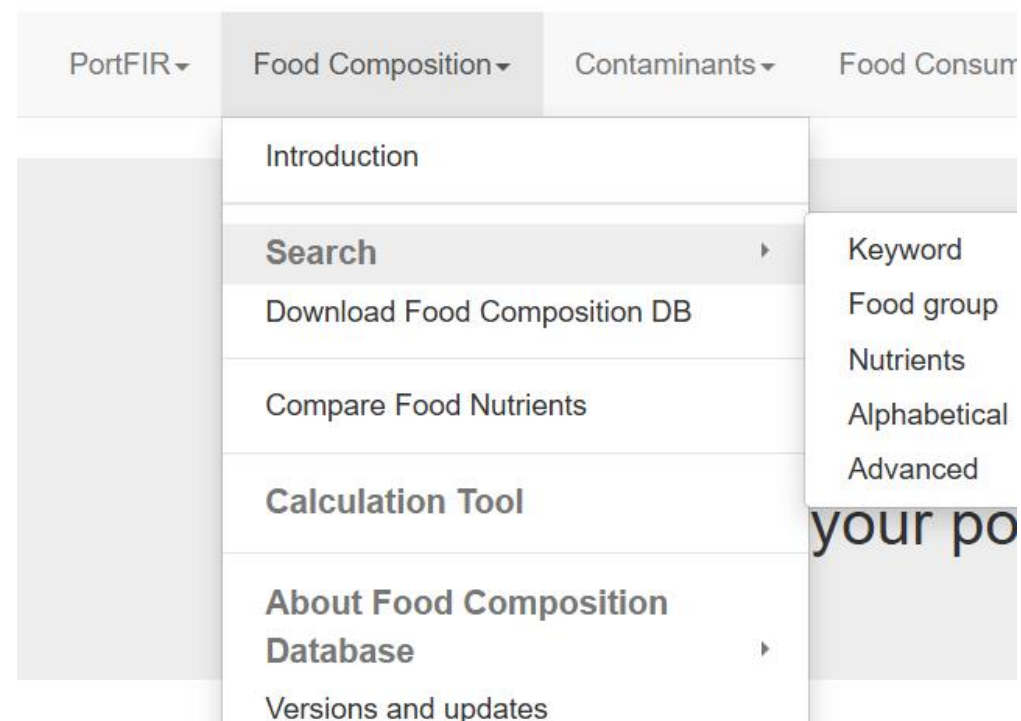


Public Access & Dissemination

PortFIR Website: Serving All Users

<https://portfir-insa.min-saude.pt/>

- Free access to the FCDB
- Comparison tool, recipe calculator, and dataset download
- Key channel for transparency and public service



Food Composition Database – Excel®

FoodEx2 Classification until level 3

Cod	Nome do alimento	Nível 1	Nível 2	Nível 3	Energia [kcal]	Energia [kJ]	Lípidos [g]	Ácidos gordos saturados [g]
735	Licor simples	Bebidas alcoólicas	Bebidas espirituosas não açucarada	Licores	294	1230	0	0
190000096	Lima	Frutos e produtos derivados de frutos	Fruta utilizada como fruta	Frutos cítricos	31	132	0,2	0
661	Limão	Frutos e produtos derivados de frutos	Fruta utilizada como fruta	Frutos cítricos	31	130	0,3	0,1
190000008	Língua de porco crua	Carne e produtos cárneos	Outros produtos do abate de anima	Outros produtos do abate de mar	220	914	17,2	6
330	Língua de vaca, crua	Carne e produtos cárneos	Outros produtos do abate de anima	Outros produtos do abate de mar	199	825	15	5,7
331	Língua de vaca, estufada, s	Pratos compostos	Pratos, incl. refeições prontas a com	Pratos, excluindo pratos de mass	267	1110	20,9	8
845	Linguado cru	Peixes, mariscos, anfíbios, répteis e invertebrados	Peixe (músculo)	Peixe de mar	82	349	0,2	0
847	Linguado frito	Peixes, mariscos, anfíbios, répteis e invertebrados	Peixe (músculo)	Peixe de mar	164	689	6,2	0,7
846	Linguado grelhado	Peixes, mariscos, anfíbios, répteis e invertebrados	Peixe (músculo)	Peixe de mar	94	400	0,2	0
349	Linguiça	Carne e produtos cárneos	Enchidos	Enchidos preservados ou parcialn	437	1810	39	13,4
70204048	Lombo de porco assado	Carne e produtos cárneos	Carne de mamíferos e de aves	Carne de mamíferos	220	921	11,3	2,8
187	Lombo de porco assado co	Carne e produtos cárneos	Carne de mamíferos e de aves	Carne de mamíferos	219	916	11,1	3,6

Food Composition Data Base Comparison Tool



Code	Food Name	energy kcal, total metabolisable [kcal]	energy kJ, total metabolisable [kJ]	fat, total [g]	fatty acids, total saturated [g]	fatty acids, total monounsaturated [g]	fatty acids, total polyunsaturated [g]	fatty acid 18:2 n-6 cis,cis [g]	fatty acids, total trans [g]	carbohydrate [g]	sugars, total [g]	sucrose [g]	lactose [g]	salt [g]	oligosaccharides, available [g]	fibre, total dietary [g]	starch, total [g]	protein, total [g]	alcohol [g]	water [g]	organic acids	ch
IS579	Pumpkin, raw	11	47	0.2	0.1	0	0	0	0	1.7	1.4	0.3	0	0.0	0	0.7	0.3	0.3	0	96.6	0	0
IS595	Beetroot, raw	23	97	0	0	0	0	0	0	3.5	3.5	3.1	0	0.2	0	2.6	0	1	0	92.4	0	0
IS600	Carrot, raw	25	106	0	0	0	0	0	0	4.4	4.1	1.7	0	0.1	0.1	2.6	0.2	0.6	0	92	0	0
IS621	Courgette, raw	19	80	0.3	0.1	0	0.1	0.1	0	2	1.9	0.8	0	0.0	0	1	0.1	1.6	0	94	0	0

Food Composition Data Base – Calculation tool



1. COMPOSE DIET 2. DAILY DIET OVE

1. COMPOSE DIET 2. DAILY DIET OVERVIEW

9:00 AM Breakfast TOTAL DIET

Search for ingredients

- Available ingredients
- Beef, steak, a minute with butter +
 - Beef, steak, fried in butter +
 - Beef, steak with fried egg with butter +
 - Biscuits, butter +
 - Butter, salted +
 - Butter, unsalted +
 - Eggs, chicken, fried in butter +
 - Eggs, chicken, scrambled with butter +

User's recipes Create recipe

DIET PLAN

9:00 AM Breakfast (for 1 person(s))

Milk, skimmed, UHT

Amount:

Coffee, infusion, "bica" (3 brands)

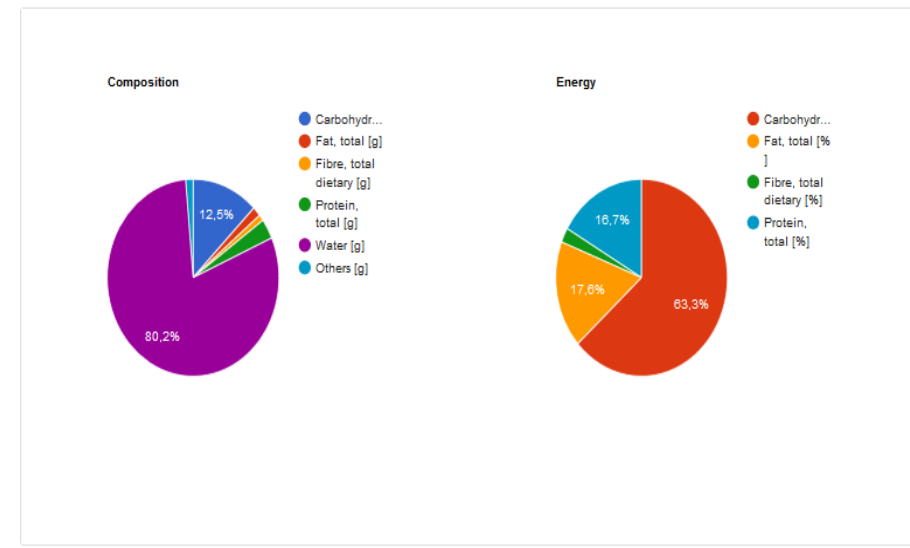
Amount:

Bread, rye

Amount:

Butter, salted

Amount:



MEALS

	MEAL TIME	Amount	Unit
Milk, skimmed, UHT	9:00 AM	200.00	g
Coffee, infusion, "bica" (3 brands)	9:00 AM	50.00	g
Bread, rye	9:00 AM	50.00	g
Butter, salted	9:00 AM	5.00	g

Components + Expand all nutrients

	Total value	Unit	Daily recommendation	Percentage of daily recommendation
▶ Energy value				
▼ Macro nutrients				
▶ Lipids	4.88	g	70	7%
▶ Carbohydrates	38.13	g	260	15%

Challenges

What's Limiting Progress?

- Lack of dedicated funding from the Ministry of Health
- Analytical program relies on short-term resources
- Risk to long-term sustainability



Final Reflections

Conclusion: A Sustainable Path Forward



- A collaborative and data-driven model works
- National relevance and scientific robustness maintained
- Investment is essential for the future

“Without data, you’re just another person with an opinion.”
W. Edwards Deming (20th century)

“Food composition data are fundamental to virtually all aspects of nutrition — from assessing individual diets to formulating public health policies.”
Barbara Burlingame (21st century)





Thank You!

Questions? Comments?

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