AFRAF WEBINAR Series

AFRAF26 WEBINAR 2

GFoRSS Global Food Regulatory Science Society

Food Occurrence Data Systems: From Repository Design to Risk Assessment Applications

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23 April 2026

Outline

1. **Food Occurrence Data repositories:** Key Requirements
2. **The GEMS/Food Template**
3. **National/Regional Food Occurrence Databases**
4. **From Design to Use:** Demonstration of a Food Occurrence Database
5. **From Data to Risk Assessment:** Use of Data in Dietary Exposure Assessment
6. **Conclusion**

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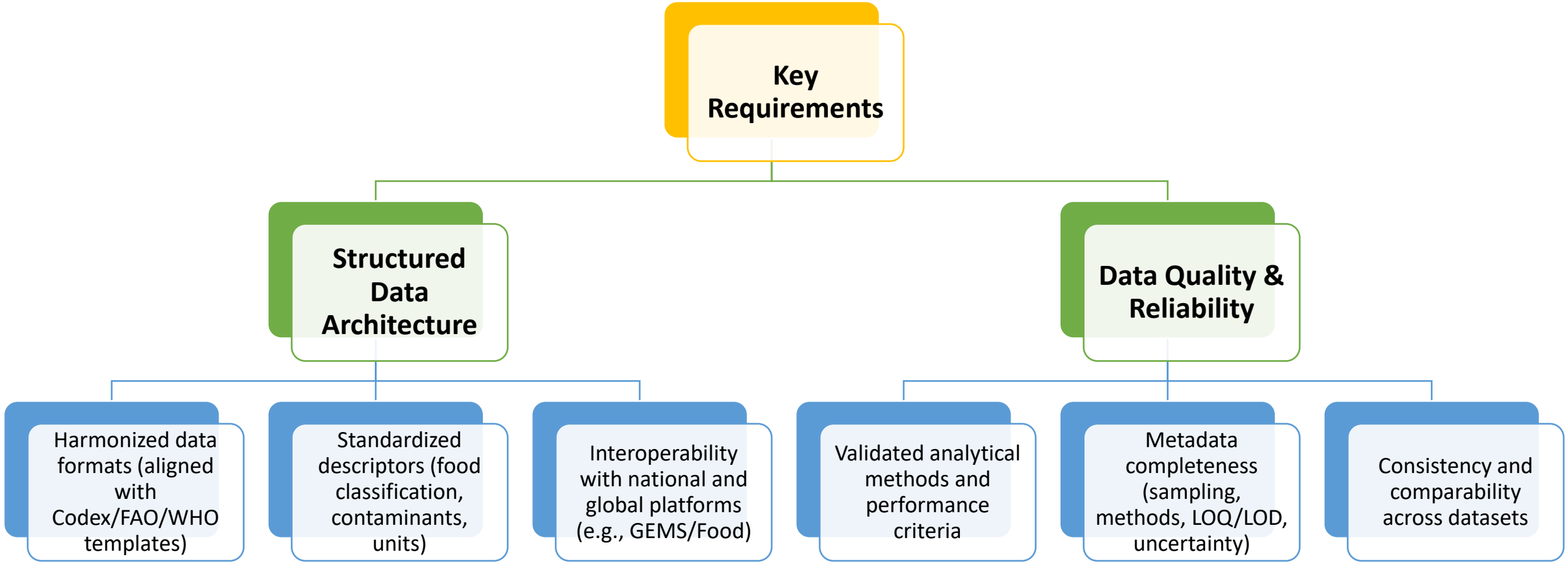
Food Occurrence Data repositories: Key Requirements

Ensure that food occurrence data systems effectively support **risk assessment** and **international data calls**



Food Occurrence Data repositories: Key Requirements

Key Requirements

Transparency & Traceability

- Clear documentation of data sources and methodologies
- Version control and audit trails
- Accessibility of metadata for review and validation

Governance & Data Sharing

- Defined ownership and data stewardship frameworks
- Clear policies for data access, confidentiality, and use
- Alignment with international data-sharing principles

Fitness for Purpose: Responding to Data Calls

- Ability to rapidly filter, extract, and format datasets
- Compatibility with FAO/WHO submission requirements
- Readiness to support JECFA and ad hoc expert consultations

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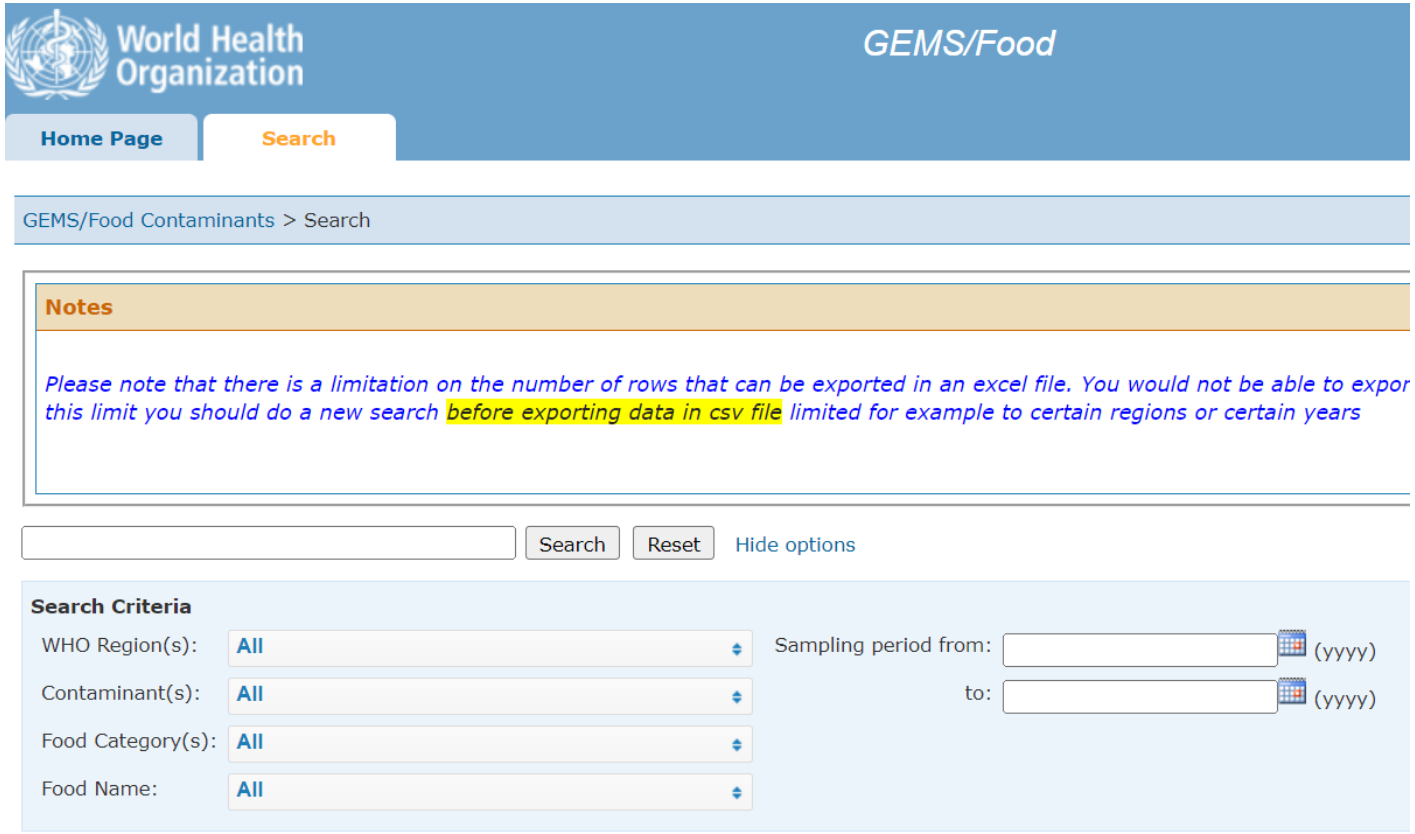
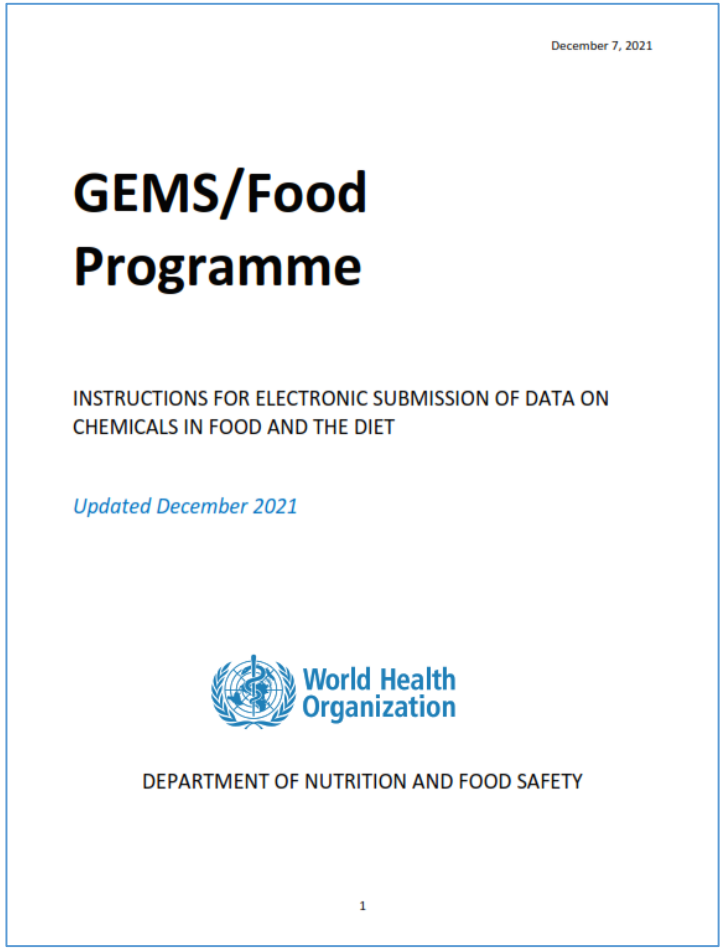
GEMS/Food Database: Introduction

The GEMS/ Food Database is a **web-based system** to access and submit data on contaminants levels in foods.





https://www.who.int/teams/nutrition-and-food-safety/databases/global-environment-monitoring-system-food-contamination

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Registration and Login

REGISTRATION AND LOGIN

1. **Data providers** should first register and create a WHO login (e-mail address) and password (e-mail should be sent to gems_food@who.int).

2. **The institution** owning the data should provide the GEMS/Food administrator with contact details to have it listed as a collaborating institution.

3. Once logged in to the database, the user will have access to the **Excel templates** for contributing data, that allow data providers to enter the national food classification and to map it with the WHO and/or the FoodEx2 classifications.

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World Health Organization

Food Mapping

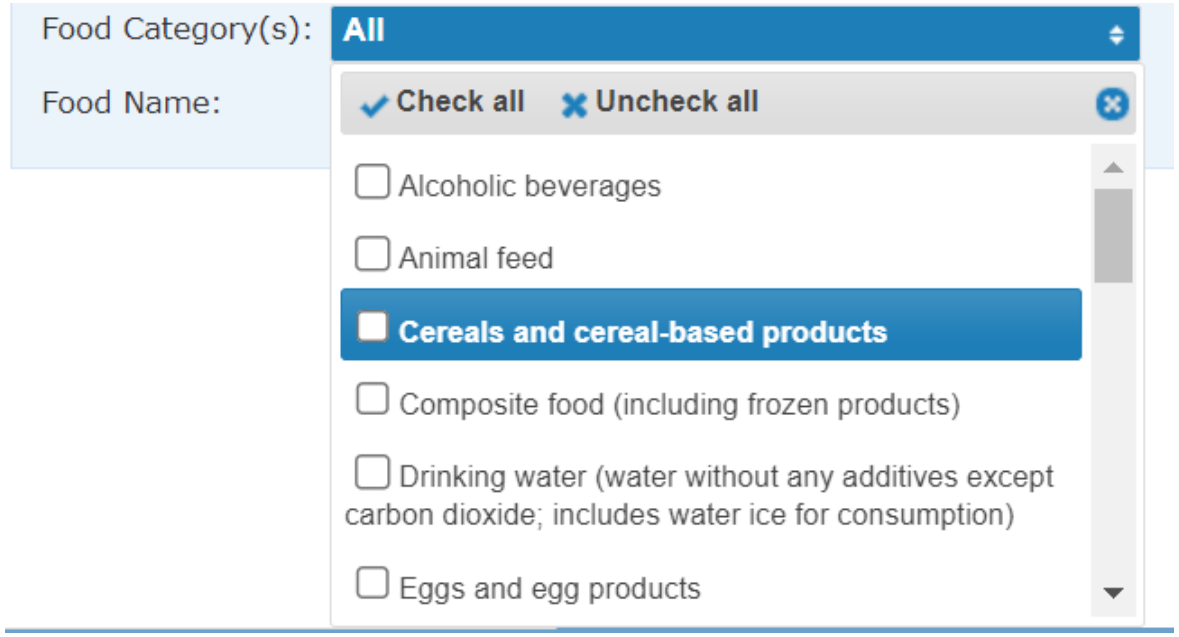
- The **national classification** should be mapped with either the WHO or the FoodEx2 classification (The **local food identifier** consists of the name given to the food in the national database).

- The GEMS/Food code is based on a hierarchical classification with **2 levels:**

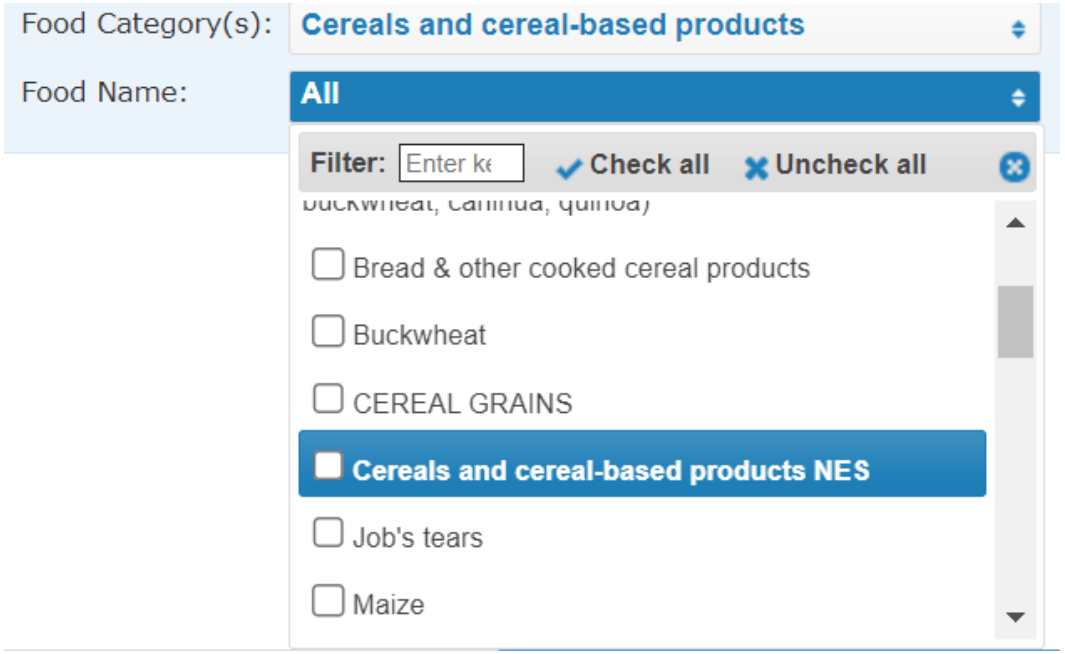
  - The first level (**WHO Food Group**) corresponds to 23 broad categories usually reported in food consumption surveys plus one category for feed.
  - The second level (**WHO Food Identifier**) corresponds to the detailed food descriptors used in the Codex Alimentarius Committees and to foods, processed or not, and analyzed as purchased or as consumed.

- The FoodEx2 code developed by EFSA and recommended for dietary exposure assessment **is already mapped with the WHO code**.

Food Mapping



If no information on the detailed food category (e.g., "fruit") select a WHO Food Identifier similar to the WHO Food Group (e.g., Fruit and fruit product NES).



If the precise food name is not listed, the more generic sub-group listed in CAPITALS should be chosen.

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Current fields in GEMS/Food template

Column	Field	Field type /Drop-down menu	Mandatory or Optional
E	Local Food Identifier	Free text	Mandatory
F	Serial no of the Record	Free text	Mandatory
G	Submitting Country/Region/Observer	Drop-down menu • (List of countries, regions, observers) • Unspecified	Mandatory
H	Contaminant	Drop-down menu • (List of contaminants)	Optional
I	Food Origin	Drop-down menu • Domestic • Imported • Mixed origin • Unknown	Optional
J	Sampling Date	Free text (YYYY)	Mandatory
K	Sample representative-ness	Drop-down menu • Random (routine) sampling • Targeted sampling • Unknown	Mandatory
L	Laboratory Identification	Free text	Optional

Column	Field	Field type /Drop-down menu	Mandatory or Optional
M	Analytical Quality Assurance	Drop-down menu • Internal quality assurance and reference standards only. • Successful participation in relevant proficiency tests/interlaboratory comparisons during the sampling and analysis period. • Official accreditation for the relevant methods during the sampling and analysis period. • Unknown quality assurance of the lab.	Optional
N	Measurement units for Contaminant Levels	Drop-down menu • mg/kg • µg/kg • ng/kg • pg/kg • Bq/kg	Mandatory
O	LOD	Free text	Mandatory for results not quantified (i.e., non-detect) if LOQ is not provided. (Optional)
P	LOQ	Free text	Mandatory for results not quantified if LOD is not provided. (Mandatory)

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Current fields in GEMS/Food template

Column	Field	Field type /Drop-down menu	Mandatory or Optional
Q	Results based on	Drop-down menu • Fat content • Dry weight • As is (raw, fresh, as sold) • As consumed	Mandatory
R	Portion analyzed	Drop-down menu • Edible only • Whole food (edible + inedible)	Mandatory
S	State of food analyzed (Cooked/Raw)	Drop-down menu • Cooked • Raw • Unknown	Optional
T	Results	Free text	Mandatory
U	Individual vs Aggregated data	Drop-down menu • Individual • Aggregated	Mandatory
V	Confidentiality of Data	Drop-down menu • Yes • Blank	Optional
W	Remarks/References	Free text	Optional
X	Year of production/harvest	Free text (YYYY)	Optional
Y	Compositional information	Free text	Optional
Z-1	Country/Region of Production of Finished Product	Menu • Unknown • Countries/Regions (A-Z)	Optional

Column	Field	Field type /Drop-down menu	Mandatory or Optional
Z-2	Country/Region of Origin of Raw Materials	Menu • Unknown • Countries/Regions (A-Z)	Optional
AA	Product type	Menu: • Destined for further processing • Ready to eat • Not applicable • Unknown	Optional
BB	Sampling location in production chain	Menu: • Unknown • Production site • Bulk lot transport • Border (import/export) • Market/Retail • Other	Mandatory
CC	Principle of method of analysis	Menu • Method A • Method B • Method Z • Other • Unknown	Optional

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GEMS/Food Database

World Health Organization

GEMS/Food

Feedback | Login | Search

Home Page | Search

GEMS/Food Contaminants > Search

Search Criteria

WHO Region(s): All

Contaminant(s): Abamectin

Food Category(s): Fruit and fruit products

Food Name: Avocado

Sampling period from: (yyyy)

to: (yyyy)

Search Results Export to file (csv) | Print | Get link to this search | Email this search

Record Type	Region	Contaminant	Food Group	WHO Food Identifier	WHO Food Code	State of food analysed	Result	Units	LOD	LOQ	Year Sample	Sample representativeness (or reliability)	Lab identification	Food origin	Analytical quality assurance	Results based on
Individual	PAHO	Abamectin	Fruit and fruit products	Avocado	FI 0326	Raw	ND	mg/kg	0.01	0.011	2015	Random sampling	8	Imported	Officially accredited	As is
Individual	PAHO	Abamectin	Fruit and fruit products	Avocado	FI 0326	Raw	ND	mg/kg	0.01	0.011	2015	Random sampling	8	Imported	Officially accredited	As is
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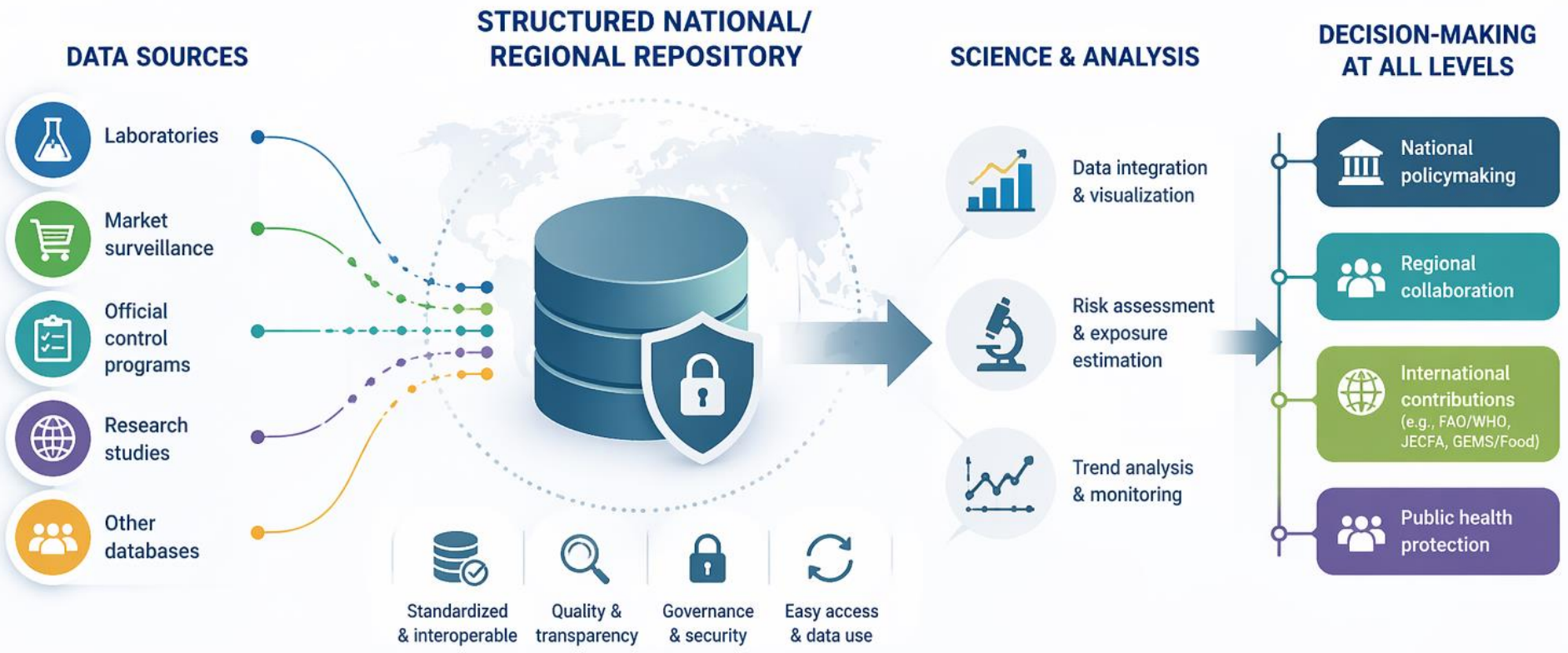
National/Regional Food Occurrence Databases

A structured national/regional repository is not just a database.
It is a strategic tool to connect data, science, and decision-making at all levels.



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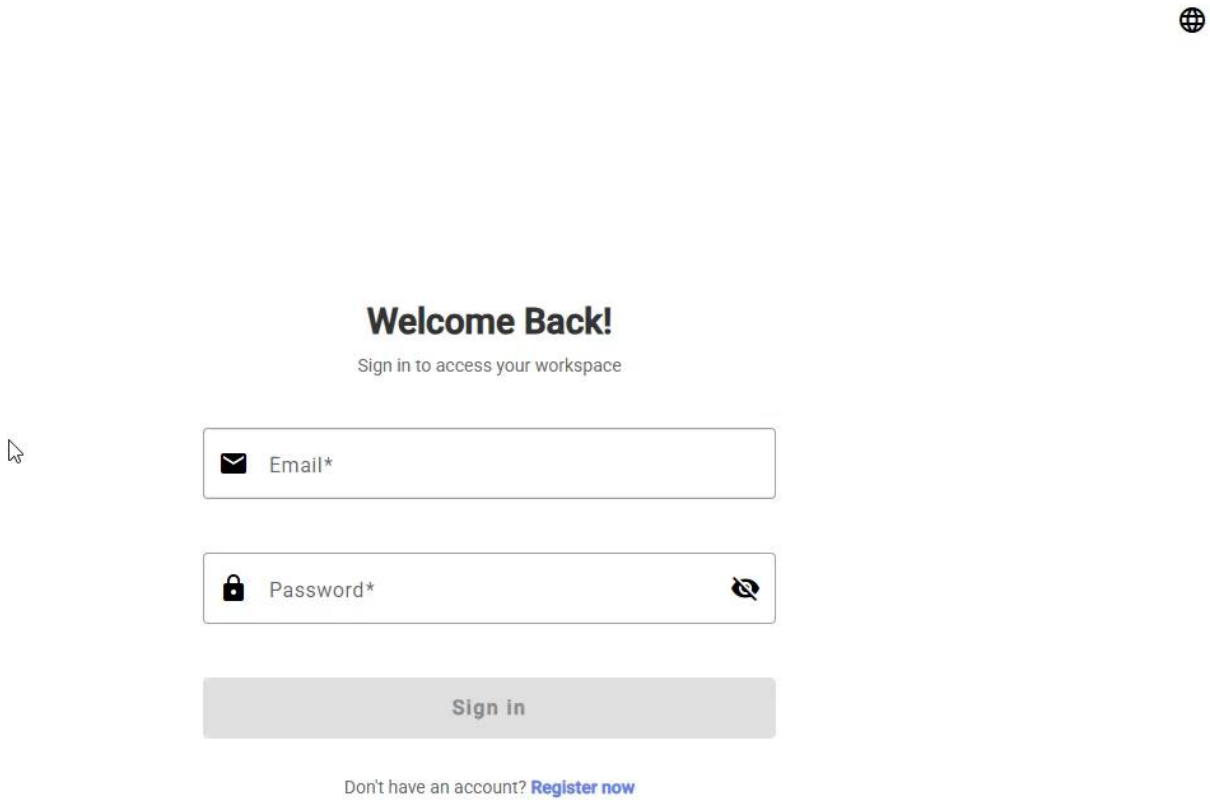
From Design to Use: Demonstration of a Food Occurrence Database



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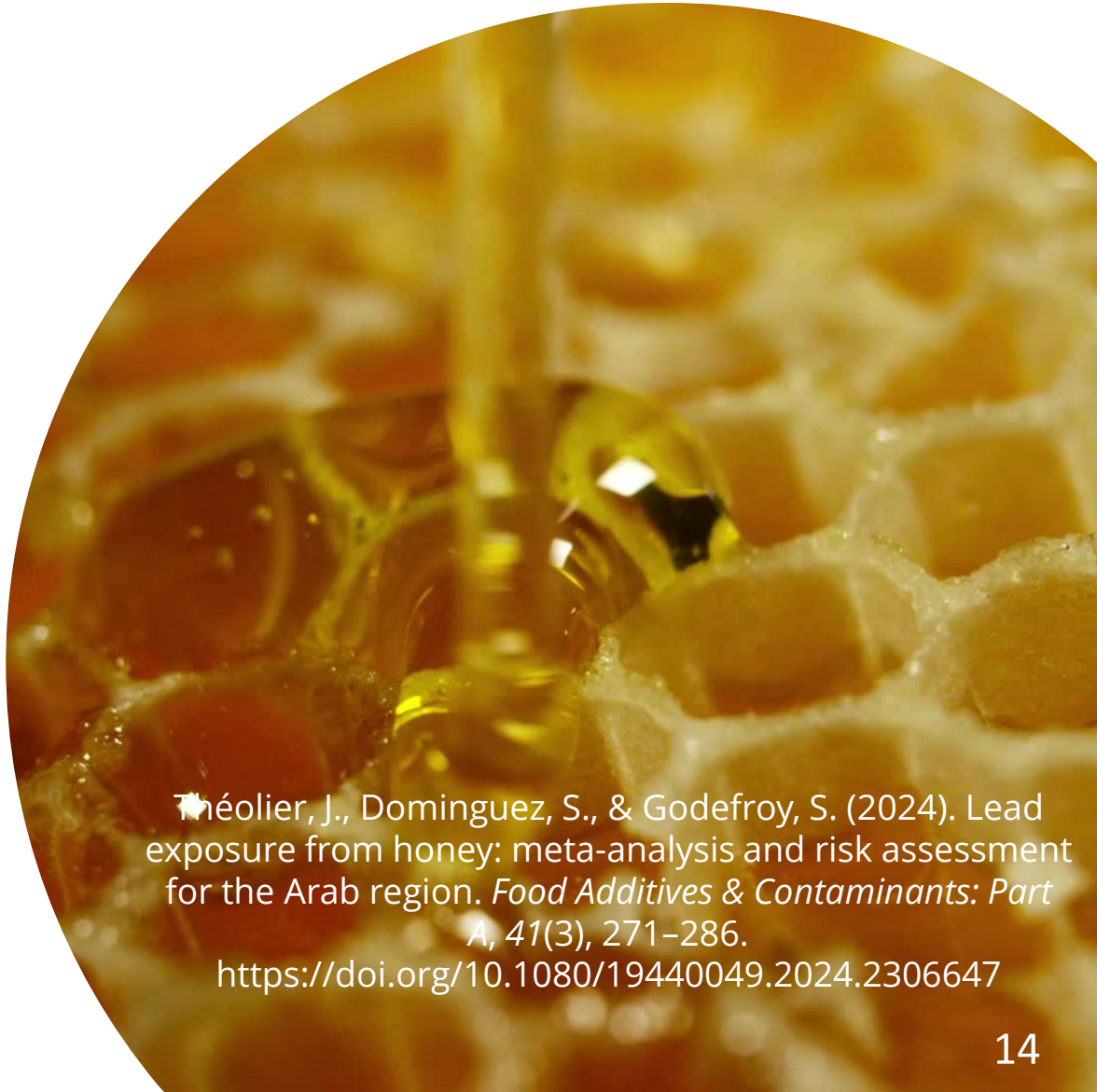
Lead exposure from honey: risk assessment for the Arab region

- The Codex Committee on Contaminants in Food recommended the adoption of a maximum level (ML) of 0.1 mg/kg for lead (Pb) in honey, which was adopted by the Codex Alimentarius Commission (CAC 2022).

- It is very likely that various food regulatory jurisdictions will follow this course of action by adopting this ML.

- The development of the Codex ML was based on the analysis of the GEMS data, based on data from a limited number of countries. Notably, the GEMS database does not include data for Pb in honey from the Middle East/North Africa (MENA) region and the various Arab states.

- **The aim of this work was to collect published analytical data for Pb in honey available from Arab countries and to assess the risk caused by exposure to Pb from these samples for local consumers.**



Théolier, J., Dominguez, S., & Godefroy, S. (2024). Lead exposure from honey: meta-analysis and risk assessment for the Arab region. *Food Additives & Contaminants: Part A*, *41*(3), 271–286. https://doi.org/10.1080/19440049.2024.2306647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