

# **MINIMUM REPORTING REQUIREMENT FOR FOOD COMPOSITION DATA**

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# The Importance of Food Composition Databases (FCDBs)

“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).

FCDBs are a key pillar in the health infrastructure.

$\text{Diet} = \text{food consumed (survey)} \times \text{food composition}$

**Not enough attention given to the importance of FCDBs. Data are used extensively in many other fields.**

FCDBs for:

Research (epidemiology, diet and nutritional status)

Public health and education (guidelines)

Diet planning (personal, institutional, research)

EPA for pesticides

Nutrition policy

Food manufacturing

Consumer information

# Minimum Reporting Requirements

- The least amount of information that is acceptable in a paper submitted for publication.
- Since data reported in scientific journals are a major source for FCDBs, both should be subject to the same minimum reporting requirements.
- Today, there is a greater demand for data due to public and scientific awareness.
- Data acquisition is more difficult: more foods, more food products, and more components of interest (lower concentrations, synergism).
- Demand for meta data to establish variance.
- Food supply is constantly changing (fluid).



**This isn't helping your reputation**

# Foods

Foods are anything grown, raised, collected, or manufactured, for human consumption (traditional foods, supplements, herbals (spices), and botanical supplements).

## Food Components

What constitutes components of nutritional interest?

- Proximates
- Essential vitamins, minerals, lipids, amino acids (proven nutrients).
- Secondary metabolites and/or non-nutrient bioactive components (both healthful and harmful), many unproven.



I like you Bob, you're smart, a hard worker and you're full of potassium

# Journal/Database Requirements

Data should be as complete, reproducible, and transparent as possible.

General areas of concern:

- Meta data
- Sampling plan
- Sample pre-processing, storage, and processing
- Analysis
- Data processing
- Supplementary data (i.e., raw supporting data)



# Meta Data: Key to Understanding Variation

## Raw Foods

GxExMxP - genetics, environment, management, and processing

Taxonomy

DNA barcoding/next generation sequencing

Where and when grown, environmental conditions

Farming practices (e.g., conventional vs organic)

Plant part or meat cut

Harvest methods

Post harvest processing (fresh, dried, smoked, etc)

## Processed Foods

Ingredients

Cooking

Container

## Both Groups

Storage

Shipping

Cooking for eating (if necessary)



**As complete  
as possible**

## Sampling Plan

- How, when, where harvested/collected
- Date(s).
- Number of independent samples
- Composites

## Sample Pre-Processing, Storage, and Shipping

- Pre-processing (drying and definition)
- Processing plant location
- Lot number
- Date(s)



# Analysis

## Sample preparation

Number of sub-samples

Lyophilization, grinding, digestion/extraction

Dilution

Date(s) of preparation

## Analysis Method

Specific measurements (no antioxidant or FC)

Validation

Standards

Quality control

Technical repeats

Date(s) of analysis

## Analysis Instrumentation

Chromatography

Detection

All instrumental parameters





# Data Processing

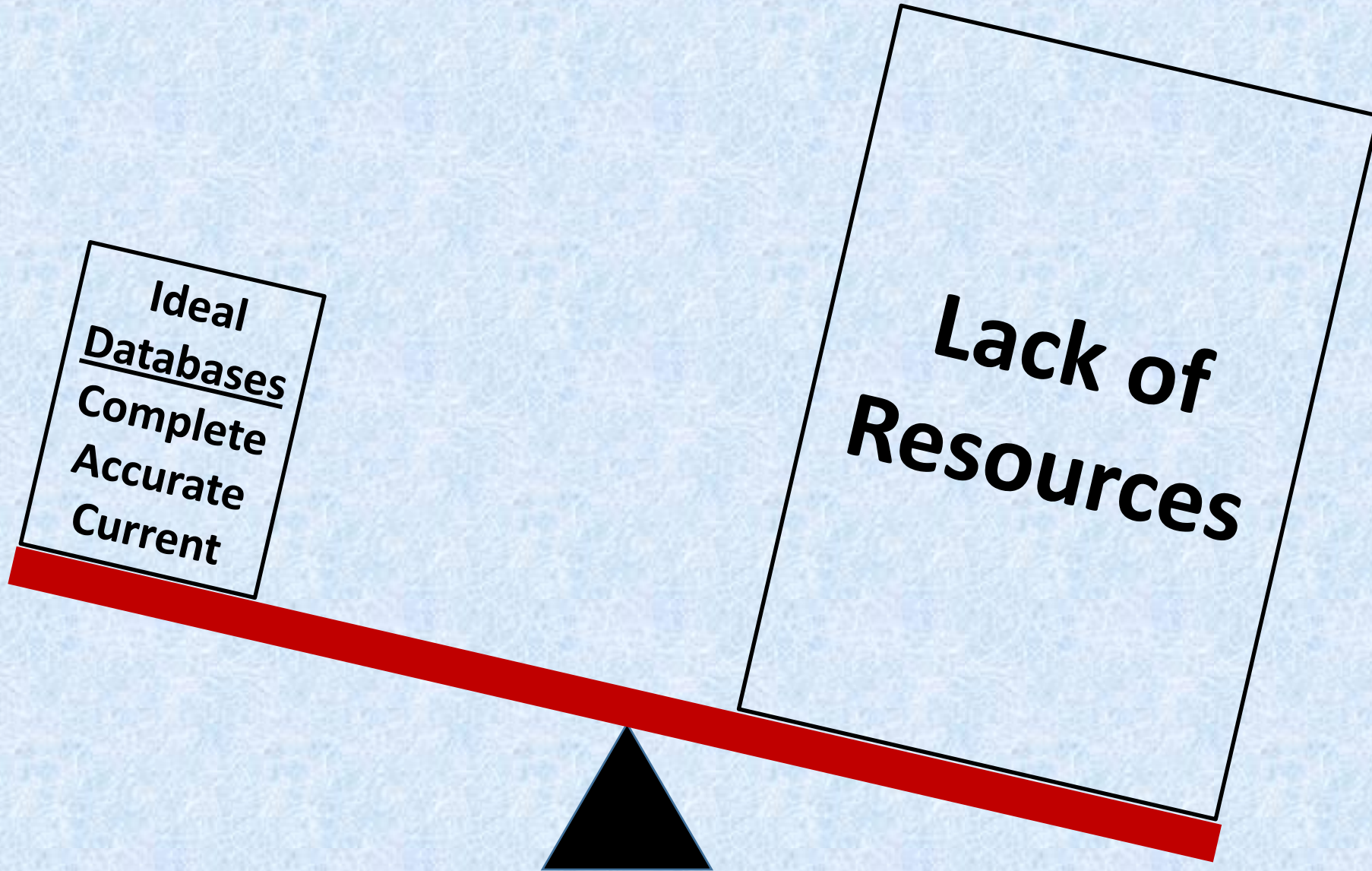
- Calibration
- Formulas for conversion of instrumental data to reported data (e.g., FA vs FAME)
- Denominators: result/(100 g dry or wet or edible or protein or lipid)
- Consistency checks
- Statistics
- Chemometrics
- Sources of variance: intrinsic vs extrinsic i.e., biological vs analytical.

## Supplementary Data

Complete supplementary data (i.e., raw data) allows analysis of variance.



# The Limitations (Reality) of Databases



## **General Problem Areas Observed by FAO**

- **Lack of clear food description**
- **Lack of edible portion description**
- **Proximates outside limits ( $>\pm 5\%$ )**
- **Lack of moisture data**
- **Lack of pre-processing method description (drying, cooking)**
- **Lack of analytical method description**
- **Lack of component description (form of vitamin)**
- **Lack of formulas for computing reported results**
- **Inability to compute analytical results on 100g basis**
- **Definition of dry weight (level of residual moisture)**

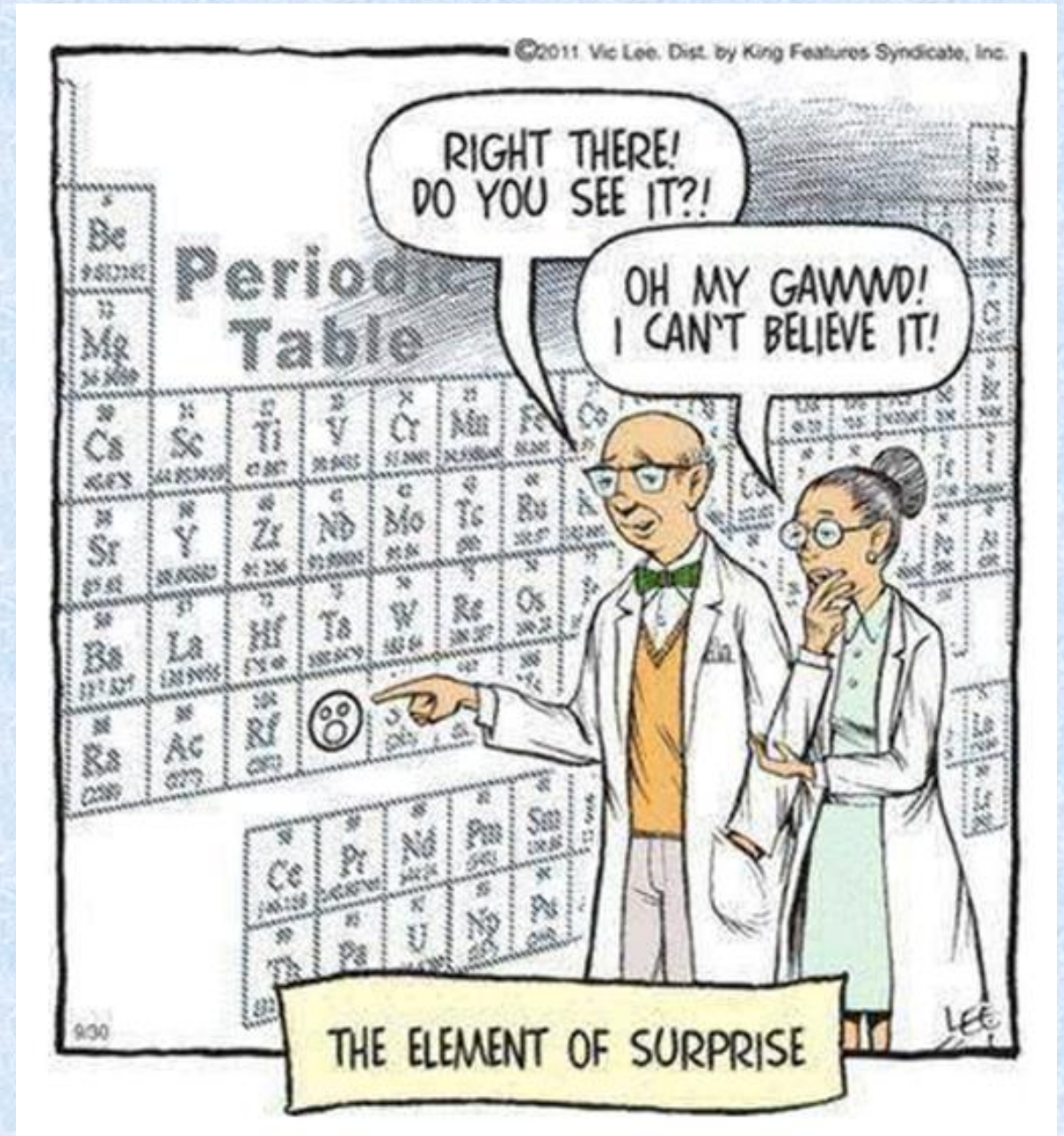
## Specific Results from the FAO Pulse Survey

FAO. 2017. FAO/INFOODS Global Food Composition Database for Pulses Version 1.0 - uPulses 1.0. Rome, FAO. Available at <http://www.fao.org/infoods/infoods/tables-and-databases/faoinfoods-databases/en/>

Papers screened	800	
Papers rejected	576	71%
Most common reasons for rejection:		
No moisture values	236	30%
Missing dry basis or edible portion	196	24%
Data only in graph	35	4%
Can't convert to results per 100g	23	3%
Proximates out of range	17	2%
Others	69	8%

# Summary

- Need transparency, transparency, transparency!!!
- Need complete meta data.
- Need descriptions of all aspects of data collection, processing, preparation, analysis, and computation.
- Future will require interconnection of databases.
- Journals responsibility to ensure that minimum reporting criteria are met.



# Submission of Papers to Journal of Food Composition and Analysis

- JFCA will be publishing papers from the conference
- There are 4 categories:
  - Original research, Short communications, Reports, Comments
- Original research and short communications will be rigorously reviewed through the normal journal process.
- All submissions must be in the journal format.
- Guidelines can be found at Poster #
- Information for submission of papers from 12<sup>th</sup> IFDC 2017 will be available by the end of October 2017 at: <https://www.journals.elsevier.com/journal-of-food-composition-and-analysis>.
- For technical information concerning submission procedures please send your email to [jfca.elsevier@gmail.com](mailto:jfca.elsevier@gmail.com), with the following in the Subject line of the email: SI: IFDC 2017 or speak to myself or Dr. Judith Crews this week.

