Validation of nutrient retention factors by using the EuroFIR recipe calculation method

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Objective

- Standard recipe calculation method was agreed by EuroFIR partners
- Structured, standardised dataset of nutrient retention factors (NRF) has been developed within the EuroFIR project

→ Object of the present work is the validation of this standard set of NRF by using the EuroFIR recipe calculation method and to improve its user-friendliness
Procedure

Analysed values of vitamins and minerals in cooked foods

Calculated values of vitamins and minerals in cooked foods by using the EuroFIR recipe calculation method

Comparison of results

Data collection (1)
Data collection of dishes conducted at the MRI

apple pie  fried trout  fried potatoes

• Sensory testing
• Documentation
• Analysed nutrient content of ingredients AND dishes
Data collection (2)

Data collection from the EuroFIR partners

- Recipes
- Analysed nutrient content of dishes

EuroFIR recipe calculation method (1)

1. Food composition database (FCDB)
2. Weight yield factors
   - Selection of country-specific weight yield factors
   - Recipe level
3. Nutrient retention factors (NRF)
   - Selection from the dataset of NRF (structure based on LanguaL)
   - Ingredient level
EuroFIR recipe calculation method (2)

- Ingredient 1
- Ingredient 2
- Ingredient 3

Weight of cooked composed food

Nutrient content of cooked composed food

YF

NRF ingredient 1
NRF ingredient 2
NRF ingredient 3

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Selection of NRF through combination of LanguaL facets for food group and cooking method (example: apple – baked)

(Vásquez-Caicedo et al. 2008)
Weakness concerning structure of the dataset of NRF

- Correction and simplification of the recommended choice of NRF
  - Herbs and spices
  - Water
  - Cooked potatoes and other cooked products

- Inclusion of some missing foods and food groups
  - Table salt
  - New food group “others”

General comparison of results (1)

- The calculated thiamin content of the fried trout shows no significant differences

- Partly large differences (ascorbic acid of the apple cake)
General comparison of results (2)

- Small percentual deviation (less than 10%) of some riboflavin, iron, magnesium and copper results
- The deviation was independent of the used FCDB

Overestimation of NRF?

- Probably underestimated NRF for pyridoxin and ascorbic acid
- To low chosen NRF of the vitamins thiamin, riboflavin, pyridoxin and ascorbic acid for the apple pie
Effect of the parameter „pressure“ on the NRF

- Retention of the vitamins thiamin, riboflavin and ascorbic acid of the pressure cooked potatoes is higher, retention of pyridoxin is lower than the boiled potatoes
- NRF of the vitamins thiamin, riboflavin and ascorbic acid for „steamed with pressure“ to high, for pyridoxin to low

Conclusions

- Improved and user-friendly structure of the dataset of NRF
- Recommendations for corrections of NRF or new NRF
- Necessity of a larger dataset of NRF for reliable calculations
- Expansion of the dataset of NRF to include all food groups and cooking methods
- Proposal: develop a NRF database and a software to simplify the handling and reduce the error sources
We think, that the dataset of NRF are ready to be used by a broader audience.