

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

8th International Food Data Conference

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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



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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







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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

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Data collection (2)

Data collection from the EuroFIR partners


			
Sarmale	Spezzatino	chickpea soup	rabbit stew

- Recipes
- Analysed nutrient content of dishes



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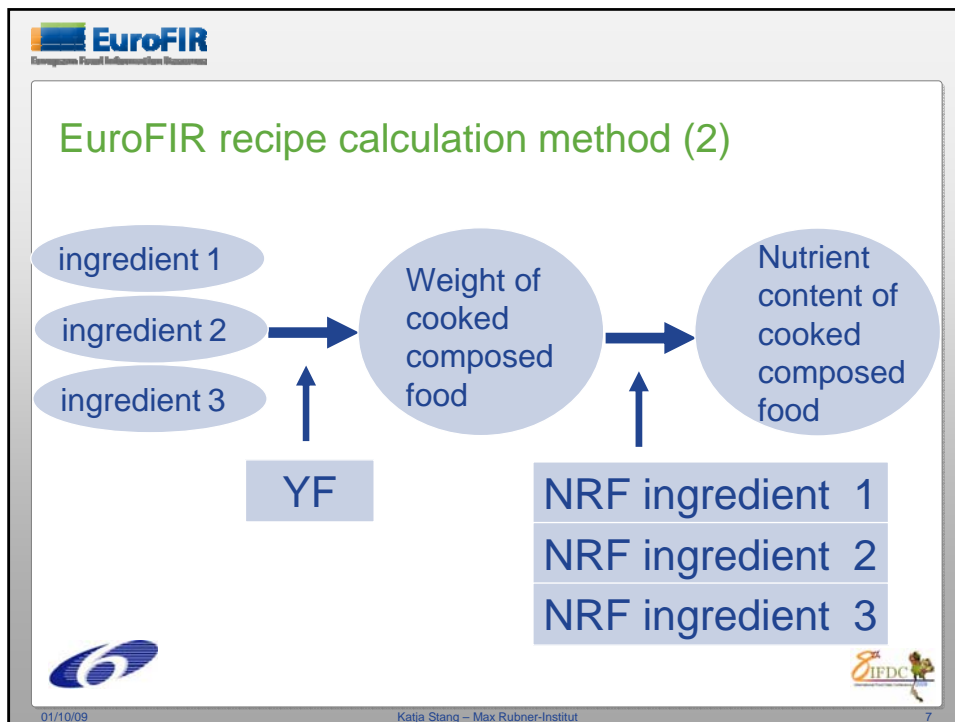
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EuroFIR recipe calculation method (1)

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

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Selection of NRF

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

EuroFIR Food Classification	LanguaL Code	Other relevant facets	Other relevant facets	LanguaL Code	Biotin	Biotin source	Vit C	Vit C source
	Facet A		Cooking method	Facet G				
Egg or egg product	A0790		Cooked by dry heat	G0004	100	2	100	2
			Baked or roasted	G0005	100	2	100	2
Fat or oil	A0805		Cooked by dry heat	G0004	100	2	100	2
			Baked or roasted	G0005	100	2	100	2
Fruit or fruit product	A0833		Cooked by dry heat	G0004	100	7	80	6
			Baked or roasted	G0005	100	1	80	3
			Broiled or grilled	G0006	100	5	80	3

(Vásquez-Caicedo et al. 2008)

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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”



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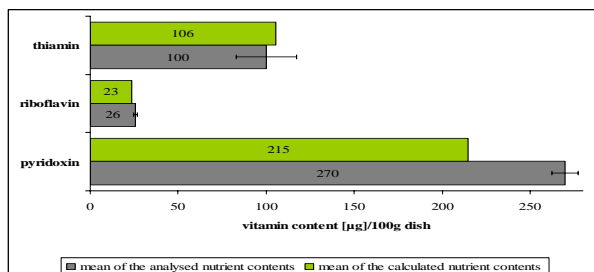
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General comparison of results (1)

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



- Partly large differences (ascorbic acid of the apple cake)



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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



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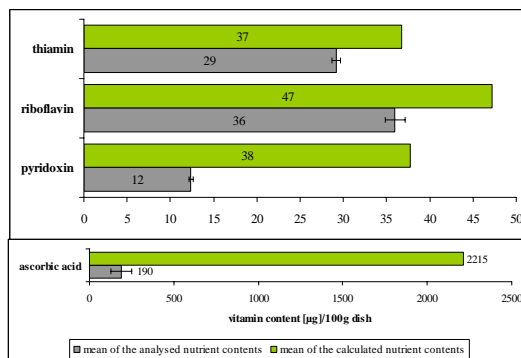
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Overestimation of NRF?

- Probably underestimated NRF for pyridoxin and ascorbic acid
- To low choosen NRF of the vitamins thiamin, riboflavin, pyridoxin and ascorbic acid for the apple pie



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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



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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



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We think, that the dataset of NRF are ready to be used by a broader audience.

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