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## Estimation of Nutrient Values from Label Data in Branded Foods

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### Title

Estimation of Nutrient Values from Label Data in Branded Foods

### Introduction

Labels of commercial food products usually declare a few nutrient values according to national legislation and sometimes contain additional voluntary values. This rather small number of nutrient values limits information for consumers as well as investigations such as evaluations of consumption surveys.

### Objective

The main goal was to develop a tool that helps compilers to estimate missing micronutrient values for branded foods. The tool should take the ingredient list, find appropriate foods in a food composition database (FCDB), estimate ingredient amounts and perform recipe calculation. The outcomes are calculated macro- and micronutrients of the branded food where deviations to macronutrients on the label should be minimised. Important is that weight yield and nutrient retention factors are considered and the tool is user-friendly.

### Methodology

Two promising algorithms, based on goal programming and linear programming, were selected, investigated and improved before they were implemented and compared. Investigations included identification of error sources and how they impact outcomes and improvements included letting

the algorithm select foods in a FCDB and to consider ingredient sublists where an ingredient has its own ingredient list. The final tool was then implemented in FoodCASE and further improved.

## Main findings

The two algorithms delivered similar results while the goal programming approach proofed to be more stable. The investigated issues revealed that both algorithms sometimes tend to change the order of ingredients to find better results. While the implemented improvement to handle ingredient sublists increases accuracy of the outcome, other improvements showed to have less impact. Presenting the outcome in FoodCASE with a spider diagram, in addition to a nutrient table, have been shown to be effective and easy to interpret.

## Conclusion

The implemented tool in FoodCASE proofed to deliver acceptable results and to be user-friendly. The additional investigations and improvements helped to increase accuracy and to gain knowledge about the usage of the algorithm. Nevertheless, nutrient estimation is challenging and more investigations would be helpful to further improve the tool.

## Key words (3-6)

Food composition, food labelling, FoodCASE, branded food, nutrient estimation, recipe calculation