

A Web-application to reformulate recipe through optimization: proof of concept

Romane Poinso^a. Matthieu Maillot^a. Rozenn Gazan^a. Florent Vieux^a

^a MS Nutrition
La solution quantitative Marseille, France

Introduction

Improving the nutritional quality of food products through reformulation is a key approach to improve diet quality and to reduce the prevalence of non-communicable diseases

Objective

Provide a web application able to take into account impact of process when:
-Estimating the nutritional composition of processed foods
-Improving the nutritional content through recipe optimization

Materials and Methods

Description of the Web-app:

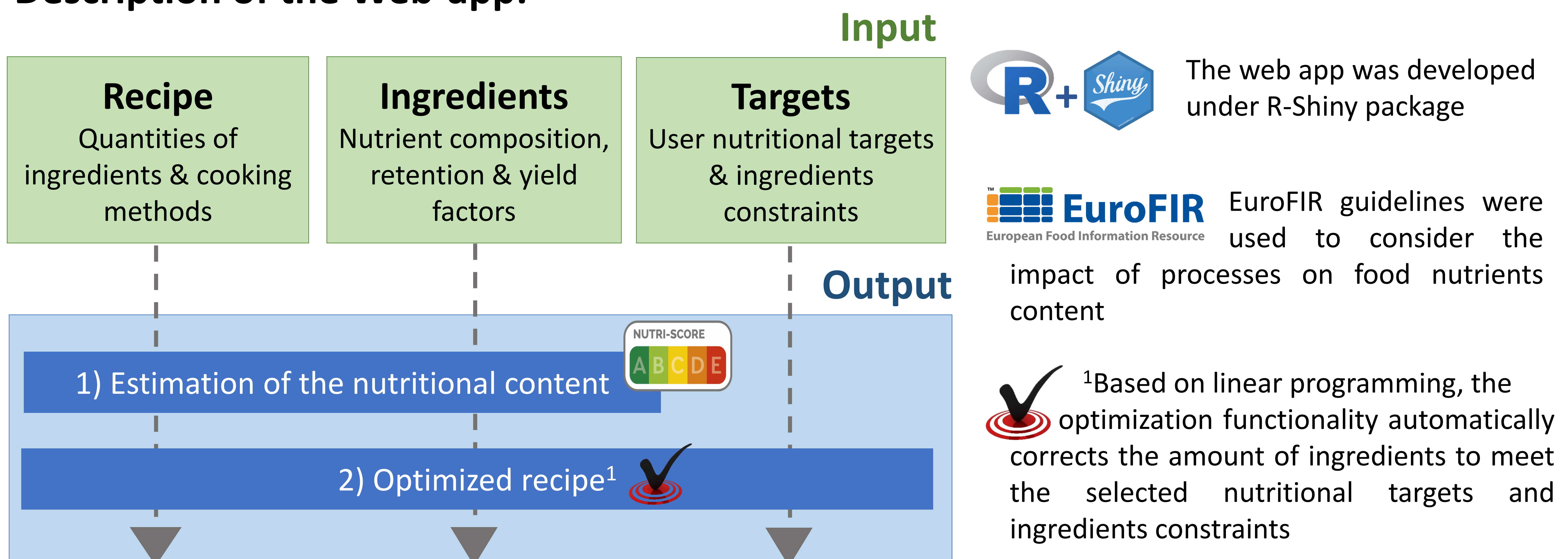


Figure 1. Schematic representation of the web app

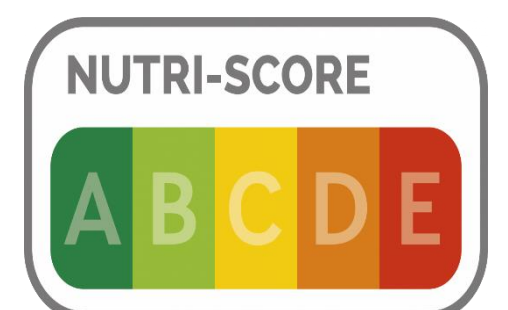
Proof of concept:



Traditional Czech Bramborak dish

Input: Recipe and ingredients information was taken from previous study². **Targets** were set to improve saturated fatty acids (<4g/100g), sodium (<360mg), fiber (>2.1g/100g) and proteins (>12% E) contents simultaneously while keeping acceptable proportions in amounts of milk, flour and eggs (same as in initial recipe)

Output: Nutri-Score was used as nutritional indicator for comparing nutritional quality of the initial and the optimized Bramborak recipes



Results

1) Estimation of the nutritional content:



The initial Bramborak was ranked **C** according to the Nutri-score.

2) Optimized recipe:

The Web app suggests **increasing** amounts of garlic, wheat flour, eggs, and **decreasing** amounts of potatoes, lard and salt (Table 1).

The optimized Bramborak reaching nutritional targets was ranked **B**.



	Initial (g)	Optimized (g)
Garlic	0.8	1.3
Wheat flour	18.0	29.5
Eggs	3.6	5.9
Potatoes	68.6	58.0
Lard	8.1	4.4
Salt	0.9	0.7

Table 1. Initial and optimized quantities of raw Bramborak ingredients, for 100g

Conclusion

Organoleptic qualities of the optimized recipe were not taken into account but adding more constraints on the amount of ingredients could help to design a more acceptable recipe. This web-application needs to be expanded with additional nutrient compositions of ingredients and fine-tuned according to food industry needs.

²Machackova, Giertlova, Porubská, Roe, Ramos, Finglas. EuroFIR Guideline on calculation of nutrient content of foods for food business operators. Food chemistry. 2018