

Dietary assessment with the online platform MyFitnessPal: a reliable method?

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INTRODUCTION

Standard dietary analysis

= with a food composition data table



Solution?

Digital platform with an online food database



Advantage : Faster and easier

Nutrient values yet displayed

Disadvantage : Reliable?

Partially user-based

AIM

Examine **accuracy of nutrient analysis** with MyFitnessPal, by comparing with the standard method

Disadvantage : (time)-expensive

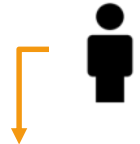
Translation food item to nutrient values

MATERIAL AND METHODS

Study sample

Hundred digital 4d-diaries registered with MyFitnessPal (MFP)

N=50



Participants of a 30d-trial on the impact of wheat bran on human health

All participants received a clear manual with instructions on the usage of MFP :

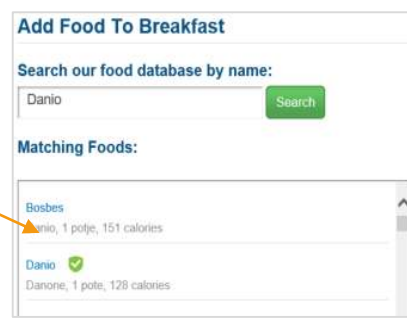
- Step by step guidance with illustrations
- Guidance on food item selection to upturn accuracy of nutrient values

a) Pre-registered Targid-tagged items

- mainly generic food items, Eg. *Targid banana*

b) Green checkmarked items

- checked for accuracy by MFP administrators



Data analysis

One registration method, two food databases for nutrient analysis

(Analysis included : Energy intake, macronutrients, sugar, fibre, cholesterol and sodium)

1) MFP and 2) Nubel, the Belgian food composition data table⁽¹⁾

a) Data clean-up

T1 dataset : Used for development of an objective MFP data clean-up method.

Optimization simulation study to define upper limits at food item level.

↳ This clean-up method was applied to the T2 dataset

b) Correlation analysis and Bland-Altman plots

All analyses were performed using the cleaned and uncleaned T2 dataset.

c) Power simulation analysis : power loss if MFP for nutrient analysis

- Per nutrient, simulation of a correlation range ($r=0-0.5$), Nubel vs. random variable H. Next, correlations between MFP (known) and H (calculated) was retrieved. Also, the associated powers were calculated
- Powers of Nubel and MFP correlated
- Given 80% power and $N(\text{Nubel})=500$, required $N(\text{MFP})$ was calculated

RESULTS AND DISCUSSION

Demographics



- Of the 50 participants, **78%** was female
- 36 normal weight (BMI : $22 \pm 1 \text{ kg/m}^2$) and 14 obese (BMI : $33 \pm 2 \text{ kg/m}^2$)

Data clean-up

- **2.8%** of the nutrient values removed, mostly carbohydrates

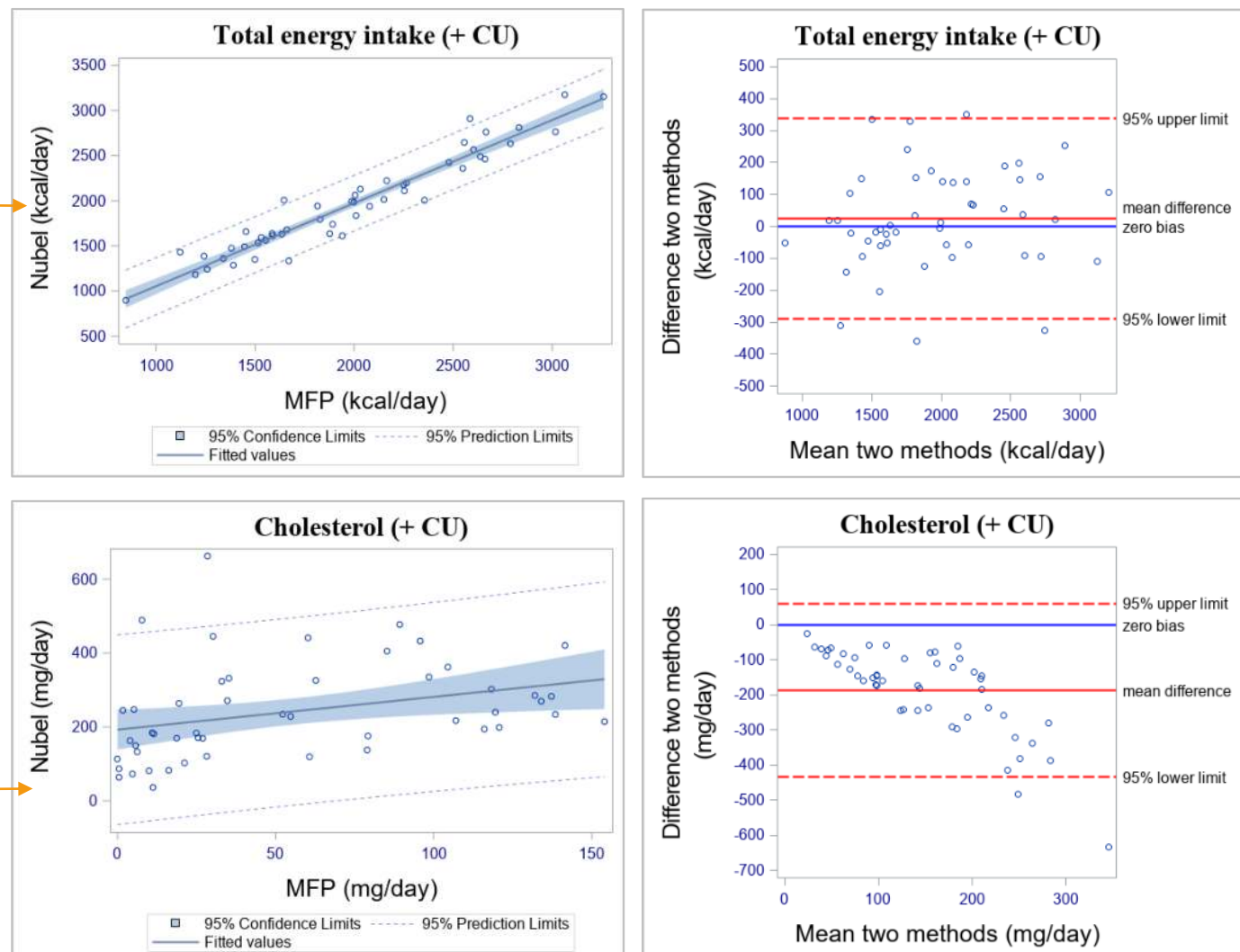
Correlation analysis and Bland-Altman plots

- **Correlations** between MFP and Nubel **further strengthened** after clean-up, for most nutrients
- Bland-Altman plots did **not reveal proportional, nor fixed bias**, with exception of cholesterol and fibre

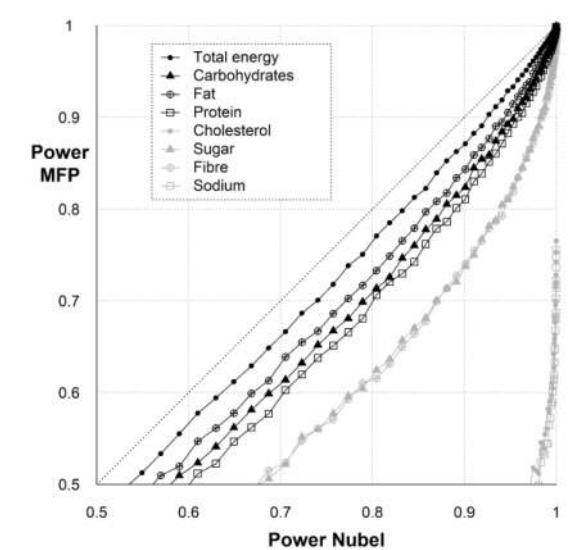
Correlations between MFP and Nubel, with and without data clean-up

Nutrient	No CU	With CU*
Energy intake (kcal/day)	0.96	0.96
Carbohydrate (g/day)	0.70	0.90
Fat (g/day)	0.75	0.90
Protein (g/day)	0.94	0.90
Sugar (g/day)	0.70	0.79
Fibre (g/day)	0.80	0.80
Sodium (mg/day)	0.45	0.53
Cholesterol (mg/day)	0.67	0.51

*CU = clean-up. All analyses were significant ($p \leq 0.001$)



Power simulation analysis



Increase in sample size of MFP required to restore the 80% power of Nubel, with $N=500$

Nutrient	% increase in N_{MFP}
Energy intake	10%
Carbohydrate	25%
Fat	19%
Protein	28%
Sugar	40%
Fibre	36%
Cholesterol	68%
Sodium	72%

- MFP **slightly overestimated energy intake (+1.3%)** and **little underestimated all nutrients**. For macronutrients, this range was **1.7-7.8% underestimation**. Studies comparing MFP with the Brazilian food database⁽²⁾ and with the Nutrition Data System for Research⁽³⁾ observed as well this latter trend.
- The use of a clear manual can partly explain the strong correlations obtained. **Single data extraction with MFP** facilitates greatly the nutrient analysis.

CONCLUSION

To facilitate and speed-up nutrient analysis, MFP is a reliable method for energy intake, macronutrients, fibre and sugar but not for cholesterol and sodium analysis. Data cleaning seem to further improve nutrient assessment.