

Introduction & Gaps

- The use of applications to track daily nutrition has gained popularity in recent years.
- Research findings regarding the reliability and validity of these applications have been inconsistent.
- Research in a Canadian context is lacking.

Objectives

1. To evaluate the inter-rater reliability of Cronometer (CRO) and MyFitnessPal (MFP);
2. To evaluate the validity of CRO and MFP against the 2015 Canadian Nutrient File (CNF), which is regarded as the Canadian 'gold standard'.

Methods

- Three-day food records were obtained from Canadian athletes on two non-consecutive weekdays and one weekend day.
- Food records were entered into CRO and MFP by two independent raters for inter-rater reliability.
- One rater entered each record into ESHA food processor using the CNF for validity.
- Average Calories (kcal), carbohydrates (g), fat (g), protein (g), cholesterol (g), sodium (mg), sugars (g), and fiber (g) were computed by each software (**NOTE:** CRO and CNF each computed additional nutrients).

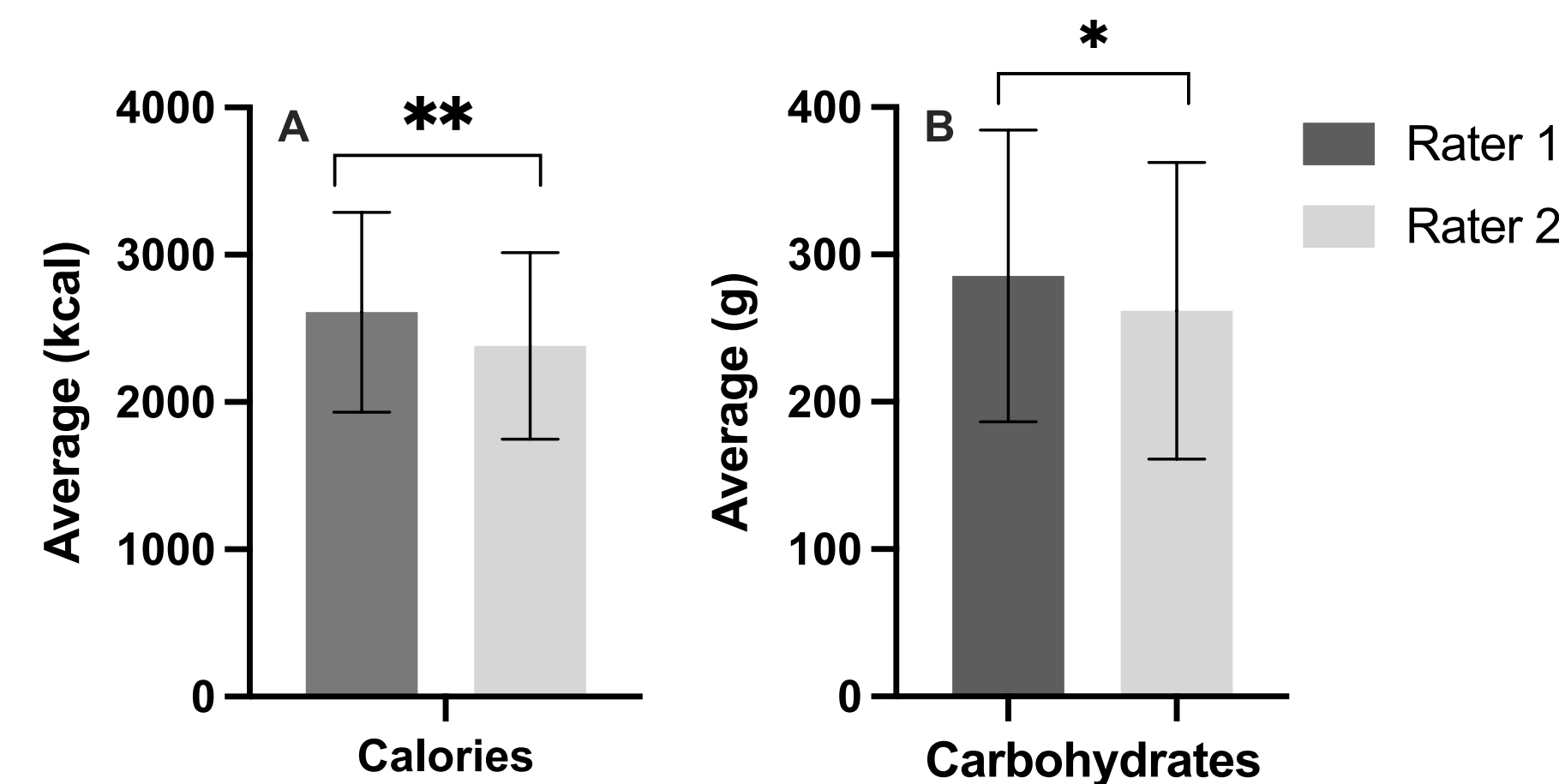
Results

- Forty-three (27M/16F) athletes participated: age: 51.2±6.8 y; height: 1.7±0.1 m; body mass: 72.7±13.9 kg; BMI: 23.8±2.4 kg/m²; exercise: 11.2±3.6 hours/week.

Reliability

- CRO showed good to excellent relative reliability (ICC_{2,1}=0.779-0.998) and good absolute reliability for all nutrients, except iron (Δ[95% CI]=-0.7mg[-1.3 to -0.1], SEM=0.3; p=0.018)
- MFP showed moderate to excellent relative reliability (ICC_{2,1}=0.512-0.952) and poor absolute reliability for total kcal (Δ[95% CI]=225.5[138.9-312.0], SEM=42.9; p<0.001) and carbohydrates (Δ[95% CI]=23.7g[9.5-37.9], SEM=7.0; p<0.002) (**Figure 1**).

Figure 1: MyFitnessPal (MFP) inter-rater reliability for (A) Calories (kcal); and (B) carbohydrates (g). Error bars represent SD. * represents paired t-test p<0.01 ** represents paired t-test p<0.001



Validity

- A one-way ANOVA revealed no differences between CRO, MFP, and the CNF for total kcal, macronutrients, cholesterol, sodium, sugars, and fiber (p>0.05) (**Figure 2**).

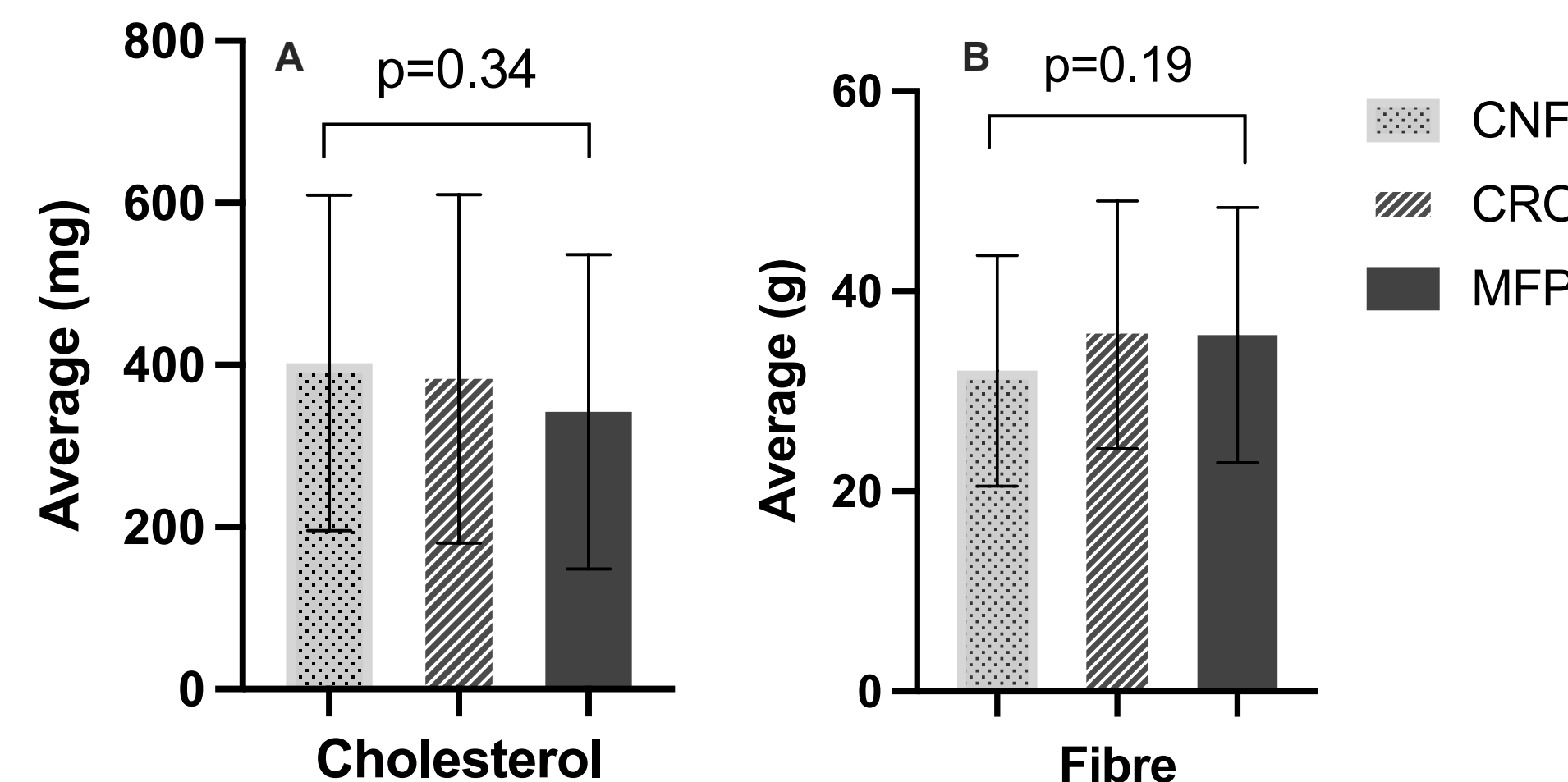


Figure 2: Validity of MyFitnessPal (MFP) and Cronometer (CRO) compared to the reference, Canadian Nutrient File (CNF) for (A) cholesterol (mg); and (B) fibre (g). Error bars represent SD. P values represent one-way ANOVA interaction.

- Bland-Altman plots revealed MFP to be less valid than CRO for measures of kcal and carbohydrates, as evidenced by greater Limits of Agreements (LOA) when compared to the CNF (**Figure 3**).

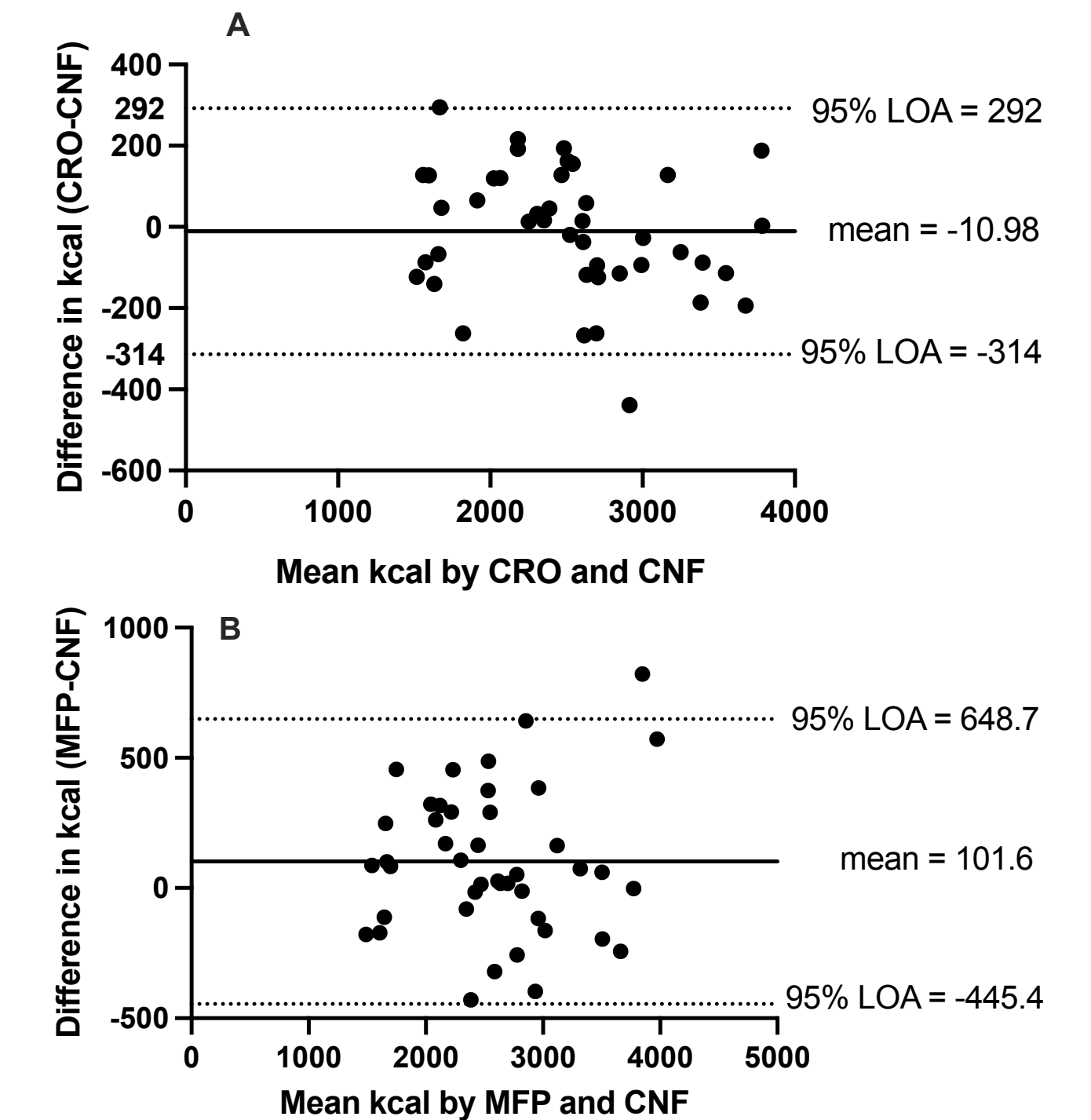


Figure 3: Bland-Altman plots of the two nutrient applications compared to the Canadian Nutrient File (CNF). Mean values of kcal with 95% limits of agreements (LOA; dashed line) are presented between: (A) Cronometer (CRO) and (B) MyFitnessPal (MFP) plotted against the differences for each participant (n=43).

Conclusions

- CRO exhibited greater reliability and validity compared to MFP, and is a suitable alternative to the CNF for tracking nutrients.
- Canadian athletes who use nutrition applications to track their diet should be aware of potential inaccuracies in reports of Calories and carbohydrates from MFP; this may negatively impact achievement of athletic goals.

Acknowledgements