

EVALUATING DIFFERENCES IN MEASURED VERSUS CALCULATED RESTING ENERGY EXPENDITURE IN PERIMENOPAUSAL WOMEN

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INTRODUCTION

Perimenopause is characterized by fluctuations in female-sex hormones and often accompanied by changes in metabolism and body composition, including loss of lean soft tissue (LST)¹. Resting energy expenditure (EE) makes up ~75% of total daily EE and plays a crucial role in weight maintenance², which may impact caloric goals and body composition changes seen in this population.

PARTICIPANTS

AGE (YRS)	HEIGHT (CM)	WEIGHT (KG)	BMI (kg/m ²)
49.4 ± 3.9	163.4 ± 6.1	77.1 ± 15.7	28.2 ± 5.3

Table 1 | Table of participant demographics; expressed in mean ± standard deviation; n = 45; participants were considered perimenopausal if they had decreased menstrual cycle regularity within the last year, but still experienced bleeding.

PURPOSES

- The primary purpose of this study was to compare measured resting energy expenditure (REE) via indirect calorimetry (IC) to predicted REE from common equations in perimenopausal women.
- The secondary purpose was to determine the effect of LST on the differences between measured and estimated REE.

METHODS

Cunningham: $500 + (22 * LST(kg))$

De-Lorenzo: $-857 + (9.0 * Wt(kg)) + (11.7 * Ht(cm))$

Harris-Benedict: $655.96 + (1.850 * Ht(cm)) + (9.563 * Wt(kg)) - (4.676 * Age)$

Molnar: $(12.16 * Wt(kg)) + (6.04 * Ht(cm)) - (12.02 * Age) + 6.43$

Mifflin-St. Jeor: $(10 * Wt(kg)) + (6.25 * Ht(cm)) - (5 * Age) - 161$

Indirect Calorimetry: 25 minutes using ParvoMedics Metabolic Cart and Ventilated Canopy (kcal/day)



Body Composition: Horizon-W; Hologic, APEX Software Version 5.6 was used to determine LST (kg).

STATISTICAL ANALYSES

Measured REE vs estimated were compared using a mixed-model ANOVA. A linear regression was used to examine the effect of LST on predictive equations and RMR.

RESULTS

Mean difference (Measured - Estimated) =

-23.6 ± 58.6	26.1 ± 18.8	-104 ± 79.4*	-162.5 ± 167.9*	-389.8 ± 55.5*
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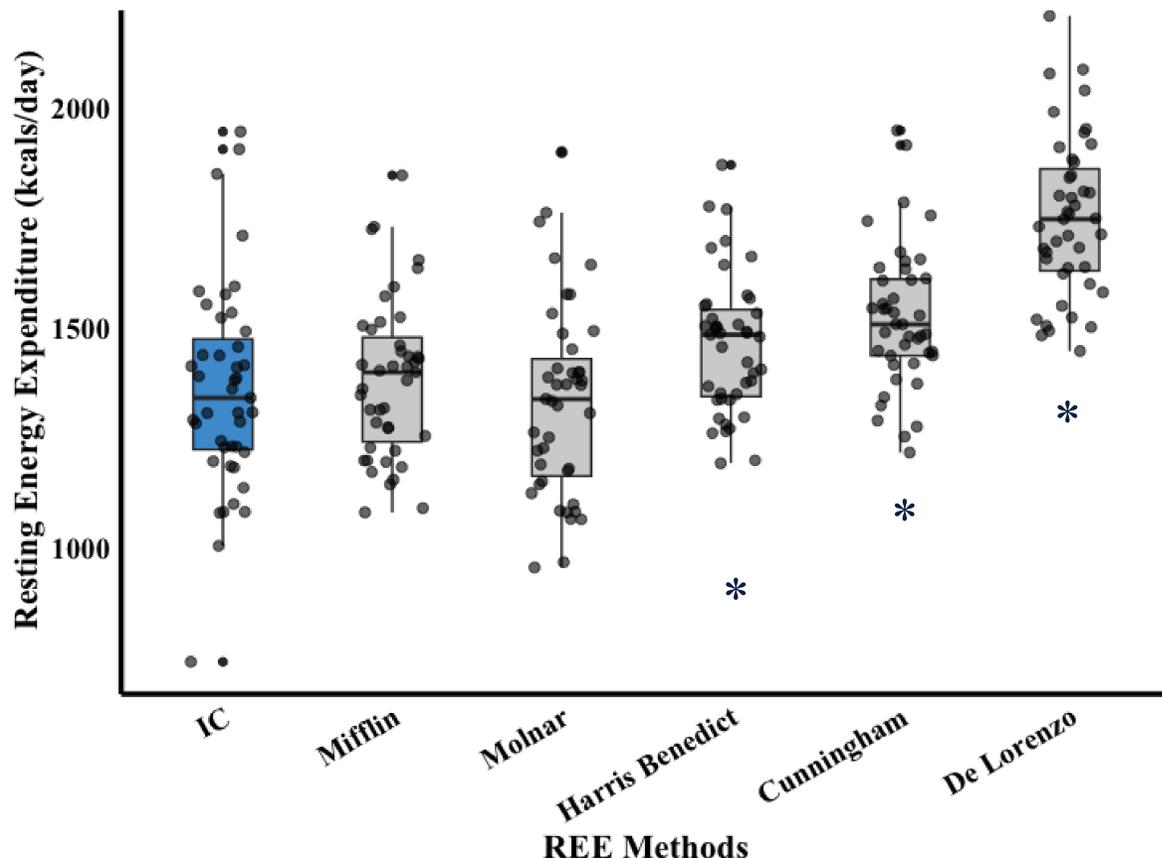


Figure 1 | Box and whiskers plots for measured resting energy expenditure (REE) and predictive metabolic equations (Molnar, Mifflin, Harris Benedict, Cunningham, and De Lorenzo). Lines represent mean values; circles represent individual data points.

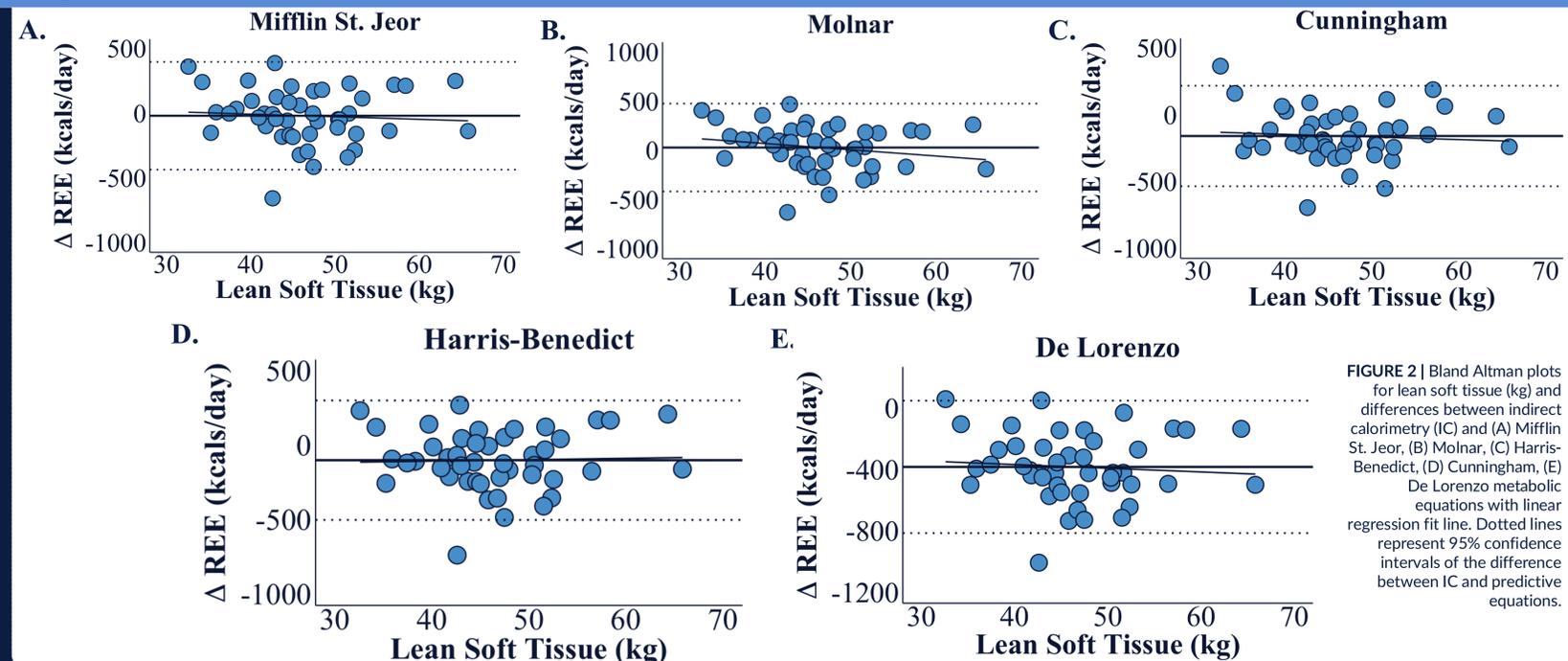


FIGURE 2 | Bland Altman plots for lean soft tissue (kg) and differences between indirect calorimetry (IC) and (A) Mifflin St. Jeor, (B) Molnar, (C) Harris-Benedict, (D) Cunningham, (E) De Lorenzo metabolic equations with linear regression fit line. Dotted lines represent 95% confidence intervals of the difference between IC and predictive equations.

CONCLUSION

Caloric intake is a key foundation for body composition goals. Estimating REE is the most feasible starting point for most women; ensuring the most accurate REE is crucial for supporting nutrition and training. The Mifflin St. Jeor equation may be most beneficial for REE estimates in midlife women.

PRACTICAL APPLICATION

Estimated REE significantly overestimated caloric expenditure, compared to IC by an average of ~215 kcal/day, with some equations (MS, M) more accurately estimating REE in perimenopausal women.

REFERENCES

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