

Intra-Day Variation in Lean Body Mass and Skeletal Muscle Mass Measures: A Pilot Study

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ABSTRACT

Lean body mass (LBM) and its estimated measure of skeletal muscle mass (SKMM) is ~30 to ~40 % of total body weight. Measuring SKMM is an important assessment for both exercise and nutritional research. There is biological variation in dual X-ray absorptiometry (DXA) estimates related to subject presentation, changes in tissue hydration, as well as GI tract contents. **PURPOSE:** The purpose of this study is to examine how normal activities (e.g. eating, sleeping, exercise) influence LBM and SKMM measures using DXA in college students. **METHODS:** (Mean \pm SEM; n = 42; Age: 26.9 ± 0.4 y; ht: 169.2 ± 1.3 cm; wt: 73.0 ± 2.5 kg; body fat 27.0 ± 1.5 %; LBM: 51.3 ± 1.7 kg; appendicular lean soft tissue (ALST): 23.9 ± 0.9 kg). Each participant underwent an AM (0600-0800 h) and PM (1800-2000 h) DXA (Lunar Prodigy; GE Healthcare, Madison, WI), BIA (720; InBody, Cerritos, CA) scan, Ultrasonography (LOGIQ e, GE Healthcare, Wauwatosa, WI) of the right vastus lateralis (VL), and completed a 3-day dietary recall using Myfitnesspal. **RESULTS:** Differences were found between AM and PM in LBM ($+275.2 \pm 89.6$ g; p = .003), ASLT ($+226.1 \pm 65.7$ g; p = .001), SKMM ($+274.8 \pm 78.9$ g). No difference was found in muscle thickness measures (MT). There was an increase found in extracellular body water ($+176 \pm 86.2$ g; p = .04) Daily carbohydrate (CHO) intake (-47.5 ± 13.5 g; p = .001), fat (FAT) intake (-15.23 ± 3.8 g; p = .0004), protein (PRO) intake (-22.2 ± 5.3 g; p = .0002), and Kcal intake (-413.3 ± 85.5 g; p = <.00001) were found less on assessment day. **CONCLUSION:** Currently, our results suggest that there may be minimal increases in SKMM and LBM indices during intra-day composition assessments, which can not be explained by Kcalorie intake.