

## Supplemental Material 3

**Equations for calculating daily calorie needs for energy balanced controlled feeding used in the ROME study (R01CA235598)****Step 1: Calculate a base equation (used for all participants with Step 2 adjusting it for participants randomized to the aerobic exercise condition)**

To calculate total energy expenditure (TEE), insert resting energy expenditure (REE) measured by indirect calorimeter from the most recent study assessment into the following equations developed per race based on prior datasets generated in the laboratory of Dr. Gary Hunter.<sup>105,106</sup>

European Americans:  $TEE = 1124 + (.725 * REE)$

African Americans:  $TEE = 1074 + (.725 * REE)$

Note: The ROME study uses the European American equation for individuals of Asian descent.

**Step 2: Refine base equation for participants randomized to the aerobic exercise condition**

Exercise energy expenditure for each workout based on the a priori exercise progression protocol ( $\dot{V}O_{2peak}$  in ml/kg/min and BDW [body weight] in kg) are entered into the equation with the weekly total averaged over 7 days (to get a daily average needed for the daily controlled feeding menu). This daily average is added to the base equation calculated under Step 1 to determine the daily calorie needs for participants randomized to the aerobic exercise condition.

## Continuous training

WK1:  $3 * 0.05 * \dot{V}O_{2peak} * BDW/7$

WK2:  $3 * 0.0597 * \dot{V}O_{2peak} * BDW/7$

WK3:  $3 * 0.08 * \dot{V}O_{2peak} * BDW/7$

WK4:  $3 * 0.103 * \dot{V}O_{2peak} * BDW/7$

WK5:  $2 * 0.13 * \dot{V}O_{2peak} * BDW/7$

WK6:  $2 * 0.13 * \dot{V}O_{2peak} * BDW/7$

WK7:  $2 * 0.13 * \dot{V}O_{2peak} * BDW/7$

WK8:  $1 * 0.13 * \dot{V}O_{2peak} * BDW/7$

WK9:  $1 * 0.13 * \dot{V}O_{2peak} * BDW/7$

WK10:  $1 * 0.13 * \dot{V}O_{2peak} * BDW/7$

## Interval training (added in later weeks per protocol)

+  $1 * 0.0675 * \dot{V}O_{2peak} * BDW/7$

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+  $1 * 0.0743 * \dot{V}O_{2peak} * BDW/7$

+  $2 * 0.078 * \dot{V}O_{2peak} * BDW/7$

+  $2 * 0.0844 * \dot{V}O_{2peak} * BDW/7$

+  $2 * 0.0911 * \dot{V}O_{2peak} * BDW/7$

Note: Exercise-related energy expenditure is greater during first 4 weeks (vs. later weeks) because interval training decreases volume and thus, decreases energy expenditure required.

Note: Rationale for coefficients used to estimate energy expenditure during exercise as follows:

- The week 1 coefficient of 0.05 is based on:
  - Subjects train at 50%  $\dot{V}O_{2peak}$  (60% max heart rate is about 50%  $\dot{V}O_{2peak}$ ) or the proportion 0.5.
  - The  $\dot{V}O_{2peak}$  is in ml/kg/min and must be converted to l/kg/min, therefore we must divide by 1000.

- There are 5 kcal burned for each liter of oxygen used and the subjects train for 20 minutes during the first week.

Therefore, the equation is  $0.5 * 5 * 20/1000 = 0.05$  for week 1. The same methods are used for subsequent weeks as the intensity (proportion  $\dot{V}O_{2peak}$ ) and duration increase.