

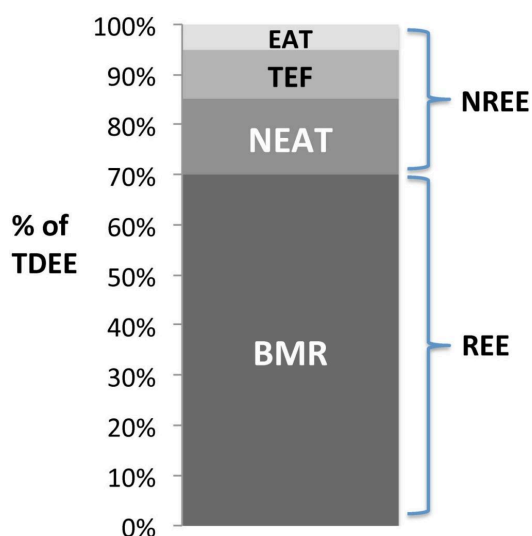
NEAT (Non-Exercise Activity Thermogenesis)

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NEAT

NEAT is the daily energy expenditure that is additional to the better known: Basal Metabolic Rate (BMR), Exercise Activity Thermogenesis (EAT) and the Thermic Effect of Food (TEF) (of which all 4 make up our total daily energy expenditure (TDEE)).

Non-exercise activity thermogenesis (NEAT) is the energy expended for everything we do that is not sleeping, eating or sports-like exercise. It ranges from the energy expended walking to work, typing, performing yard work, undertaking gardening tasks and fidgeting. Even trivial physical activities increase metabolic rate substantially and it is the cumulative impact of a multitude of exothermic actions that culminate in an individual's daily NEAT. It is, therefore, not surprising that NEAT explains a vast majority of an individual's non-resting energy needs.



As can be seen from the diagram on the right, NEAT is the largest controllable factor (BMR isn't really controllable, it is affected by what we do and what we eat but there is a base BMR that our body controls to ensure that all systems function appropriately – We have no control over this).

The importance of NEAT becomes apparent when considering the following: the variability in BMR between individuals of similar age, BMI and of equal gender ranges around 7-9%, while the contribution of TEF is maximally 15%. Thus, BMR and TEF are relatively fixed in amount and account for approximately three quarters of daily TDEE variance. As EAT is believed to be negligible on a population level, NEAT consequently represents the most variable component of TDEE within and across subjects. It is responsible for 6-10% of TDEE in individuals with a mainly sedentary lifestyle and for 50% or more in highly active subjects.

NEAT varies widely in a population and by up to 2000 kilocalories/day between two individuals of similar size. These differences are related to complex interactions of environmental and biological factors, influenced by people's different occupations and leisure-time activities, as well as molecular and individual genetic factors. Recent evidence links NEAT with the incidence of obesity-related chronic diseases, such as diabetes.

Physiological studies demonstrate, intriguingly, that NEAT is modulated with changes in energy balance; NEAT increases with overfeeding and decreases with underfeeding.

NEAT could be a critical component in how we maintain our body weight and/or develop obesity or lose weight.

When an individual calorie restricts to lose weight, BMR is typically reduced. Any potential negative effects of fasting/dieting can be largely negated by increasing physical activity. This can be in the form of concentrated training sessions (gym, aerobic, etc) or a conscious effort to increase NEAT each day.

There is evidence to suggest that spontaneous physical activity, a component of NEAT, is decreased in energy restricted subjects, and may remain suppressed for some time after subjects return to *regular* feeding. Persistent suppression of NEAT may contribute to weight regain in the post-diet period. This highlights that conscious effort required to undertake regular physical activity when a client aims to lose fat mass through any calorie restriction regime.

Lean Body Mass (LBM) is directly correlated to BMR – so under most circumstances, when aiming to lose weight through a hypocaloric diet, it would be wise to follow these key recommendations:

- 1. Hypocaloric diets induce a number of adaptations that serve to prevent further weight loss and conserve energy. It is likely that the magnitude of these adaptations are proportional to the size of the energy deficit, so it is recommended to utilize the smallest possible deficit that yields appreciable weight loss.*
- 2. Weight reduction should be viewed as a stepwise process in this context; as weight loss begins to plateau, energy intake or expenditure should be adjusted to "re-open" the energy deficit.*
- 3. Large caloric deficits are also likely to induce greater losses of LBM and compromise exercise performance and recovery, which are of particularly important to the athlete population.*
- 4. Participation in a structured resistance training program and sufficient protein intake are also likely to attenuate losses in LBM. Additionally, high protein diets ($\geq 25\%$ PRO) are associated with increased satiety and thermogenesis, making them a better option for the calorie-restricted client.*
- 5. As a significant component of TDEE, a focus on NEAT activities during any phase of calorie restriction will minimise the drop in thermogenesis and limit weight loss plateaus.*

SUMMARY:

NEAT is an often forgotten key variable in our daily challenge of maintenance of our body weight (or weight loss!). This challenge is often exacerbated during winter (double whammy of colder weather (less outdoor activity) and higher density foods). NEAT offers a potential combatant to weight gain in the winter or stagnation of weight loss at any other time.

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