

Metabolism – A Current Review

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Basal Metabolic Rate

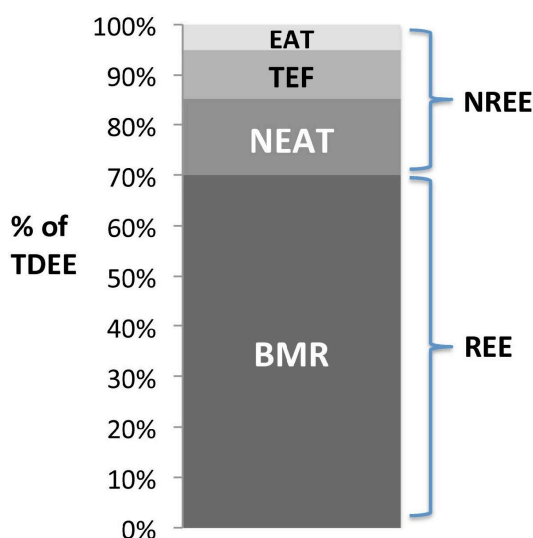
The goal of this article is to try to shed some light on the immense amount of data (and often conflicting views) that is currently available on the topic of Basal Metabolic Rate (BMR), exercise & dieting/fasting.

This is not a comprehensive review by any means – but based on current scientific literature and experts in the field – this introduction to Metabolism/weight loss will hopefully stimulate discussion when planning exercise and nutritional programs.

Before beginning, I wanted to share a general overview of what makes up our Total Daily Energy Expenditure (TDEE).

Total Daily Energy Expenditure(1)

EAT = Exercise Activity Thermogenesis*



TEF = Thermic Effect of Food[#]

NEAT = Non Exercise Activity Thermogenesis

BMR = Basal Metabolic Rate

NREE = Non Resting Energy Expenditure

REE = Resting Energy Expenditure

* Thermogenesis literally means the production of heat (the amount of energy produced).

[#] The energy required to burn the food that you eat.

One of the challenges with the amount of unscientific information available on the internet these days is filtering out the true/correct information.

For example, there is a huge amount of discussion around BMR and how we should target this factor in weight loss – but if you look at a person's Total Daily Energy Expenditure (TDEE), you will see that there are several components to your TDEE and that we have full control over three of the 4 components.

Those being:

1. The amount of food we eat. (TEF)
2. The amount of exercise we do. (EAT)
3. How active we are during each day. (NEAT)

The following section are comments on some typical views on BMR that are currently in the media:

Eating 5-7 meals/day increases your BMR and helps you lose weight.

This is just untrue – Dr Jason Fung (<https://www.dietdoctor.com/authors/dr-jason-fung-m-d>) a world expert in weight loss has for many years been against the multiple small meals per day “weight loss” plan that has been promoted globally.

A recent article (2) from the USA where over 50,000 adults were tracked over several years has highlighted that this type of eating plan increases Body Mass Index (BMI), not decreases it!!!

Abstract:

‘Subjects who ate 1 or 2 meals/day had a reduction in BMI per year compared with those who ate 3 meals/day. On the other hand, eating >3 meals/d (snacking) was associated with a relative increase in BMI’.

In an ideal environment where you were able to 100% control the food intake and energy expenditure of your clients, maybe this type of plan would work; but we are not in the ideal world, we are in a world where lack of activity and easy access to fast food is all too common.

On a personal note, for >30 years now I have witnessed gym clients who start taking protein powders multiple times per day, eat dozens of eggs and become serious carnivores all with the goal of putting on mass only to find that 50% or more of their mass gains is adipose tissue. They then enter a cutting phase (often leading up to Summer) only to lose as much muscle as fat and often end up where they started 6-months earlier.

Eating first thing in the morning (Breakfast) is important to stimulate your BMR as it reduces over night.

I am not against eating breakfast, but it is not for the typical reasons given (such as giving your BMR a kick in the morning due to it being sluggish whilst sleeping over night).

It is true that your BMR can reduce as much as 15% overnight (due to your lack of activity when asleep) – but if you stick to a 3-meal per day plan (breakfast, lunch, Dinner) or as has been suggested, two main meals (breakfast, lunch) and then only a light snack for dinner – there is an

increase in metabolism that takes place after ~12-hours of fasting – which negates any drop in BMR due to the long period of inactivity whilst asleep.

Abstract(3):

Resting metabolic rate (kJ/min) was increased after 12h of fasting.

There has been false information disseminated that your energy levels will be low during the day if you don't start off with a good breakfast. Again this view was debunked years ago.

'Resting energy expenditure in short-term fasting is increased as a result of an increase in serum norepinephrine' (4).

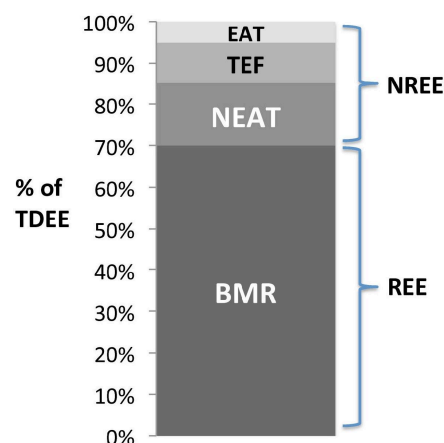
Also, during your sleep cycle, this is where the body has the best opportunity to repair itself from the demands of the day just passed. The body requires energy to undertake these repairs, so if you have a stomach full of food just prior to going to sleep, then your body has all the energy components required to undertake this repair process and will in most likelihood have no need to access your fat stores for energy.

BUT, if you go to bed with a lack of food in your digestive system, the repair process must go on and therefore the body will then start to access fat stores to complete this repair work resulting in an increased burning of fat whilst you sleep.

I have had a lot of success with clients whom the only nutritional change we made to their day was to reduce the amount of food they ate at dinner time. If possible go to bed hungry (the good news is that you don't feel hungry when you are asleep!!).

Exercise is an important component of maintaining BMR and any associated weight loss.

This is unfortunately another fallacy that demotivates new clients when engaging in a new exercise routine. Every day we have aspiring clients whom join our gym with the goal of changing their body shape for the better.



As you can see by this image to the right:

Within the general population, EAT (Exercise Activity Thermogenesis - calories burnt whilst exercising) only makes up 5% of the TDEE (Total Daily Energy Expenditure).

Those who take their exercise more seriously will have a higher EAT but rarely does it make up more than ~15% of TDEE.

So to lose any significant weight (particularly if you don't modify your eating behaviour) whilst exercising is a very large task.

What I tell my clients is that exercise isn't for weight loss (this is largely achieved from better nutritional management), but exercise is beneficial for all the other important aspects of your life, such as improved cardio-respiratory fitness, blood pressure, bone density, muscle volume (directly correlated to BMR) and general feeling of well-being when physically exerting oneself on a regular basis.

Also, as you start to lose fat mass, you want your underlying body to be in shape and so by exercising regularly combined with your nutritional plan, you will maximise the results you are after (lean and toned).

Aerobic exercise to maintain/improve BMR when trying to lose weight.

Those who want to lose weight (fat) often are drawn to the cardio rooms as they see this option as the way of quickly and easily achieving their goals. (often with the misunderstanding that low to moderate aerobic exercise directly burns fat rather than engaging in high intensity exercise (where appropriate) to burn carbohydrates (but with a greater total energy expenditure – which is all that matters in the end – see last week's blog article [HIIT v's LISS \(Glycogen vs Fat usage during exercise\)](#)).

Unfortunately this has limited returns as highlighted in this study:

'It appears that the combination of a large quantity of aerobic exercise with a very low calorie diet resulting in substantial loss of bodyweight may actually accelerate the decline in resting metabolic rate. These findings may cause us to re-examine the quantity of exercise and diet needed to achieve optimal fat loss and preservation of resting metabolic rate'. (5)

There is a proportional relationship b/w the decrease in resting metabolism to the loss of the metabolically active tissue (muscle). This highlights that if you are looking at trying to get lean – then strength training (rather than just cardio) is important in both total calorie burn as well as maintaining muscle mass (which is highly influential upon BMR). (6)

Next article I will address the TDEE factors that we control – in particular some comments around NEAT.

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