

## **Understanding RMR and Metabolism**

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(based on Dan's article originally published in the book *The Power of Champions*)

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We often hear from clients that they think they have a “slow metabolism”. It is beneficial to make sure they understand what “metabolism” means and how lifestyle and exercise choices may affect their ability to reach their body composition goals.

What is metabolism? It is ALL the reactions that take place in the body that involve the transformation of energy. It is the process of combining nutrients with oxygen to release the energy needed to function. Metabolic reactions are either anabolic or catabolic. Catabolic reactions release energy, usually by breaking larger molecules into smaller molecules, anabolic reactions require the addition of energy, such as building muscle and bone. Every movement, every reaction requires energy. The total expenditure of these reactions is measured in kilocalories, which we refer to as calories. This number is the total energy requirements of their individual metabolism.

The largest percentage of total metabolism is RMR, or Resting Metabolic Rate. This typically represents 60-75% of the total metabolic rate. We refer to this as “the minimum amount of energy required to maintain the machine”.

Additional metabolic demands come from the thermic effect of food, which is the amount of energy required to digest the food consumed. This can account for about 10-15% of the total.

The balance of caloric need comes from activity level, which is the easiest variable to manipulate. We can directly increase our need for energy by increasing our activity levels. Done correctly, we can create a calorie deficit that will require more efficient fat assimilation to resolve. Resistance training can increase the “value” of lean mass, resulting in slightly higher post exercise oxygen consumption, and reduced breakdown of lean tissue to supplement calories.

RMR represents, in calories, the daily amount of energy required by your body to sustain the metabolically active tissues while in a resting state. The number is used to represent average daily calorie requirement, based on sixteen hours sitting still and eight hours of restful sleep. This does not always accurately represent a person's RMR, however. Certain situations can affect RMR include fever, overtraining, poor sleep, illness, obesity, certain medicines, supplements, poor digestion, restricted calorie diets, rapid weight loss, etc. All of these must be taken into consideration.

There are a couple commonly used methods for determining approximate RMR. Trainers routinely use the ACSM guidelines, using body composition and activity measurements. Dietitians have used the Harris-Benedict Equation, using height, weight, age, and gender. These formulas have limitations; we have seen them off by 18-25% with some clients. They are still considered fairly accurate for most people. The most accurate method we have encountered is using an indirect calorimeter to measure actual oxygen consumption. It gives an accurate baseline, with consistent, repeatable results.

Lean mass is the highest percentage of RMR. Lean mass is more than just muscle. It is ALL metabolically active tissues and systems in the body, including the central nervous system, respiratory, vascular, endocrine, and digestive and lymphatic systems. Bones, too! All systems require energy, in varying levels, to be maintained. What happens when the caloric consumption is below their RMR for an extended period of time? A reduction in system efficiency! All the systems NEED to be fed! Even stored adipose tissue requires some energy. Consistently consuming less than RMR will result in a reduction in lean mass, reduced digestive efficiency, reduced performance, slower recovery, hindered immune system function, restless sleep, hormonal imbalance, and a higher risk for injury.

This is often seen in low calorie diets. Below RMR, the body makes lean tissue available to supplement caloric deficit. The loss of lean tissue results in a lower RMR (less mass to feed), and reduced metabolic functioning. Extreme low calorie eating does not necessarily use fat to make up this deficit. Instead, lean tissue is sacrificed. It is an easier conversion, requiring less energy, it also lowers RMR to closely match intake. The result of this is the new RMR may be low enough that normal eating patterns will result in large calorie surplus, potentially quick weight gain, primarily as body fat.

Lean mass generally does not increase unless the skeletal muscles are stressed sufficiently to require it (as through resistance training).

Adding up our RMR, the thermic effect of food, projected activity level, and body composition goals can give us a daily calorie target. When we know what we need to have, we can plan to make the most of our eating. We know that there are thermic benefits to eating smaller, more frequent meals. It is also easier to digest, and more efficiently absorbed. Most people can efficiently digest 500-700 calories at a time. Eating more calories than that at one sitting is similar to putting thirty gallons of gasoline in a twenty gallon tank. It is a waste of fuel, a waste of money, and it is bad for the environment (in this case, adding to stored body fat). The same thing applies to food. If it is not necessary, it is easier to NOT eat it, than to try to work it off later! Something to think about: before your body starts to burn fat, teach it not to store more!

Large meals require more blood and energy for digestion, which will leave the body feeling lethargic and tired. Less blood and energy is available to the limbs and muscles, and that will result in a decrease in activity. Activity is the best way to increase our metabolic requirements. Daily activity accounts for about 10-20% of our metabolism.

Eating based on the body's need for food for a given time period makes for efficient meal planning. For example, someone needing 2400 calories per day to meet their metabolic needs could easily figure 400 calories per meal, at six evenly spaced meals per day.

Since it is not practical to eat exactly the same amount per meal, we recommend that our clients try to make their meals provide fuel proportionate to their need for fuel. Metabolic rates are lower when we sleep, higher upon waking, and can be sustained at an elevated level by trying to eat based on need. An easy meal plan is to provide for three meals, with dinner being slightly lower in calories than breakfast and lunch, to match the normal decline in metabolism towards evening, and three snacks to maintain energy requirements and lessen the tendency to overeat at the next meal. Healthy food choices are important! If the body is going to go to all of the trouble to break down the food for fuel, it should benefit from the compounds and micronutrients supporting the calories.

Applying an automotive example, think of food as fuel for your daily journey. It would be easier if we could just put all our fuel for a long trip into the car at once. We could drive without stopping! Unfortunately, we have to plan for our fuel stops because we know we can only go a set amount on a tank of gas. Too little fuel, we end up on the side of the road. Since we cannot put in more fuel than our tank will allow, we have to accept the limitations of the design.

It is the same with eating for fat loss. It would be easy to just eat one meal for the day, addressing all our total energy needs, and force our body to burn fat for the remainder of the day. Unfortunately, it does not work that way! We have to provide enough fuel to take care of the daily activities, the detours, and occasional side trips. The best way is to not waste fuel, and plan ahead. Use enough to get to your destination, and enjoy life along the way. Eating just enough to maintain an anabolic environment promotes better fat assimilation, and reduced fat storage.

We offer metabolic testing at our private studio as an accurate method of establishing individual RMR. This small, non-invasive test gives our clients valuable information for maximizing their exercise and eating for weight management. The small expense for the test is easily offset in less wasted time and wasted food. We encourage our clients to enjoy their food but recognize it as fuel for the body. Feed it!

Total metabolic requirements determine fuel demand. Add to that personal goals, exercise tolerance and recovery ability, and we can develop a plan that will work for everybody.