



Basal Metabolic Rate (BMR) & Eating Plan

It may seem obvious when exercising or engaging in physical activity our bodies are burning calories, but did you know while resting you're also burning calories? This is called the basal metabolic rate. Basal Metabolic Rate (BMR) is the amount of energy used to simply stay alive in the absence of any physical activity. You may have heard the BMR also called the Resting Metabolic Rate (RMR) or Resting Energy Expenditure (REE). These are used interchangeably; however, RMR and REE are more specific to rest.

Basal Metabolic Rate (BMR)

As your body rests, it still burns calories to perform the basic functions to sustain life. The BMR is the number of calories your body needs to accomplish the following: Breathing, Circulation, Nutrient Processing, and Cell Production.

Estimating Your BMR

If you are wondering how to measure your BMR, don't worry. You can easily calculate this with the Harris-Benedict Formula or visit this <https://www.active.com/fitness/calculators/bmr>. The Harris-Benedict Formula takes into account your weight, height, age, and gender.

Women: $BMR = 655 + (4.35 \times \text{weight in pounds}) + (4.7 \times \text{height in inches}) - (4.7 \times \text{age in years})$

Men: $BMR = 66 + (6.23 \times \text{weight in pounds}) + (12.7 \times \text{height in inches}) - (6.8 \times \text{age in years})$

How Many Calories Do You Need to Maintain Your Weight

After you have estimated your BMR, the next step is to include the number of calories burned throughout your day based on your lifestyle activities. The final number is an estimate of the daily calories you need to maintain your weight.

- If you are sedentary (little or no exercise): $\text{Calorie-Calculation} = BMR \times 1.2$
- If you are lightly active (light exercise/sports 1-3 days/week): $\text{Calorie-Calculation} = BMR \times 1.375$
- If you are moderately active (moderate exercise/sports 3-5 days/week): $\text{Calorie-Calculation} = BMR \times 1.55$
- If you are very active (hard exercise/sports 6-7 days a week): $\text{Calorie-Calculation} = BMR \times 1.725$
- If you are extra active (very hard exercise/sports & physical job or 2x training): $\text{Calorie-Calculation} = BMR \times 1.9$

Can I Change My BMR?

Your BMR is determined by several factors. Some of these include: Sex, Weight, Height, Age, Ethnicity, and Genetic Factors. While many of these are unchangeable, you still are able to take proactive steps to changing your body composition through weight loss and increasing muscle mass.

Calculating your BMR and understanding this number is a great way to begin your new, healthy lifestyle. Your BMR helps determine the amount of calories you should be consuming throughout the day. It gives better insight to your body's metabolism. If you increase your physical activity you can increase the amount of caloric intake needed for the day. The more intense the exercise, the longer the increased metabolism rate. At the minimum, you should get 30 minutes of aerobic exercise 4 or 5 times a week and do strength-training at least 3 times a week to increase lean muscle. Lean muscle uses more calories than fat when exercising. Overall, your BMR is a great place to start determining what kind of nutrition and physical activity you need to meet your goals.

The chart below can help you plan your food intake to match your calorie budget.

The number of daily servings in a food group vary depending on caloric needs ^a								
Food Group ^b	1,200 Calories	1,400 Calories	1,600 Calories	1,800 Calories	2,000 Calories	2,600 Calories	3,000 Calories	Serving Sizes
Grains	4-5	5-6	6	6	6-8	10-11	12-13	1 slice bread 1 oz dry cereal ^c ½ cup cooked rice, pasta, or cereal ^c
Vegetables	3-4	3-4	3-4	4-5	4-5	5-6	6	1 cup raw leafy vegetable ½ cup cut-up raw or cooked vegetable ½ cup vegetable juice
Fruits	3-4	4	4	4-5	4-5	5-6	6	1 medium fruit ¼ cup dried fruit ½ cup fresh, frozen, or canned fruit ½ cup fruit juice
Fat-free or low-fat milk and milk products	2-3	2-3	2-3	2-3	2-3	3	3-4	1 cup milk or yogurt 1½ oz cheese
Lean meats, poultry, and fish	3 or less	3-4 or less	3-4 or less	6 or less	6 or less	6 or less	6-9	1 oz cooked meats, poultry, or fish 1 egg
Nuts, seeds, and legumes	3 per week	3 per week	3-4 per week	4 per week	4-5 per week	1	1	½ cup or 1½ oz nuts 2 Tbsp peanut butter 2 Tbsp or ½ oz seeds ½ cup cooked legumes (dried beans, peas)
Fats and oils	1	1	2	2-3	2-3	3	4	1 tsp soft margarine 1 tsp vegetable oil 1 Tbsp mayonnaise 1 Tbsp salad dressing
Sweets and added sugars	3 or less per week	3 or less per week	3 or less per week	5 or less per week	5 or less per week	< 2	< 2	1 Tbsp sugar 1 Tbsp jelly or jam ½ cup sorbet, gelatin dessert 1 cup lemonade
Maximum sodium limit^d	2,300 mg/day	2,300 mg/day	2,300 mg/day					

Maintaining Healthy Weight

Weight maintenance is definitely a balancing act between calories consumed and calories burned. It takes 3500 calories to make a pound of body weight. To get rid of a pound of extra weight, you have to either eat 3500 fewer calories or burn up 3500 extra calories. The best way is to do a combination of reducing the calories by making wise food choices and increasing your activity to use the calories faster. On average, a person burns 350 to 500 calories when they walk 10,000 steps. At 10,000 steps a day, you can burn as many as 500 calories. If you do that for 7 days, you have used up 3500 calories.

Once you reach your desired weight, what does it take to successfully maintain. A survey was recently conducted by Consumer Reports of 21,632 readers about their lifetime weight history and eating, dieting, and exercise habits. They found 6 key behaviors that made the difference in successful weight loss and maintenance:

1. Control portion size at each meal.
2. Restricting fat to no more than one-third of daily calories.
3. Eat five or more servings of fruits and vegetables daily.

4. Choose whole grain breads, cereals and other grains over refined grains.
5. Eat at home. As the number of days increased for eating out, so did the person's weight.
6. Participate in regular, vigorous exercise at least 30 minutes or longer each day.

Additional Resources:

<https://www.active.com/fitness/calculators/bmr>

<http://www.bmi-calculator.net/bmr-calculator/harris-benedict-equation/>

https://www.cdc.gov/pcd/issues/2011/may/10_0091.htm





Diet and Exercise Bullets

One of the common goals participants in this health challenge set is weight loss. There is an abundance of advice about what is most effective, and a variety of research studies have been conducted to see if eating at certain times of day, combining certain types of foods, length and level of activity, type of activity, etc. have an effect. In the end, successful weight loss all boils down to what works best for your body and includes consistently incorporating healthy foods and physical activity. Here are a few things to also consider:

- Combining strength training or resistance exercise with aerobic activity for weight loss creates better long term results than aerobic activity alone. Strength training tends to build muscle so there is minimal loss of lean muscle and increases loss of body fat. It also protects against lowering metabolic rate which can occur when calories are restricted.
- Fat-burning: Your body can use all macronutrients (carbohydrates, protein and fat) as energy, but carbohydrates are generally the first and preferred fuel for your cells. The percentage of fuel your body gets from breaking down fat versus carbohydrates increases as your workout time increases. BUT... the point when your body switches from burning carbs to fat varies greatly depending on many factors. Also note exercising at a low to moderate rate burns fat as an energy source at a higher percentage than at a high intensity rate, but the higher intensity will end up burning more calories and fat overall. Consistently including aerobic exercise can help your body develop better fat burning capabilities. "To burn more fat, burn more calories" - whether that means harder, longer or a combination of both.
- Drink water and stay hydrated. Water can help you feel full and curb the temptation to snack or overeat. It aids in metabolizing stored fat and carbohydrates. When it comes to physical activity, water helps muscles, connective tissues and joints move correctly and your lungs, heart and other organs work effectively so you can avoid muscle cramps and fatigue, loss of coordination, and maintain body temperature.
- Eat breakfast that includes a lean source of protein. Breakfast breaks the overnight fasting period, jumpstarts your metabolism, replenishes your glucose supply (an important energy source for your body), and supplies essential nutrients to keep you going throughout the day. Various studies have found breakfast benefits include: lower BMI (Body Mass Index), consume less fat through the day, meet fruit and vegetable recommendations, higher fiber and calcium intake, better memory and attention.
- Consistently eat at least three times a day. Research tends to show that the heavier people are, the less often they eat. Eating at least three meals helps curb hunger, can boost your metabolism, and assists in including healthier foods and a larger variety.
- The best eating plan for losing weight is one that is good for all parts of your body from your brain to your toes; one you can live with for a long time; offers tasty and healthy choices; restricts very few foods and doesn't require extensive and expensive foods or supplements. A new post on the Live Smart Colorado blog helps explain this point:
<https://livesmartcolorado.colostate.edu/the-best-diet-for-2020/>



Basal Metabolic Rate

Applying the Lesson

Choose one of the following activities to apply what you learned about your health and your healthy goal setting. Write a short paragraph (3 to 5 sentences) to describe what you did and learned from the activity selected. Report your Applying the Lesson results by Online form, email, fax or hard copy to your county Extension Office.

Option 1: Following the Harris-Benedict formula or utilizing a BMR calculator, determine your BMR. Did this number seem surprising to you? In what way? What are some ways you can affect positive change in your BMR?

Option 2: Review the daily lifestyle activities above. Where are you on the activity scale? If you are sedentary, what are some simple ways to increase your daily activity? If you are very active, what are some of the daily activities you engage in? How does this level of activity affect your BMR?

Option 3: From the Diet and Exercise Bullets, what one item do you want to focus on for a behavior change?