Personal Health Portfolio

Chapter 7 What Are Your Daily Energy Needs?

You can *estimate* your daily energy needs by (1) determining your basal metabolic rate (BMR) and (2) determining your energy expenditure above BMR from physical activity. Combining the two numbers gives you an estimate of your total energy requirement. This will require fine-tuning based on your body composition, metabolism, and activity and is intended as a start.

1. First, estimate your BMR, the minimum energy required to maintain your body's functions at rest. Begin by converting your weight in pounds to weight in kilograms. Then multiply by the BMR factor, which is estimated at 1.0 calorie/kg/hour for men and 0.9 for women. Then multiply by 24 hours to get your daily energy needs from BMR.

   - Let's look at Gary, a 30-year-old, 180-pound man.

   $$\frac{180 \text{ lb}}{2.2 \text{ lb/kg}} = 82 \text{ kg}$$

   $$82 \text{ kg} \times 1 \text{ calorie/kg/hour} = 82 \text{ calories/hour}$$

   $$82 \text{ calories/hour} \times 24 \text{ hours/day} = 1{,}968 \text{ calories/day}$$

   Gary's BMR—the energy he uses every day just to stay alive—is 1,968 calories.

   - Now let's look at Lisa, a 24-year-old, 115-pound woman.

   $$\frac{115 \text{ lb}}{2.2 \text{ lb/kg}} = 52 \text{ kg}$$

   $$52 \text{ kg} \times 0.9 \text{ calorie/kg/hour} = 47 \text{ calories/hour}$$

   $$47 \text{ calories/hour} \times 24 \text{ hours/day} = 1{,}128 \text{ calories/day}$$

   Lisa's BMR is 1,128 calories per day.

   - Now calculate your own BMR.

   Your weight in lbs _____ /2.2 lb/kg = _____ kg

   _____ kg 1 (men) = _____ calories/hour

   _____ kg 0.9 (women) = _____ calories/hour

   _____ calories/hour 24 hours/day = _____ calories/day

2. Next, estimate your voluntary muscle activity level. The following table gives approximations according to the amount of muscular work you typically perform in a day. To select the category appropriate for you, think in terms of muscle use, not just activity.

Lifestyle	BMR factor
Sedentary (mostly sitting)	0.4–0.5
Lightly active (such as a student)	0.55–0.65
Moderately active (such as a nurse)	0.65–0.7
Highly active (such as a bicycle messenger or an athlete)	0.75–1

   A certain amount of honest guesswork is necessary. If you have a sedentary job but walk or bicycle to work every day, you could change your classification to lightly active (or even higher, depending on distance). If you have a moderately active job but spend all your leisure time on the couch, consider downgrading your classification to lightly active. Competitive athletes in training may actually need to increase the factor above 1.

   - Let's assume that Gary works in an office. He does walk around to talk to coworkers, go to the cafeteria for lunch, make photocopies, and does other everyday activities. We'll assess his lifestyle as sedentary but on the high side of activity for that category, say 0.5. To estimate Gary's energy expenditure above BMR, we multiply his BMR by this factor:

   $$1{,}968 \text{ calories/day} \times 0.50 = 984 \text{ calories/day}$$

   - Let's assume that Lisa works as a stock clerk in a computer store. She spends a lot of time walking around and sometimes lifts fairly heavy merchandise. She doesn't own a car and rides her bike several miles to and from work each day and also for many errands, so she's at the high end of moderately active, say 0.7. To estimate Lisa's energy expenditure above BMR, we multiply her BMR by this factor:

   $$1{,}128 \text{ calories/day} \times 0.70 = 790 \text{ calories/day}$$

   Note that although Lisa is much more active than Gary, she uses less energy because of her lower body weight.

   - Now calculate your own estimated energy expenditure from physical activity.

   _____ calories/day × BMR factor _____ = _____ calories/day

3. To find your total daily energy needs, add your BMR and your estimated energy expenditure.

   - For Gary, this is

   $$1{,}968 \text{ calories/day} + 984 \text{ calories/day} = 2{,}952 \text{ calories/day}$$

   - For Lisa, it is

   $$1{,}128 \text{ calories/day} + 790 \text{ calories/day} = 1{,}918 \text{ calories/day}$$

Because several estimates are used in this method, total daily energy needs should be expressed as a 100-calorie range roughly centered on the final calculated value, which would be about 2,900–3,000 calories/day for Gary and about 1,870–1,970 calories/day for Lisa.

- Now calculate your total daily energy needs.

BMR calories/day _____
+ physical activity calories/day _____
= _____ total calories/day

Finally, compare your daily energy needs with your daily calorie intake. You may want to refer to the Chapter 5 Personal Health Portfolio activity, where you recorded your calorie intake for one day.

Your daily energy needs: _____

Your daily calorie intake: _____

Remember, if you want to lose weight, you need to take in less energy than you use up. You can shift the balance by increasing your activity level or decreasing your food intake. Moderate changes in both intake and activity level are the safest way to lose weight.

CRITICAL THINKING QUESTIONS

1. How do your calorie needs and calorie intake match up? Are you balancing your needs with your intake, or is one higher than the other? Do you need to make any changes to your calorie intake and/or your energy expenditure?

2. What factors influence how well you are able to balance your food intake and energy expenditure? Consider your taste in food and its cost and convenience. Also consider the factors that influence your ability to get daily physical activity, such as your available leisure time, your community's walkability and safety, availability of recreation areas, affordability of the campus gym or local gyms, etc.