

Name: _____ Date: _____ Ambient heart rate: _____

When you exercise, you burn a blend of fuels, a combination of fat, protein, and carbohydrate. The ratio of these fuels depends on a number of factors, such as how fit you are, how hard you exercise, your diet, and whether you eat or drink during the workout.

You can determine the number of calories you will burn if you know the activity, the duration, and your body weight. By determining the burn rate and multiplying it by the number of minutes you exercise, you can calculate your total caloric expenditure. Knowing this, you can more easily shift the energy equation by changing these variables.

Once you understand burn rate and fuel ratios, you will be able to design a successful weight management program. Of course, this will be easier if you know the four basic steps that shift the energy equation:

1. Setting measurable, attainable, realistic, and timely weight loss goals
2. Shifting the energy equation to increase the burn rate and increase your metabolic rates
3. Designing a training program within your individual fat-burning range
4. Developing a behavior modification program to change your eating habits and attitudes

Instructions

The number of calories you burn during any physical activity depends on a number of factors, the most important of which are these:

- Exercise intensity (heart zone)
- Body weight
- Type and quantity of food eaten
- Type of activity
- Duration of exercise

Circle your approximate body weight along the top of the following table. Going down this column, see how many calories you will burn per minute performing the activities listed on the left. For example, if you weigh 190 pounds, the calories you would burn by playing basketball would be 11.9 per minute. If you were to

play basketball for 60 continuous minutes with no time-outs, you could estimate that your calorie expenditure for the time is as follows:

$$60 \text{ (minutes of basketball)} \times 11.9 \text{ (calories per minute)} = 714 \text{ (total calories burned)}$$

DETERMINING CALORIES BURNED DURING PHYSICAL ACTIVITY

Activity	Burn rate per minute per pound*	BODY WEIGHT (LB)				
		110	130	150	170	190
Swimming	0.071	7.8	9.2	10.6	12.0	13.4
Cycling	0.077	8.5	10.0	11.5	13.0	14.5
Running	0.088	9.7	11.4	13.1	14.9	16.6
Basketball	0.063	6.9	8.1	9.4	10.6	11.9
Aerobic dancing	0.061	6.7	7.9	9.2	10.4	11.6

*All activities are set at approximately 70 to 80 percent of MHR in zone 3. Burn rate varies among people; this is only an estimate of calories burned per minute.

Fat, protein, and carbohydrate are metabolized in every zone. The ratio of these fuels changes based on a number of factors, but the most important is the intensity of the workout. The most accurate way to calculate the calories burned for various activities is to use an exercise science laboratory; however, it is possible to estimate calories burned with a heart rate monitor.

ESTIMATES OF CALORIES FROM FAT AND CARBOHYDRATE BURNED DURING PHYSICAL ACTIVITY

Zone	Percentage of fat	Percentage of carbohydrate	Fat calories burned	Carbohydrate calories burned	Total calories burned
SWIMMING					
5	10	90			
4	20	80			
3	55	45			
2	65	35			
1	90	10			
CYCLING					
5	10	90			
4	20	80			
3	55	45			
2	65	35			
1	90	10			

Questions

Which activity (cycling or swimming) burns the most calories in 30 minutes? Why?

What could you do to change the number of calories burned per minute in each activity?

In what heart zone do you burn the most total calories and the most calories from fat?

During aerobic dance, how many calories does a person who weighs 100 pounds burn per minute? What about someone who weighs 210 pounds?