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FAT CITY

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Hosted by Roger Bingham, KCET

Teacher's Guide

by Linda S. Eck, M.B.A., R.D.

STUDY GUIDE

by Linda S. Eck, M.B.A., R.D.

INTRODUCTION

FAT CITY is about fat, the way Americans overdo the amount of fat consumed, how lifestyles and metabolic rates have changed, and current scientific theories on obesity.

In the United States some 10 to 25 percent of all teenagers and some 25 to 50 percent of all adults are obese. According to surveys, this number is rising. Obesity is one of the most common problems that Americans face today.

At any one time about a quarter of the population is on a diet. These people spend more than \$80 million a year in search of a way to lose weight. The Health, Weight, and Stress Program at Johns Hopkins University has gathered more than 29,000 purported methods of losing weight. Less than six percent of those methods have been found effective or even safe. Thirteen percent were considered dangerous.

Although obesity does not necessarily cause health conditions, it can aggravate such conditions as high blood pressure, cardiovascular problems, liver disorders, and arthritis. Fat people more often have high blood cholesterol (a risk factor for coronary heart disease), hypertension, complications after surgery, gynecological irregularities, and toxemia of pregnancy. For men, the risk of cancers of the colon, rectum, and prostate gland rises with obesity. For women, the risks of cancers of the breast, uterus, ovaries, gallbladder, and bile ducts is greater. Obesity is often found in conjunction with Type II diabetes.

In general, two schools of thought address the causes of obesity. One attributes obesity to internal causes; the other, to environmental factors. One internal cause is the set-point theory. Some researchers have suggested that the body wants to maintain a certain amount of fat and regulates eating behaviors and hormonal actions to defend its "set

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point." Researchers suggest that environmental factors are present because we are pushed to overeat by factors in our surroundings. Foremost among the factors is the availability of a multitude of delectable foods. Some cultures have made changes in their lifestyle and eating habits which are not always advantageous to improved health. The Pima Indians are representative of obesity problems which affect various cultural groups.

Currently about 37 percent of the calories consumed in a day come from fat and less than 40 percent come from fruits, vegetables and grains. The dietary goals in the United States include a diet with not more than 30 percent of calories coming from fat and at least 50 percent of calories coming from carbohydrates (fruits, vegetables, and grains).

A diet based on the Four Food Groups is a simple way to get the nutrients the body needs and still keep calorie levels low enough to lose weight. Daily intake should include at least two servings from the meat and meat alternatives group, two servings from the milk and milk products group, four servings of fruits and vegetables, and four servings of grains (bread and cereal products). Servings size of foods also plays a part in the diet. More is not always better.

Calories can come from four different sources in the diet. Fat supplies nine calories per gram. Alcohol supplies seven calories per gram. Protein and carbohydrates supply four calories per gram.

Over 40 percent of the U.S. population is physically inactive. Even though studies indicate that Americans today eat fewer calories than they did 50 years ago, physical activity has declined drastically since that time.

Physical activity burns calories, can increase the basal metabolic rate, and decreases the appetite. The American College of Sports Medicine has recommended that individuals should exercise at least three times a week for at least 20 minutes of continuous aerobic activity. Exercising should be at 60-90 percent of the maximum heart rate.

GLOSSARY

arteriosclerosis – condition characterized by a thickening and hardening of the walls of the arteries and a resultant loss of elasticity.

atherosclerosis – a type of arteriosclerosis in which lipids, especially cholesterol, accumulate in the arteries and obstruct blood flow.

essential fatty acid – a fatty acid that the human body cannot manufacture and that must be supplied by the diet, as it is necessary for growth and maintenance.

fat – an organic compound whose molecules contain glycerol and fatty acids; fat insulates the body, protects organs, carries fat-soluble vitamins, is a constituent of cell membranes, and makes food taste good.

fatty acid – a simple lipid - containing only carbon, hydrogen, and oxygen - that is a constituent of fat.

high-density lipoprotein (HDL) – a lipoprotein that acts as a cholesterol carrier in the blood; referred to as “good” cholesterol because relatively high levels of it appear to protect against atherosclerosis.

hypertension – a condition in which a person has a higher blood pressure than that judged to be normal.

lipid – broad term for fats and fatlike substances in the body or in food that are insoluble in water.

lipoprotein – compound composed of a lipid (fat) and a protein that transports both in the bloodstream.

lipoprotein lipase – an enzyme mounted on the surface of fat cells (and other cells) that hydrolyzes triglycerides passing by in the bloodstream, and directs their parts into the cells where they can be reassembled for storage.

low-density lipoprotein (LDL) – a lipoprotein that acts as a cholesterol carrier in the blood; referred to as “bad” cholesterol because relatively high levels of it appear to enhance atherosclerosis.

metabolic rate – the rate of utilization of energy. This is usually measured at a time when the subject is completely at rest and in a fasting state. Energy used is calculated from the amount of oxygen used during the test. Sometimes referred to as basal metabolism or basal metabolic rate (BMR).

metabolism – all the chemical changes that occur from the time nutrients are absorbed until they are built into body substances or are excreted. This term includes both anabolism (building up of a cell for growth and repair) and catabolism (breaking down complex substances and releasing energy).

obesity – abnormal amount of fat on the body. This term is usually not employed unless the individual is from 20-30% over average weight for his or her age, sex, and height.

polyunsaturated fatty acids – a fatty acid in which two or more carbon atoms have formed double bonds, with each holding only one hydrogen atom.

saturated fatty acid – a fatty acid in which carbon is joined with four other atoms; i.e. all carbon atoms are bound to the maximum possible number of hydrogen atoms.

set point – the point at which controls are set (for example, on a thermostat). In the case of body weight, the set point is that point above which the body tends to lose weight and below which it tends to gain weight.

ADDITIONAL RESOURCES

Nutrition and Your Health: Dietary Guidelines for Americans. Third Edition, 1990. U.S. Dept. of Agriculture.

Diet and Health Report. 1989. National Research Council of the National Academy of Sciences.

The Surgeon General's Report on Nutrition and Health. 1988. U.S. Public Health Service.

Set Point Diet: Gilbert Leveille. 1985. Random House.

Nutrition and Modern Lifestyles. Dairy Council Digest, September/October 1988.

Prescription for Lower Chronic Disease Risk: Less Fat and More Fruits, Vegetables, and Complex Carbohydrates. National Research Council, March 1, 1989, pp. 1-6.

Do You Know Your Cholesterol Level? Dale Blumenthal. FDA Consumer, March 1989, pp. 24, 26-27.

Saturated Fats and Cholesterol. Elizabeth M. Whelan, Sc. D., M.P.H. Priorities, Spring 1989, pp. 43-44.

1990 Health Objectives on Obesity. Obesity & Health, formerly International Obesity Newsletter, January 1988, pp. 1-3.

American Dietetic Association, 216 W Jackson Blvd., Suite 800, Chicago, IL 60606-6995.

American Heart Association - local chapter
American Cancer Society - local chapter

DISCUSSION QUESTIONS

1. Are Americans losing the battle of the bulge? Why?
2. How can we increase our metabolism?
3. What diseases are common in an overweight population?
4. How have our lives changed from those of our parents, grandparents, and great grandparents?

5. How has the food consumed changed from that eaten by our parents, grandparents, and great grandparents?
6. What are the best steps to take to lose weight?
7. Why is the Pima Indian tribe having problems with obesity?
8. What are the benefits of increased physical activity in a weight loss program?
9. What are the dietary goals regarding fat intake?
10. Which foods supply fat in abundance? in moderation? not at all?

AREAS TO EXPLORE

1. Interview people 20, 40, and 60 years older than you are to find out what life was like, what kind of exercise they got, and what kind of foods they ate when they were your age.

2. Keep a food log for two weeks. Remember to log the amount as well as the food eaten. Determine how much fat you are consuming and how you could decrease that amount.

3. Keep an exercise log for two weeks. Determine ways to increase your exercise.

4. Learn more about the Pima Indian tribe of Salt River Reservation in Arizona.

5. Find four weight loss programs and evaluate them for long term use to decrease obesity.

6. Invite a Registered Dietitian (R.D.), Registered Nurse (R.N.), or doctor to speak to your class about the diet and health related concerns of the students.

7. Test foods to determine if fat is hidden in them. Fold a strip of brown paper to make sections. Mark each section with a number. Have food numbered on a tray. Rub food on the paper in the numbered order. If grease/oil stain remains after 5 minutes, the food has hidden fat.

8. Read food labels to determine the amount of fat in the foods commonly eaten.

9. Determine your target heart rate. The maximum heart rate is approximately 220 beats per minute minus the person's age. Target heart rate is 60-90 of that number.

10. Estimate your energy needs.

a. Basal Metabolism. Use the factor 1.0 kcalories per kilogram of body weight per hour for men, or 0.9 for women. Example (150 pound man)

1) change pounds to kilograms:

150 lb. divided by 2.2 lb/kg equals 68 kg.

2) multiply weight in kg by the BMR factor:

68 kg x 1 kcal/kg/hr equals kcal/hr.

3) multiply the kcal used in 1 hour by the hours in a day: 68 kcal/hr x 24 hr/day equals 1,632 kcal/day

Energy for BMR equals 1,632 kcal/day

b. Voluntary Muscular Activity. The following figures are approximations based on the amount of muscular work a person typically performs in a day. To select the one appropriate for you, remember to think in terms of the amount of muscular work performed. Don't confuse being busy with being active.

- for sedentary (mostly sitting) activity (a typist), add 40 to 50 percent of the BMR.

- for light activity (a teacher), add 55 to 65 percent.

- for moderate activity (nurse), add 65 to 70 percent.

- for heavy work (a roofer), add 75 to 100 percent or more.

If the man used for an example worked in data entry, we could estimate the energy he needs for physical activities by multiplying his BMR by 50 percent: 1,632 kcal/day x 50% equals 816 kcal/day.

Energy for activities equals 816 kcal/day.

Total Energy. Add BMR and activity calories together to determine total calories used in one day. Express needs as falling within a 100 kcal range.

1,632 kcal/day plus 816 kcal/day equals 2,448 kcal/day equals 2,400 to 2,500 kcal per day.