



ADOLESCENT OBESITY

Curriculum Unit 91.05.05
by Lynn Marmitt

Along most city streets it is hard to miss the fast-food restaurants on every block; McDonalds, Burger King, Wendy's and Roy Rogers, just to name a few. What do these places offer? For most it's a quick, calorie laden meal often containing enough fat to fulfill an entire day's allotment. Adolescents are particularly vulnerable to these places and for the inner city child this is often their "special" dinner out. Just as fast-food restaurants attract the adolescent population, so does the constant bombardment of advertisements. The sole purpose of advertising is to entice and persuade individuals to buy products. Advertisements for candy, gum, soda, snacks and fast foods target the youth market and can influence food beliefs and eating patterns. Commercials tend to encourage snacking between meals.

In the 1990's, "thin is still in." Messages in advertising emphasize paying close attention to body-image, limiting fat intake, cutting calories and exercising. Yet with all the focus on maintaining a healthy body there still exists a considerable number of individuals who are either overweight or obese. Adolescents, at a critical period in their lives, are receiving mixed messages from advertising and media. Advertisements use popular and thin heroes and actors to sell their products. Messages associated with feelings of popularity are conveyed and thus the image sells the product. Studies on the effects of television advertising on the general population conclude that television presents viewers with two sets of conflicting messages. One suggests that we eat in ways almost guaranteed to make us fat; the other suggests that we strive to remain slim.¹ Education about proper nutrition and health hazards associated with too much weight is essential, particularly in the urban areas where this information is often lacking in the home.

I have been amazed and concerned by the fact that so many of my students are considerably overweight. I see the students fill up and enjoy a sugar-packed breakfast and a rich carbohydrate lunch. Vegetables seem to be a mystery! An increased appetite is normal during adolescence and food sometimes becomes a passion for these students. Some adolescents are concerned about their body image, dieting and exercising relentlessly. Others rely on food as an emotional outlet. Obesity is a common eating disorder associated with adolescence. Obesity can weaken physical health and well-being and can shorten life expectancy. The condition can lead to social disabilities and unhappiness which may cause stress and even mental illness. The physiological and psychological factors influencing obesity vary and will be discussed throughout this unit. The development of a personal identity and body image is a major goal for adolescents and educators need to address this issue and provide a support system for students.

In this unit, ADOLESCENT OBESITY, I will discuss the psychological, social and health factors involved and the

available resources for teenagers. The student activities will include lessons on nutritional needs, planning a balanced diet and exercise program, deciphering food labels and developing a positive self-image and a healthy lifestyle. In developing this unit for students in grades five through eight, I have designed the unit to complement the study of the human body and health issues, taking approximately three weeks to complete.

The first section of this unit will discuss the genetic and physiological background associated with obesity.

Obesity can be defined as an excessive accumulation of body fat which results in individuals being 20% or more heavier than their ideal body weight. Overweight is defined as any weight in excess of the normal range. Obesity results in an increase in the size of the adipose tissue. The adipocytes are a group of special cells that contain fat. These fat cells are developed at certain points of human growth. During infancy, adolescence and pregnancy the body's potential for fat cell development is mobilized and adipose tissue is made at a faster rate than at any other times during life. The growth depends upon nutritional and environmental factor.² The adipose tissues are sensitive to nutritional changes and need to be balanced since they are used as storage bins for fat. In studies done on these cells, it appears that larger cells constitute obesity. It also seems that adipocytes from a fat person do not release fat as easily as adipocytes from a thin person. Scientists have found that the development of too many fat cells during childhood may signal the beginning of a lifelong weight problem and that fat cells, once acquired last forever.³ The size of these cells can be reduced by limiting calories but it is almost impossible to reduce the number of cells. Therefore these cells cannot withstand a large "energy in" and a small "energy out." When this occurs, we see a rapid weight gain.

Body structure also needs to be considered when discussing obesity. The three types of body structures in humans are endomorphy, ectomorphy and mesomorphy. Endomorphy describes an individual having a large body with short arms and legs and having a tendency to be soft and round with substantial fat deposits; ectomorphy indicates a small body with long arms and legs and having a tendency to be thin and bony; mesomorphy refers to an individual that is aesthetically proportioned and having a tendency to be heavily muscled. Obesity definitions vary with body structure and gender, since women generally need more body fat than men. There is an implication that there is some relationship between body frame and the likelihood of having excess adipose tissue. Ectomorphs are said never to become fat and mesomorphs do not show fluctuation of food intake with changes in physical activity.⁴ Therefore it may be true that a link between body type and energy consumption does exist. The body type questionnaire which is included in this unit will help adolescents determine their body type.⁴

During conception, a fetus receives many pairs of genes, one half of each pair derived from the mother and one half from the father. Research shows that several genes have been associated with obesity and that some genes do play an important role in body size and body weight. In studies completed in the early 1900's, physicians noted that obese patients had at least one obese parent, if not two. A child with two obese parents has a 70-80 % chance of becoming obese and a child with one obese parent has a 40-50 % chance.³ There is much controversy surrounding the "Nature versus Nurture" aspects of obesity. Genetics does influence obesity however environment is also considered a major contributing factor. It seems likely that there is a complex interaction between genetics and environment rather than one or the other being the sole determinant.

To determine obesity in adolescents a skin fold or fat fold measurement test is generally used. Using a skin caliper one measures specific, selected sites of the body (triceps, hips and calf). In 1965 Seltzer and Mayer cited the triceps skin fold as the easiest to measure and the most representative of total body fat. Height/Weight charts were not considered a reliable measure of obesity in adolescents since growth spurts

differ. In 1980 Mayer concluded that if an individual looks fat when undressed, he or she is probably too fat.⁵ Some other measures of obesity have included the mirror test, the pinch test, the ruler test and the belt line test.

The incidence of obesity among American teenagers is 12%-15%. Obesity is more common in girls. One study reported a high prevalence of obesity in 14 year old girls (32.4%) compared to 14 year old boys (3.6%). Obesity in these cases was defined by the triceps skin folds being greater than 25 mm. The Ten State Nutrition Survey (TSNS) conducted in 1968-70, found that females were fatter than males at all ages. Adolescence was a period of increasing fatness in the females and of a transient decrease of fatness in males. There is also a higher rate of obesity amongst adolescents from a low socio-economic class as opposed to a higher one.⁵

The second section of this unit will encompass the psychological, social and health factors involved in obesity.

In America, obesity is considered ugly, shameful and disgraceful. One is usually viewed as self-indulgent and lacking self-discipline and control. Some obese adolescents exhibit a disturbed body image which encompasses the inner mental picture of one's body, including emotional feelings and attitudes. Disturbances in body image are primarily in the area of feelings. Factors influencing a disturbed body image are age of onset of the obesity, presence of an emotional disturbance and negative evaluation of the obesity by important others. Adolescence is the period during which a disturbed body image was most likely to begin. This negative image is characterized by a feeling that one's body is grotesque and loathsome and that others view it with hostility and contempt.⁶ The feelings are associated with self-consciousness and with impaired social functioning. Disturbances in body image have a negative effect on daily activities and on relationships with the opposite sex. Weight reduction does not seem to alleviate the problem. Obese adolescents have feelings of low self-esteem, social isolation, feelings of rejection and depression and a strong sense of failure. Social attitudes towards obesity are negative and usually result in the adolescent becoming withdrawn and isolated. In studies conducted it was also found that obese adolescents generally were taller, had advanced bone age and had entered puberty earlier than non obese adolescents.

Suzie always knew she was fat, however, her weight wasn't always a problem. When her pre-school dance teacher assigned her to the second row in the chorus and gave her the lead in "The Teddy Bear's Picnic," she was content in the belief that there is "a place in the sun" for everyone. In grade school, she enjoyed being the first in her class to fit into grown-up clothes. In junior high, when her bust quickly filled to glorious dimensions, she felt mature and female. In those years, being fat was not a disability.

At fifteen, Suzie's world fell apart. Overnight, it seemed, she had become everything nobody wanted to be. The phone stopped ringing, her friends paired off without her and she began to feel like an outcast.²

This story is one example of the world of a fat teenager. The prejudice associated with obesity is intense. Fat people are often disregarded and subjected to ridicule. Most comments about fatness have negative consequences. Young people are constantly humiliated and frequently suffer permanent emotional scars. Fat people become tired of being judged by weight first and personality second.

There are many factors which influence adolescent food behavior and dietary practices. Food behavior is a response to stimuli. Mechanisms that form the foundation of the eating process are located in the hypothalamus of the brain, where the centers for hunger and satiety are located. Obesity was thought to be a misinterpretation of eating cues, external or internal. External stimuli include the appearance, smell, and taste

of food. With internal stimuli, sensations perceived as hunger or satiation exist. These cues play an important part in eating behavior but don't necessarily cause obesity.

Two types of eating behavior are restrained eaters and unrestrained eaters. Restrained eaters limit their food intake below complete satiation or feeling of fullness. Unrestrained eaters eat to the point of complete satiation. Young children are usually unrestrained eaters and by adolescence they are forced to control what they eat however fear and boredom often stimulate eating in adolescents. If this eating is not controlled, it can become uncontrollable and fat begins to accumulate.

Obese teenagers often have disturbed patterns of eating. Some of the common ones are listed below:

- ¥ consumption of an imbalance of high-energy and low nutrient foods over low-energy and high nutrient foods, i.e., eating a donut rather than a piece of fruit
- ¥ interpretation of diverse feelings of situations as reasons to eat
- ¥ susceptibility to eating cues unrelated to physiological needs
- ¥ guilt related to eating under any circumstances
- ¥ lack of understanding of bodily needs for nourishment
- ¥ unwillingness to eat with others, including family members
- ¥ lack of structure in eating patterns
- ¥ lack of sociability connected with eating patterns
- ¥ night eating
- ¥ binge eating
- ¥ eating only in the latter part of the day after starvation in the early part
- ¥ nausea described as connected with eating in the early part of the day
- ¥ lack of any feeling of control over their food intake
- ¥ eating rapidly and indiscriminately¹

Family has the most influence on food behavior. This influence can be either positive or negative. In a dysfunctional family, which we often see in our student population, the influence is a negative one. Little time is spent on meal preparation and the typical "family dinner" is almost non-existent. Most adolescents with poor diets usually eat alone or with friends rather than with family. Nutritionally balanced meals are not common. Food preparation tends to be easy, microwavable and chemically loaded. Eating habits are established in the early stages of life. Overfeeding in infancy can increase the number of fat cells in a baby to as many as 100 billion (children with normal weights have between 25 30 billion fat cells.)⁷ While it is important to ensure that children have an adequate intake of energy, it is also important to limit fat and increase fiber intake in their diets. Although caloric intake is not directly related to obesity it is necessary to limit an excessive energy intake. This needs to begin during infancy and in the early childhood years. Some parents tend to use food as the cure-all for all problems and thus the risk of overfeeding and overeating becomes greater.

The media is a powerful influence on adolescent eating behaviors. Adolescents watch approximately three and one half hours of television daily.¹ A sedentary life-style begins to emerge with hours spent on watching television rather than on physical activities. Adolescents consume large quantities of junk food while enjoying TV and commercials tend to stimulate snacking. Overweight adolescents tend to eat more in response to

these commercials. Commercials use slim, attractive people who eat high-calorie foods and still look great. These messages condone and encourage eating these foods. Television characters eat, drink and talk about food on an average of nine times an hour. Adolescents are prone to weight connected lethargy as described by Dr. Jean Mayer. This is a vicious cycle in which overweight adolescents expect rejection by their peers. They want to do less outdoors and end up spending more time indoors, usually watching television and being exposed to food.⁷

Another influence on eating behavior is peer pressure. Adolescence is a time for socializing, and it is not uncommon for teens to spend time together eating. Fast-food restaurants are a common “hang-out” place for teens. The meals associated with these “hang-outs” are high in calories, fat and sodium. The typical fast-food meal, burger, fries, soda and pizza contain approximately 900-1300 calorie. In studies conducted on a group of twelve to eighteen year olds it was noted that the majority included milk, ice-cream, steak, roast beef, hamburgers, pork chops, ham, chicken, turkey, orange juice, french fries, bread, cake and pie as an integral part of their diet. These foods were favored over foods containing high sources of vitamin A such as liver, squash and spinach which are considered to be distasteful among those teenagers studied.⁸

Besides the psychological and social problems associated with obesity it is important to mention the medical ramifications. Some long-term medical conditions include cardiovascular disease, strokes, diabetes, kidney disease, gallbladder disease, cancer and cirrhosis of the liver. High blood pressure, elevated levels of cholesterol and increased levels of fats in the blood can cause health complications. In addition, the overweight teenager is at risk for developing respiratory disease and orthopedic problems. Fat tends to accumulate in the thighs so many obese teens have difficulty walking because their thighs rub together. Sores and rashes can develop. Because the thighs are so fat the obese tend to separate their legs to walk. In this condition the growth plate, the femoral capital epiphysis, which is at the end of the femur where the leg attaches to the hip, is subjected to an abnormal force which causes it to slide down off the end of the bone. It's the weight of the upper bone that puts the stress on the femoral capital epiphysis. About 25% of obese teens have high results in the diabetic glucose tolerance tests. After weight reduction, these test results return to normal.

The final section of this unit will include the nutritional needs of adolescents, definition of food groups, suggested dietary guidelines and available resources.

Nutritional needs vary from individual to individual but basic nutritional requirements are clearly defined. The caloric requirements for adolescents are determined by biologic age, opposed to chronologic age. The RDA recommends 2700-2800 k calories for males aged 11-18 and 2100 2200 for females aged 11-18. These calories must be a proper mix of proteins, carbohydrates, fats, vitamins and minerals. Caloric needs are related to growth rate, basal metabolic rate and physical activity. Basal metabolic rate is the amount of energy required for the involuntary work of the brain, heart, muscles and digestive organs.

Proteins are comprised of more than 20 amino acids. Complete proteins are usually found in animal foods such as meats, eggs and milk. Incomplete proteins are usually found in vegetable proteins, such as beans and nuts. Protein is needed for adequate cell growth. Too much protein can contribute to obesity.

Carbohydrates include all starches and sugars. The sugars are fructose, found in honey, ripe fruits and vegetables; lactose, found in milk; maltose, found in digested starches and sucrose which is commonly known as table sugar. Starches are found in potatoes, peas, beans, nuts and cereal grains. Carbohydrates supply energy to the body.

Fats serve as an insulator in the body. Fats provide a good way to store energy, and are classified as saturated and unsaturated, the difference being that unsaturated fats are liquid at room temperature. Saturated fats, contained in animal foods, contribute to high cholesterol levels.

Vitamins are needed for energy release and tissue building. Vitamins have specific functions. There is an increased need for vitamins during adolescence. Important vitamins include A, C, D, E, K, Thiamin, Riboflavin, Niacin B1, Folic Acid, B6, Vitamin B12 and Biotin. A well balanced diet usually supplies all necessary vitamins. Vitamin A, found in green and yellow leafy vegetables; folacin, found in dark green leafy vegetables and citrus fruits; and B6 which is found in whole grain cereals, seeds, legumes and potatoes, are found to be insufficient in most adolescents.⁹

Minerals are necessary for muscle contraction, heartbeat control, bone and teeth formation and cell maintenance. Macrominerals are required in substantial amounts and microminerals, or trace minerals, necessary for good health, are needed in small amounts. The examples of macrominerals and their sources are:

calcium—milk and dairy products

phosphorus—milk, peas, beef, pork, tuna and peanuts

magnesium—seafood, nuts, meats, wheat bran

potassium—oranges, tomatoes, bananas

The examples of microminerals and their sources are:

iron—seafood, iodized salt, eggs, green vegetables, dry beans and nuts.

copper—shellfish, organ meats, raisins

zinc—seafood, nuts, meat, eggs

chromium—meats and whole grains

manganese—nuts, legumes, whole grains

selenium—grains and onions

The iron and calcium requirements are increased during adolescence due to the increase in growth rate.⁹

Caloric restriction, physical exercise, behavior modification and hormonal treatments are some of the most common strategies for treating obesity. Fad diets and quick weight loss programs frequently attract the adolescent population. Here again we see the power of advertising:

“I lost 16 pounds in 1 week.”

“Lose 4-6 inches of bulging fat”

“Now you can lose weight without working at it. . . Thanks to ‘Weight Away!’”

“23 pounds gone in just 2 weeks—without pills—drugs—or brutal exercise”

“Lose weight with Ayds”

Without adequate education these weight loss promotions become an attractive solution to obesity. Also included in these traps are over-the-counter diet aids, available in various forms: appetite suppressant candies and pills, local anesthetics, bulking agents and diuretics.

To maintain a healthy body, adolescents need to eat a variety of foods. Educators must stress the importance of watching the intake of fats and cholesterol, eating fiber filled foods, watching sugar and salt intake and eating adequate starches. It is important to emphasize eating breakfast, a meal often overlooked by adolescents. Breakfast is important because it provides a portion of the nutrient intake for the day. Teenagers and young adults should include the following to ensure a balanced diet:

Recommended number of servings

Serving size

MILK GROUP—4 Servings daily

1 cup milk

1 cup yogurt

1 oz. cheese

1/2 cup cottage cheese

1/2 cup ice cream or frozen yogurt

MEAT GROUP—2 Servings daily

2-3 oz. cooked lean meat, poultry, fish

1 egg

1 oz. shellfish

2 tbsp. peanut butter

1/4 cup nuts

FRUIT/VEGETABLE GROUP—4 Servings daily

1/2 cup juice

1/2 cup fruit, vegetable

1 med. banana, apple, orange

1/4 cup dried fruit

1/2 grapefruit

GRAIN GROUP—4 Servings daily

1 slice bread

hamburger bun

1 oz. cold cereal

1/2 English muffin

1/2 cup pasta, rice

1/2 cup cooked cereal

1 roll, muffin, tortilla

The best treatment for obesity in adolescents is one which provides realistic goals. When setting these goals, it is important to consider many factors, including age, motivation, emotional stability, hereditary body build, extent of overweight or obesity, attitudes towards food, home life and physiologic state. A realistic goal for weight loss is slow, averaging 1 to 2 lbs. per week. The importance of a balanced diet must be emphasized. There needs to be a proper mix from all food groups. It is important to eat at least three meals a day, choose foods that have fewer calories, eat smaller portions, cut the intake of fats, alcohol, sugars and limit starches. Fat intake should be 30% (or less) of the total daily calories, carbohydrates 58% and proteins 12%. Calorie levels for obese adolescents should be approximately 1500—1800 k calories. Suggested food substitutions should be provided.

A structured physical activity program must be combined with dieting. Exercise is crucial both in weight reduction and maintenance. Besides providing a positive emotional outlet and a general sense of well being, exercise is a way to have a more attractive, toned body. Walking up the stairs instead of using an elevator, walking rather than driving or taking the bus are some routine activities that can increase physical activity by changing regular patterns. Obese teenagers generally do not like gym classes in school. Motivational techniques must be utilized by educators and parents to promote student participation in such physical activities. Combined support is missing in inner-city districts. Swimming is considered to be an ideal first exercise for overweight children. Playing ball (softball, kickball) is also a good activity. Gymnastics provide an opportunity to develop flexibility and strength. Exercise promotes the development of socialization skills, provides time away from food, decreases appetite, increases absorption of calories and improves physical and mental health. Consistency and continuity in diet and exercise must be stressed.

To achieve weight loss adolescents must want to lose weight and must have adequate support. Diet and exercise should promote a change in behavior, attitudes and life-style, through behavior modification programs. These programs encourage changing the pace, times and location of consumption of food. Some recommended suggestions for modifying eating behavior are: to eat all meals at the table, do not read or watch TV while eating, take only the amount you intend to eat to the table, do not feel you must finish everything on your plate if you feel you've had enough, do not take second portions, measure portions, drink a glass of water before each meal, eat three meals a day and reward yourself realistically. Alternative techniques for combatting stress, boredom and fatigue, rather than eating food are encouraged while maintaining a food diary. This diary should include information about time spent eating, hunger rating, mood,

circumstances, food consumed and quantity. Through constant monitoring of the food diary, eating behavior can be changed.

With adolescents a multidisciplinary approach must be used when dealing with obesity. The nurturing and care levels associated with childhood must be continued throughout adolescence.

BODY TYPE QUESTIONNAIRE

Score one point for every characteristic which is often true of you. You may check more than one item in some rows this means you have the attributes of two or more body types.

Endomorphy

Relaxed posture and movement ()

Love of physical comfort ()

Love of eating ()

Love of social activities ()

Love of approval and affection ()

Need for people when troubled ()

Relaxed, friendly with alcohol ()

Soft, rounded physique ()

TOTAL ENDOMORPHY ()

Mesomorphy

Assertive posture and movement ()

Love of physical adventure ()

Love of activity ()

Pleasure in competition ()

Delight in gaining authority ()

Need for action when troubled ()

Noisy, aggressive when drinking ()

Thick, muscular underlayer ()

TOTAL MESOMORPHY ()

Ectomorphy

Restrained posture and movement ()

Secretive emotions, self-consciousness ()

Love of quiet ()

Resistance to habit and routine ()

Slow physical maturation ()

Need for solitude when troubled ()

Distaste, avoidance of alcohol ()

Slender, bony frame ()

TOTAL ECTOMORPHY ()

GLOSSARY

Adipocyte - A special cell that contains fat.

Adolescence - The time period between puberty and adulthood, roughly from about ages 12 to 21.

Appetite - Sensations which cause a desire for hunger.

Basal Metabolic Rate - Amount of energy required for the involuntary work of the brain, heart, muscles and digestive organs.

Biologic Age - Age in terms of growth spurt and pubertal status.

Body image - The inner, mental picture of one's body.

Ectomorphy - Human body structure which tends to be thin and bony.

Endomorphy - Human body structure which tends to be soft and round.

Hunger - Unpleasant sensations felt when one is craving food or after food deprivation.

Mesomorphy - Human body structure which tends to be muscular.

Obesity - Excessive accumulation of body fat.

Overweight - Weight in excess of normal range.

RDA - Recommended Dietary Allowances.

Satiety - Sensations which drive one to stop eating because hunger has been satisfied.

Self-Esteem - An opinion of oneself, often taken as the positive feelings one holds about oneself.

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LESSON I YOU ARE WHAT YOU EAT

Objective Given a list of food exchanges, students will plan an individualized weekly menu which consists of a balance of the daily recommended food allowances.

Materials Lists of food exchanges, student worksheets

Procedure

1. Discuss the importance of eating a balanced meal.

2. Review food groups and pass out food exchange lists. Specify the minimum recommended numbers of each food group up per day.
3. Instruct students to design a daily and weekly menu for themselves, selecting their favorite foods from each of the basic food groups.
4. Distribute copies of the food diary.

Discussion

1. Why is it important to eat foods from all of the different food groups?
2. What did you observe about your eating habits?
3. What changes, if any, did you make in your daily eating habits?
4. If you wanted to lose weight, which foods would you add or delete from your list?
5. Did you follow your personalized menu daily?

Weekly Menu

Day Breakfast Lunch Dinner Snack

Sunday

Monday

Tuesday

Wednesday

Thursday

Friday

Saturday

(table available in print form)

FOOD EXCHANGE LIST

MILK GROUP Choose any four of these servings per day:

MILK

canned 1/2 cup ice-cream 1/2 cup
 dry 1 cup yogurt 1 cup
 lowfat 1 cup cottage cheese 1/2cup
 nonfat 1 cup cheese 1 oz.
 skim 1 cup

MEAT GROUP - Choose any two of these servings per day:

fish, broiled 3 oz.	eggs, boiled or poached 1
chicken, baked or broiled, skin removed 3 oz.	
beans, baked 1/2 cup	ham, fat trimmed 3 oz .
hamburger, lean broiled 2 oz.	
hot dog 1	steak, fat trimmed 2 oz .
tuna, water packed 4 oz.	turkey, white meat 3 oz .

FRUIT VEGETABLE GROUP Choose any four of these servings per day:

apple 1 small	orange 1 small
apple juice 1/3 cup	orange juice 1/3 cup
apricots 2 med.	peach 1 med.
banana 1/2 small	pear 1 small
cantaloupe 1/4 small	pineapple 1/2 cup
cherries 10 large	pineapple juice 1/2 cup
grapefruit 1/2	plum 2 med.
grapefruit juice 1/2 c.	raisins 2 Tbs.
grapes 12	strawberries 3/4 cup
grape juice 1/4 cup	tangerine 1 med.
nectarine 1 small	watermelon 1 cup

Vegetable serving size is 1 cup raw or 1/2 cup cooked

asparagus	green pepper
bean sprouts	lettuce
broccoli	mushrooms
brussel sprouts	onion
cabbage	radishes
cauliflower	squash
celery	string beans
cucumber	tomatoes
eggplant	zucchini

BREAD GROUP Choose any four of these servings per day:

bread 1 slice	crackers, saltines 5
bagel 1/2	flour 2 1/2 Tbs.
dinner roll 1	popcorn, unbuttered 1 cup
English muffin 1/2	rice or grits, cooked 1/2 c.
hamburger roll 1/2	spaghetti/noodles 1/2 cup
hotdog roll 1/2	corn 1/3 cup
pita bread 1/2	corn on the cob 1/2 med.
tortillas 1	peas 1/2 cup

cereal, cooked 1/2 cup potatoes, sweet 1/4 cup
cereal, dry 3/4 cup potatoes, baked/boiled 1
crackers, graham 2 potatoes, white, mashed 1/2 c
FAT GROUP Choose any three of these per day:

butter 1 tsp. almonds 7
sour cream 2 Tbs. peanuts 20
cream cheese 1 Tbs. pecans 3
margarine 1 tsp. walnuts 3
shortening 1 tsp. oil 1 tsp.
mayonnaise 2 tsp. salad dressing 1 Tbs.

LESSON II BY GOLLY BY GUM

Objective *Students will determine the amount of sugar contained in bubble gum.*

Materials *6 different brands of bubble gum, including one brand of sugarless bubble gum*
scales and weights

6 small cups

pens or pencils

Procedure

1. Divide class into six teams.
2. Distribute one pack of gum to each group.
3. Each group will weigh their pack of gum without wrappers in a small cup.
4. Teacher will instruct each group to chew their pack of gum for 5-10 minutes.
5. Each group will weigh their gum again in the same small cup.
6. Pass out student worksheet and instruct students to record data on the worksheet and to compute the amount per pack.
7. Let some of the pieces of chewed gum sit overnight to see if the water was absorbed.

Weigh and record the weight again.

Discussion

1. Which brand of gum contains the most amount of sugar?
2. Is sugar good for you?
3. What are the different kinds of sugars?

4. Are any of those sugars good for you? Which ones and why?
5. Why is it important to limit your sugar intake?

By Golly Gum

(table available in print form)

LESSON III WHERE'S THE FAT?

Objective Students will determine and develop an awareness about fat calories and the percent of calories from fat in different fast food entrees.

Materials List of fast food selections (nutritional pamphlets are available from each fast food establishment)

student worksheet

pencils or pens

Procedure

1. Conduct a class survey of favorite fast food entrees.
2. Discuss the convenience of fast foods and their nutritional value.
3. Distribute copies of fast food entrees.
4. Distribute worksheet and instruct students to complete the worksheet.

Discussion

1. Which entree has the highest percentage of fat? The lowest percentage?
2. What makes fast-food entrees high in fat?
3. Which food has the highest caloric value? The lowest caloric value?
4. How could you limit your intake of fat calories in a fast food entree?
5. Why is it important for fast food chains to do something to reduce the fat content of their food?

Where's the Fat?

FAST FOOD FACTS

NAME _____

WHAT PERCENT OF THE TOTAL CALORIES OF EACH FAST FOOD ENTREE LISTED BELOW COMES FROM FAT? (1 gram of fat = 9 calories)

FOOD	Grams of Fat	x 9	Number of Fat Calories	Total No. of Calories	x 100 =	% of Calories from Fat
1. Burger King Whopper	36	x 9 =		614	x 100 =	%
2. Burger King Whopper with cheese	44	x 9	= _____	706	x 100 =	_____ %
3. Wendy's Big Classic	33	x 9	= _____	570	x 100 =	_____ %
4. McDonalds Big Mac	32	x 9	= _____	560	x 100 =	_____ %
5. Burger King plain cheeseburger	15	x 9	= _____	318	x 100 =	_____ %
6. McDonalds plain hamburger	9	x 9	= _____	255	x 100 =	_____ %
7. Wendy's Grilled Chicken Sandwich with sauce	13	x 9	= _____	340	x 100 =	_____ %
without sauce	7	x 9	= _____	269	x 100 =	_____ %
8. McDonald~ Hot fudge sundae	3	x 9	= _____	240	x 100 =	_____ %
9. McDonalds Vanilla shake	1	x 9	= _____	290	x 100 =	_____ %
10. McDonalds 6 piece Chicken McNuggets	15	x 9	= _____	270	x 100 =	_____ %

WHICH FOODS CONTAIN 50% OR MORE OF THEIR CALORIES FROM FAT?

FAST FOOD ENTREES CALORIES/GRAMS OF FAT

CALORIES	GRAMS OF FAT
McDonalds hamburger	255 9
Mcdonalds cheeseburger	320 13
Mclean burger	320 10
Chicken McNuggets	270 15
Barbecue sauce	50 .5
Filet of fish	370 18
Garden salad	50 2
Ranch dressing	220 5
Egg McMuffin	280 11
Big Mac	560 32
Vanilla shake	290 1
Chocolate shake	320 2
Hot fudge sundae	240 3
Burger King broiler with sauce	379 18
without sauce	289 8
Whopper	614 36
Whopper with cheese	706 44
Burger King cheeseburger	318 15
Wendy's big classic	570 33
Wendy's hamburger	180 12

Grilled chicken/sauce	340 13
Grilled chicken/plain	269 7
French fries	440 23
Baked potato/cheese	470 21
Chili	220 7

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