The effects of sugar on the body: A teaching unit for the secondary level

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THE EFFECTS OF SUGAR ON THE BODY
A TEACHING UNIT
FOR THE SECONDARY LEVEL
A Project Proposal Submitted to
The Faculty of the School of Education
In Partial Fulfilment of the Requirements of the Degree of
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By
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STATEMENT OF NEED

Within the scope of the total nutrition program in home economics, I would like to concentrate on the present use and abuse of sugar in the American diet. The consumption of sugar has gone from eight pounds per capita in 1820\(^1\) to one-hundred and thirty pounds per capita in 1983. American people have not increased their total consumption of food, but they have increased their consumption of sugar. This indicates a shift from nutritious foods to those of less nutritional value.

Good nutrition is vital to the achievement of one's genetic potential. Nutrition education relates scientific knowledge to the total strategy of survival.

There are tremendous forces at work in our society that lead many people away from nutritious food. Millions of dollars are spent each year on advertising food, and unfortunately some of the highly advertised foods are low in nutrition. The food processors' concern is for profit, not necessarily for the health of the consumer. Food processors find that sugar and sweetness help sell their products.

People are eating many of their meals away from home, often in fast food restaurants which offer very little opportunity for a nutritious selection of food. It is important to teach food and nutrition education to students in school so they will be able to make intelligent decisions about food choices. These decisions are essential for the maintenance of health and well being. These choices can affect the health,
quality of life and length of life by avoiding many of the nutritionally related diseases such as heart disease, cancer of the colon, tooth decay, diabetes, accelerated aging and even behavior problems. These and other consequences will be discussed later in this paper.
REVIEW OF LITERATURE

SUGAR--INTRODUCTION

This nation's mammoth food industry plays a major role in influencing food habits. Manufacturers cater to -- some would say "take advantage of" -- the public's desire for a particular taste or for convenience. After all, there is a lot at stake. The American appetite is worth two hundred billion dollars a year.²

The problem with sugar is not the substance itself, throughout history man has safely consumed the natural sugars present in fruits and vegetables. The menace of sugar arises when we get it from other than natural sources. Refined sugar, because of its highly concentrated form and complete lack of essential proteins, vitamins, minerals, and fibers, is now regarded nutritionally as a diluting agent of the modern diet. It is a displacer of other factors far more essential than sugar. Thus, the more sugar consumed, the less opportunity for getting essential nutrients into the diet. When sugar is furnished as a replacement for the nutrients essential for life, then serious physiological consequences follow, such as heart disease, cancer of the colon, tooth decay, diabetes, accelerated aging, obesity, and evidence is being gathered to show that sugar can create behavior problems in certain groups of people. This is the essence and crux of the problem with which we have to deal.
PATTERNS OF SUGAR CONSUMPTION

Nutrition researcher, Dr. John Yudkin, in his book, *Sweet and Dangerous*, writes that "people have become increasingly unable to separate needs and wants, to an extent that the satisfaction of wants without hinderance can be disastrous for the individual and for the human species. Man always wanted sweets because he liked them. So long as the only sweet foods he could find were fruits, by satisfying his wants for sweetness, he helped to satisfy his needs for Vitamin C and other nutrients, but since he began to produce his own foods; and especially since he developed the technology of sugar refining and food manufacture, he has been able to produce and separate sweetness from all other nutrients."\(^3\)

We are becoming increasingly aware of the role of sugar in causing overweight and dental carries as well as heart disease, chronic indigestion, ulcers, diabetes, cancer of the colon as well as behavioral problems. After ten years of research, Dr. Yudkin makes this startling statement: "If only a small fraction of what is already known about the effects of sugar were to be revealed in relation to any other material used as a food additive, that material would promptly be banned." (Yudkin, p. 47)

One of the most startling rediscoveries of modern medical science is that addiction to sugar parallels in many ways addiction to alcohol or other addictive drugs, and its long
term impact on health may be even more destructive. Ninety percent of alcoholics are hypoglycemic.\(^4\)

Sugar found naturally in foods is not a matter of great concern. Sucrose, or table sugar, refined from either cane sugar or sugar beets is the primary target for controversy. It might be helpful to discuss several of the different types of sugars, and the ways confusion is encouraged by misunderstanding the difference between them.

Glucose is a key material in the metabolism of all plants and animals. Many of our principle foods are converted into glucose in our bodies, and it is frequently termed "blood sugar." Glucose is an essential element in the human bloodstream. When sugar promoters tell us that sugar is an essential component of human metabolism, they are referring to glucose. But the product they are selling is sucrose, which affects the body in a profoundly different way. When the word "sugar" can refer to glucose in the bloodstream and the sucrose in Coca-Cola, it is obvious that a slight fuzzing of information by sugar manufacturers can lead to distorted understanding by the general public.

Another form of sugar is fructose which is found naturally in fruits, honey and molasses. Maltose is found in malt and corn syrup. Lactose is a sugar found in milk.\(^5\)

These sugars pose no health problems because they combine naturally with sufficient quantity of other nutrients. However; substituting honey, dextrose, and molasses for table sugar is
not an answer to the sugar problem, as some health enthusiasts would have us believe. For example: honey has sixty-four calories, compared to forty-six for a tablespoon of white granulated sugar. The mineral content of honey is negligible. Honey contains only a minimal amount of calcium, phosphorus, and iron. A predigested product of bees, it contains only trace amounts of thiamine, riboflavin, and niacin (some of the B vitamins), and a trace of Vitamin C. The amount of nutrients compared to the quantity of calories is so slight as to make them insignificant. (Schwantes, p. 15) In other words, the nutrient density of honey is very low. Nutrient density is simply the relationship of calories to nutrients. Nutritious foods have a low calorie content and high nutrient content and are said to have a high nutrient density. Honey and molasses do not fall into this category. Dextrose has no vitamins or minerals. Like sucrose, it is high in calories.

In the film entitled, *Eat, Drink & Be Wary*, renowned nutritionist Jean Mayer points out that since 1955 our food supply has been changing rapidly. We are moving from an agricultural food supply, when foods were bought or grown by the homemaker and prepared much in the natural state, to a highly processed food supply which brings much of the hidden sugars that are now making up much of our diets. Just about everything we purchase in cans, bottles, or boxes contain sugar, and often as a major ingredient.
Clear labeling and careful label reading by the consumer is the only way that will clarify the amount of sugar we ingest in processed foods. Sugar is added not only in sweet baked goods, desserts, and soft drinks, but also in sauces, many baby foods, most fruit drinks, salad dressings, canned and dehydrated soups, pot pies, frozen vegetables, most canned and frozen fruits, fruit yogurt, and breakfast cereals. If you eat a hot dog, there is sugar in the meat, catsup, mustard, relish, and even in the bun. A list of ingredients on the catsup bottle might read, "tomatoes, sugar, dextrose, vinegar, salt, onions, and spices." To confuse matters, two major elements here are refined sugars - "sugar and dextrose," with the latter hidden behind an unfamiliar name.8

Among processed foods that are appearing more and more frequently in our diets is the extraordinary increase in the soft drink consumption. Soft drinks were originated by Eugene Roussel in 1839 in Philadelphia.9 Before this time soft drinks were unknown. By 1976, one fourth of our total sucrose consumption came through soft drinks, and this time does not include sugar filled fruit drinks which may provide up to another ten percent of our sucrose consumption. There are more soft drinks consumed in the United States than milk and fruit juice combined. (Brewster, p. 45) By cutting down on the consumption of soft drinks, we would take in less caffeine and non-nutritive additives, colors, flavors, and preservatives.
Foods furnish two basic kinds of carbohydrates: sugars, or simple carbohydrates, and starch and complex carbohydrates. Along with the increase in the consumption of sugar is the decrease in the consumption of complex carbohydrates. As we have eaten fewer grains and cereals and more sweeteners, we have consumed fewer starches. (Brewster, p. 45) The emphasis on sugars instead of complex carbohydrates is unfortunate. Sources of starch -- foods like breads, cereals, whole grains, and potatoes are important sources of vitamins, minerals and proteins, while sugars contain no nutrients -- only calories. Thus, junk foods and candy are referred to as foods containing "empty calories," calories that contain no nutritional value. More importantly, whole grains and whole grain breads and cereals are good sources of dietary fiber. This is the part of the complex carbohydrates such as cellulose and lignin that are not digested by the body and are referred to as fiber. Dietary fiber is essential to proper digestive function and may even reduce the risk of colon cancer. (Brewster, p. 63) The nutritional quality of our diet has suffered with the switch from starch toward sugar. In 1977 the Senate Select Committee on Nutrition and Human Needs was created in Congress. That committee has recommended that Americans reduce their consumption of refined sugars from the current eighteen percent to total calories, to ten percent. Intake of complex carbohydrates and "naturally occurring sugars" should increase from twenty-eight percent of calories that they now supply, to a total of
A further discussion of the committee's recommendations appears in the "Recommendations" section of this paper.

Advertising has played an important role in this shift from natural, nutritious foods to the less nutritious foods that we find Americans consuming. As a rule of thumb, the more highly advertised a food, the less nutritious it is.

One of the areas of advertising which has come under attack most often is television advertising aimed at children. In 1977, the graduating class of Minnesota School of Public Health monitored five-hundred and eighty television ads over a twenty-four hour period. The results of their survey showed that forty-five percent were for cereals, and the sugar coated cereals outnumbered the non-sugar coated cereals by five to one. Nutritionist Jean Mayer in his book, Overweight: Causes, Costs, and Control, suggests that sugar coated cereals be put on the shelves in the grocery store with candy where they belong, for they have much more in common with candy than with cereal. He adds that one ounce of sugar coated cereal averages one-half ounce of sugar. If people would omit presweetened cereals from their diet, they could cut their sugar consumption by one-eighth!

If adults are encouraged by television commercials to destroy their health by eating sugar laden products, it is unfortunate. But it is totally irresponsible to teach children to prefer food products that will be detrimental to their
health. (Peavy, p. 140) The 1977 Senate Report on Dietary Goals for the United States noted, "Persuasive commercial forces work unremittingly to encourage unwise eating habits and to nullify sound nutrition education." (Dietary Goals, p. 28)

Action for Children's Television (ACT), a Boston based group, continues to pressure the FCC. The group argues that children should be "protected from deception in the marketplace the same way adults are...Nobody ever told a child that a Milky Way bar causes cavities; the message is 'Milky Way, at work, rest, or play.' ACT would like to see commercials for sweets completely removed from children's television.13

Practices parents use also contribute to their children's view of sweets. Dr. Jerry Wiener, chairman of the Psychiatric Department at Washington, D.C.'s Childrens' Hospital, says that the way children respond to sweets is conditioned by the way those foods have been used. When dessert is used as a reward for eating other foods, the parent is showing an assumption that the child does not want other foods.14

Foods should never be used as a reward or as punishment. Using food as a reward can contribute to obesity. When food is given as a pacifier, it is a bribe which the parent gives the child instead of giving their time. If the child is upset, reassurance and comfort are needed, not sweets.
THE EFFECTS OF SUGAR ON HEALTH

How the Body Uses Sugar

To understand the effects of sugar on the body compared to foods with high-nutrient value, it is necessary to know a few basic facts about how the body uses food. The nerves, the brain, and every cell in the body needs a constant supply of energy. The energy is supplied to them in the form of blood sugar, or glucose. When the blood's supply of sugar is low, there are two ways it can be raised. The body converts energy that has been stored in the body as either glycogen or fat into blood sugar, or it converts newly digested food into blood sugar.

When you supply your body with energy by eating refined carbohydrate foods (especially at breakfast), your blood sugar rises quickly but then dissipates almost as quickly. This is because refined carbohydrates are rapidly digested, producing a temporary oversupply of sugar in the blood. This situation stimulates the pancreas and liver to withdraw the excess sugar in order to keep the blood's sugar at a desirable level. The excess energy is then converted into starch in the liver and is stored in the cells as glycogen, then is eventually converted into fat.

After the withdrawal of excess energy, the blood sugar level drops and a person experiences hunger, fatigue and a craving for more energy food. If no food is eaten, the blood
sugar will remain at an undesirably low level until glycogen stored in the body is reconverted to blood sugar. Because he experiences hunger, however; a person will often eat before the glycogen is reconverted into glucose. Excess unused or unconverted glucose is converted into body fat. If more sugar or refined carbohydrates are eaten, the whole process is renewed, and more and more fat is stored in the body. Obesity is one result. 

Overweight

Medically speaking, being 'overweight' generally refers to those who weigh ten to twenty percent over their designated weight. To gain entrance to the obesity club, one generally has to be thirty percent or more over desirable weight. Obesity is very common in the United States and is becoming an ever increasing and serious health problem. It has been estimated that in Western countries, up to one third of the adult population exhibits various degrees of obesity. In fact, excessive weight has been declared the most common nutritional disorder in our society. Obesity is a symptom rather than a disease such as high blood pressure or anemia. It results when a person ingests more calories than are consumed by energy. The number of overweight children in the United States has increased rapidly in the last twenty years. (Mayer, p. 5) In a study of high school students in Berkeley, California, R.L. Huenemann found that eleven percent of the ninth graders and fourteen percent of the twelfth graders were considered to be obese.
During the last decade it has become apparent that obesity clearly reduces life expectancy and increases morbidity and mortality from various causes. Closely linked to obesity is the contention that too much sugar can accelerate the life processes and shorten the life span. Dr. John Yudkin, at the University of London, did experiments with animals using a high sugar intake. He found that by keeping them on a high sugar diet, it reduced their life span by thirty-three percent. (Yudkin, p. 117)

Overeating at a very early age is considerably more deleterious than later in life, since it may result in an increased number of fat cells which may be irreversible. This excess number of fat cells form the basis for a kind of obesity that is resistant to weight reduction.

Overeating is not always gluttony, since small daily amounts of additional calories will, over the years, add up to increased body fat. One hundred excess calories each day will result in a weight gain of ten pounds a year.

In addition to the problem of being overweight, sugar has more serious consequences. High and low swings in the blood sugar level are extremely detrimental to the liver, the pancreas, and the entire body. Over a period of years, eating this way is devastating to the human organism, resulting in rapid aging, bodily deterioration and susceptibility to sickness and disease. Unless sugars and refined carbohydrates are combined with other nutrients, they are too rapidly digested.
and converted into blood sugar. This is why naturally occurring sugars, such as those in vegetables and whole grains, are better for you. They are complex carbohydrates containing vitamins and other nutrients bound up on cellulose fiber which takes longer to digest and to enter the bloodstream. The sugar in fruit, though rapidly digested, is also combined with valuable fiber, vitamins and minerals. (Burum, p. 7) Besides, it would take a whole basketful of apples to get the same amount of sugar found in only one large piece of chocolate cake.

HEART DISEASE

Heart disease is the #1 killer in the United States. Obesity, cholesterol level, and tension increase the chances of heart problems. Dr. Yudkin has postulated that triglycerides - a lipid deposited in the arterial walls - not cholesterol, is the culprit leading to coronary disease. Table sugar, or sucrose, is the only carbohydrate that can appreciably elevate the body's triglyceride level. (Yudkin, p. 125)

DIABETES

It has not been proven that sugar is the primary cause of diabetes. It is a disorder of the body's metabolism. Those who claim that sugar causes diabetes base it on the observation that the death rate from diabetes and the consumption of sugar have both risen dramatically in the last century. They further note that in countries where sugar consumption is low, the
death rate from diabetes is correspondingly low. The primary cause is unknown, but there is an inherited predisposition for the disease. A high sugar intake may contribute to the onset of diabetes in the diabetic-prone individual. (Schwantes, p. 36) 

GENERAL PHYSIOLOGICAL EFFECTS

So essential is nutritional balance to our bodies, that we have many ways to provide against sudden shock of a heavy intake of sugar. Minerals such as sodium (from salt), potassium and magnesium (from vegetables), and calcium (from the bones and teeth) are mobilized and used in chemical transmutation; neutral acids are produced which attempt to return the acid-alkaline balance factor of the blood to a more normal state.

Sugar taken every day produces a continuously over-acid condition, and more and more minerals are required from deep in the body in an attempt to rectify the imbalance. Finally, in order to protect the blood, so much calcium is taken from the bones and teeth that decay and general weakening begins.

Excess sugar eventually affects every organ in the body. Initially, it is stored in the liver in the form of glycogen. Since the liver's capacity is limited, a daily intake of refined sugar (above the required amount of natural sugar) soon makes the liver expand like a balloon. When the liver is filled to its maximum capacity, the excess glycogen is returned to the blood in the form of fatty acids and is stored in the most inactive areas of the body - the belly, the buttocks, the breasts, and the thighs. When these comparatively harmless
places are completely filled, fatty acids are then distributed among active organs, such as the heart and kidneys. These begin to slow down, and finally their tissue degenerates and turns to fat. The whole body is affected by their reduced ability, and abnormal blood pressure is created. Our parasympathetic nervous system is affected; and organs governed by it, such as the brain, become inactive or paralyzed. (Normal brain function is rarely thought of as being as biological as digestion.) The circulatory and lymphatic systems are invaded, and the quality of red-corpsules start to change. An overabundance of white blood cells occur, and the creation of new tissue becomes slowed-aging accelerates.

Our body's tolerance and immunizing power become more limited so we cannot respond properly to extreme attacks, whether they can be cold, heat, mosquitos, or microbes. Excessive sugar has a negative effect on the functioning of the brain. The key to orderly brain functioning is glutamic acid, a vital compound found in vegetables. The B vitamins play a major role in dividing glutamic acid into antagonistic-complementary compounds which produce a "proceed" or "control" response in the brain. The B vitamins are also manufactured by symbiotic bacteria which live in our intestines. When refined sugar is taken daily, these bacteria wither or die, and our stock of B vitamins gets very low. Too much sugar makes one sleepy and our ability to calculate and remember is lost. (Dufty, p. 38)
In laboratory experiments, it has been found that animals can live longer on a diet of just water than on a diet of sugar and water. One of the incidents that prompted this kind of nutritional experiment was the incident in which a vessel carrying a cargo of rum and sugar was shipwrecked in 1793. The five surviving sailors were rescued after nine days. They ate nothing but sugar and rum for nine days. They were found to be in an extremely wasted condition due to starvation beyond what would be normally expected. As in much nutritional data on human nutrition, one substance cannot be isolated without regard to others. In this case the rum undoubtedly had as much a role in the sailor's condition as the sugar (rum is made from cane sugar). In the experiments with animals that followed; however, it was shown that sugar is worse than only water. Sugar drains and leeches the body of precious vitamins and minerals through the demand its digestion, detoxification, and elimination make upon one's entire system.21

DENTAL CAVITIES

Probably the most recognized effects of sugar on the body are the effects on the teeth. There are several factors that influence the effect of sugar on the teeth. The first is the form of sugar. Sugary foods that stick to the teeth tend to cause more cavities than those which do not stick. The time of day is a factor. Eating sugary foods between meals and not brushing is worse than eating sweets at meal
time because they are combined with other foods and drinks which help remove sugar from the teeth and slow their absorption into the blood. The most devastating action occurs when sucrose forms the basic plaque network and glucose-fructose hasten its growth. If sugar coated cereal is eaten for breakfast and the teeth are not brushed afterwards, a sucrose based plaque is laid down. If a banana is eaten a few hours later it becomes three to five times more likely to cause cavities with the plaque formation than without. (Peavy, p. 135)

When thinking about dental cavities, remember that there are three factors that lead to this disease: one is the plaque on the teeth rotting them from the outside, the second is the lack of nutrients to nourish and sustain the tooth. The third, which has been mentioned before, is the ability of sugar to leech essential minerals like calcium from the interior of the teeth as well as the bones.²² Sugar plays a much more important role than some would have us believe. Some think that if you brush after meals, sugar will have little effect. They fail to realize that nourishment must come from inside the body to keep the teeth, gums, and bones healthy.

Corporate sugar users are not oblivious to their product's dangers. Robert Choate, an independent food consultant, says that two major cereal companies "have for years been conducting experiments on children in an effort to find ways to buffer the sugar in the products before it does damage to the teeth. They refuse to make this research public." He adds, "I speculate
that it is because they have found no way to maintain highly sugared products and reduce cavities." Choate poses another question, "If sugar is so powerful that it can rot holes in the hardest substance of our bodies -- our teeth -- what is it doing to our soft spots?" (McCarthy, 1973)
Dr. Lendon Smith, a pediatrician from Oregon, cites a relationship between sugar ingestion and other allergies as they concern the normal pH balance of the body as the culprit in behavior changes relating to sugar consumption. It has been demonstrated that when the blood sugar fluctuates from allergies or sugar ingestion, the body tends to go into acidosis. The usual energy source--glucose--is unavailable, so the body burns fat. The end products are acidic; this acidosis can have an adverse effect on the body and the brain. The saliva, intestinal juices, and the urine will become acidic to help maintain the blood at a consistent level (pH 7.4). Water is neutral (pH 7.0). Normal saliva is slightly acidic at 6.8, but a drop of salivary pH of 5.5 to 6.0 may be associated with behavior changes -- out of sorts, hyperactivity, and noncompliance.

A poor diet or bad nutrition can affect a child's behavior. According to Doctors Benjamin and Helen Feingold who developed a special diet to control behavior, diet can affect behavior, attention span, hyperactivity, and school performance. Simple sugars include not only refined sugar cane, but also beet sugar, brown sugar, molasses, and honey.

The Feingolds prescribed a diet that names two groups of foods that should be avoided. Sugar is included in one group. They predict that with the recommended diet, there is a sixty...
to seventy percent chance of controlling behavior in hyperactive children. Implementing a diet is difficult because ninety percent of processed foods contain artificial colors and flavors, with sugar additives. Sugar constitutes approximately eighteen percent of the average American's diet. Also, it may take as little as thirty-six hours or as long as forty days to see a change in a person's behavior following the start of the diet.24

E. Cheraskin, a pioneer in orthomolecular psychiatry, believes that foods are the keys to emotional health.25 Another researcher, E. Switzer, has written that most people have mood swings when they are inadequately fed and that either too little glucose or too much glucose in the blood has definite side effects on many organs of the body including the kidneys, arteries, and certainly the brain. This accounts for mood swings which are often seen as changes in a person's behavior.26

Dr. Lendon Smith claims that children cannot handle extra insulin, which is produced by the body as a result of extra sugar in the bloodstream. This results in a sudden drop in the sugar level in the bloodstream. The resulting sudden drop triggers the adrenal glands to pour out adrenaline whose function is to release sugar from the liver and thus restore the blood sugar level. Smith suggests that the by-product of the increase in adrenaline is frantic, purposeless muscular activity. (Smith, p. 212)
In Cuyahoga Falls, Ohio, Barbara Reed, a child probation officer of the Municipal Court, discovered that young offenders consumed great quantities of sugar, soft drinks, and starch. She recommended sugar-free, low starch, no junk food diets. Those who followed her recommendations were never back in court. One judge was so amazed at the changes in these offenders that he began to order defendants to eat nutritional diets.27

The Department of Nutrition and Dietetics at the University of Montreal conducted a year-long experiment with an amateur hockey team. The team was divided into two groups. One group was free to eat candy and chocolate bars. The second group was to eat sugar-free foods. The sugar eater's play deteriorated as more and more sugar and sugar related products were consumed. This group had weakened metabolism. Its members were physically inferior to those in the sugar-free group. Concentration, resistance to illness, and overall ability decreased even with small amounts of sugar. The sugar-free group's performance improved as the year progressed.

(Phlegar, pp. 53-57)

At the New York Institute for Child Development, the director, Alan C. Levin, says that his office was chaotic the day after Halloween. His patients, who were hyperactive and learning disabled, could not participate in the therapy sessions after they had eaten so much candy. Their attention spans were limited; they were almost unmanageable.

(Phlegar, pp. 53-56)
In Roanoke, Virginia, an attempt was made in 1976 to move Halloween from Saturday night back to Friday night so that students would have two days to get the sugar out of their systems. One council member, who is also a teacher, observed that the candy in the children's bloodstream made them uncontrollable in the classroom. (Phlegar, pp. 53-56)

Many researchers have conducted studies trying to discover whether or not diet does or can effect behavior. In one study, a 13-year old girl was hospitalized by her pediatrician because she had erratic, irrational behavior. The girl was put on a high protein, sugar-free diet plus vitamins and minerals. After a few days her behavior was dramatically changed. She had previously been eating foods high in sugar content. Her parents reported finding candy wrappers hidden away in her room after her behavior explosions.\(^{28}\)

In another report, H.J. Roberts, M.D., cites the results of a study involving 29 patients, 24 children and 5 adults, who had severe reading problems. Twenty-one of the subjects were placed on a strict diet that eliminated table sugar and foods containing simple sugars. All the subjects demonstrated improvement in reading, and twelve of these improved in other school subjects as well.\(^{29}\)

The internationally known nutritionist, Dr. Carlton Fredericks, in his book, Look Younger, Feel Healthier, supports the view that no form of sugar is a good form. We get enough sugar naturally through foods so that the addition of extra
sugar is not necessary. He also supports the view that a law should be passed to forbid the sale of sweet foods and drinks within the schools.30

The above research should persuade educators, parents, and concerned adults to do something about the diet of children especially those with behavior problems. Many children who cannot handle sugar in their bodies for one reason or another end up in the principal's office, in alternative schools, in special education classes, or perhaps in jail. For some of these students, the cause of disruptive behavior is the food they are eating. If we changed their diets, their behavior and scholastic achievement might improve. All students and their parents should be made aware of the importance of foods for physical and mental health. Special attention should be given to students in special education classes, those with behavior problems, and to those students with physical problems. It should be emphasized that it is the student's and parent's responsibilities to do something about changing the diet.
It is generally accepted within the medical and nutritional professions that some of our nation's most prevalent health problems are diet related.

In January, 1977, the Senate Select committee on Nutrition and Human Needs published a study that recapped dietary changes and recommended specific dietary goals. The report noted that six of the ten leading causes of death in the United States are linked to diet (heart attack, stroke, arteriosclerosis, cancer, cirrhosis of the liver, and diabetes). These causes account for about half of all deaths. As a result of its study, the Committee called for seven specific changes in the current American diet. The Dietary Goals for the United States were updated in January, 1978. The revised goals are listed here:

1. Increase the consumption of complex carbohydrates and naturally occurring sugars from about 28 percent of energy (caloric) intake to 48 percent.

2. Reduce overall fat consumption from approximately 40 to 30 percent of energy intake.

3. Reduce saturated fat consumption to account for about 10 percent of total energy intake; and balance that with polyunsaturated and monosaturated fats, which should account for about 10 percent of energy intake each.

4. Reduce cholesterol consumption to about 300 milligrams a day.

5. Reduce the consumption of refined sugars by about 40 percent to account for about 15 percent of total energy intake.

6. Reduce salt consumption to about 15 grams a day.
7. To avoid excess weight, consume only as much energy (calories) as is expended; if overweight, decrease energy intake and increase energy expenditure. (Dietary Goals for the U.S.)

As can be seen from the Senate Select Committee's recommendations, three of the seven recommendations refer directly or indirectly to the consumption of sugar in our diets. One of the major challenges to kicking the sugar habit -- and one not helped when sugar substitutes are used -- is that our tastes have been so perverted that the natural sweetness of foods eludes us.

All of us could do better if we ate a more nourishing diet and took some vitamin and mineral supplements. This can be accomplished mainly by avoiding all sugars, processed foods in which so much hidden sugar is found, and reducing the consumption of dairy and beef fat. We need to persuade all shoppers to follow this dictum: buy only nourishing foods. If sweets are in the house, they will be eaten. If there is diabetes, alcoholism, or obesity in the family genes, sugar in any form should be a major taboo. (Smith, p. 216)

These nutritional ideas are not for everyone, only for those who wish to feel better and live longer. We must explore the myth that cavities, sickness, headaches, and moodiness are inevitable. "Health is too important to leave completely in the hands of doctors." (Smith, p. 214) Preventative medicine is often more effective than curative medicine. Each of us must take responsibility for our own health, starting with the foods we eat.
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Chanse, Janet, "Obesity in the Land of Milk and Honey,"  
-Looks at many factors contributing to obesity in this  
country.

Cheraskin, E., and Ringsdorf, W.M. Predictive Medicine;  
A Study in Strategy, California, Pacific Press  
-Cites strategies for reducing disease by changes in the  
diet.

The Center for Science in the Public Interest, "Getting Kids  
-An article aimed at changing children's viewpoint about  
what a balanced diet consists of.

"Dietary Goals for the United States," Senate Committee on  
Nutrition and Human Needs, United States Senate, 1977.  
-The goals and changes recommended by the Committee in  
regards to the present state of the American diet.

-A well documented, scientifically based book that the  
lay person can understand.

Eat, Drink, and Be Wary, Churchill Films, Los Angeles, CA 1976.

Feingold, B.F., and Helen S., The Feingold Cookbook for  
Hyperactive Children and Other Problems Associated with  

Fredericks, Carlton, Look Younger, Feel Healthier, New York,  
Grossett and Dunlap, 1976.


The Learning Seed Company, "Our Changing Diet; The Soft Drink Revolution," Multimedia Kit, 1982. A filmstrip presentation on the history and present use of soft drinks in the U.S.


Peavy, Linda S. and Pagenkopf, Andrea Ph.D., Grow Healthy Kids, Grosset and Dunlop, 1980.

Phlegar, Fred L. and Phlegar, Barbara, Diet and School Children, Phi Delta Kappan, 61; 53-6, September, 1979.

- Research findings about causes and effects of obesity.

- Discusses food processing trends and the effort food processors use to find a new market in the Third World countries.

- Covers behavior problems from bedwetting to hyperactivity of preschoolers to adult alcoholism and drug abuse.

- Designed for advise to parents to enhance the health and well being of their children. Includes nutritious recipes that would be acceptable to children.

- Discusses nutrition in relation to classroom behavior.

- Relates mood changes to glucose in the blood stream.


The rationale for writing the faculty information sheet was to prepare a one page sheet, which I titled "Ten Facts About Sugar," that summarizes the findings I have discovered from doing this project. It is short in hopes that others will take time from their busy schedules to read it. It will, hopefully, arouse their interest enough to ask for more information.
THE FACTS ABOUT SUGAR

1. The consumption of sugar has risen from 8 pounds per capita per year in 1820 to 130 pounds per capita per year in 1984.

2. The high consumption of sugar is related to a number of serious health problems, including:
   - heart disease is the #1 cause of death in the U.S.;
   - one half of all Americans lose all their teeth by age 50;
   - the risk of cancer of the colon is increased from a diet lacking in fiber;
   - seventy percent of the adult population in the U.S. is overweight. There is evidence that obesity reduces the life expectancy by 33%;
   - sugar accelerates aging by causing an overabundance of white cells which slows the creation of new tissue.

3. In experiments with animals, it was found that animals survived longer on a diet of water alone than on a diet of sugar and water.

4. Sugar can effect behavior. Too much sugar makes one sleepy and our ability to calculate and remember is reduced. Too much or too little glucose in the blood causes mood swings that effect behavior.

5. Sugar is a vitamin thief. The digestion of sugar requires the body to expend B vitamins in order to digest it while it contributes nothing but energy.

6. Honey is not better than sugar. Honey breaks down in the body the same way that table sugar does. Honey contains only trace amounts of minerals which are not sufficient to change its net effect on the body.

7. Processed foods contain many hidden sugars. Careful label reading is required to detect the hidden sugars. If the first or second ingredient on the label is sugar, you can be sure that the product is mostly sugar.

8. If only a fraction of what is already known about the effects of sugar on the body were to be revealed in relation to any other material used as a food additive, that material would be banned.

9. Sugar coated cereals have more in common with candy than breakfast cereals and should be sold on the candy shelf of the grocery store.

10. With 9 teaspoons of sugar in a 12 oz. soft drink, 1/4 of our total sugar consumption comes from soft drinks. There are more soft drinks consumed in the U.S. than milk and fruit juice combined.

Recommendations:

It is recommended that Americans reduce the consumption of refined sugars by 40%. Increase the consumption of complex carbohydrates from 28% of the caloric intake to 48%.

For more information about the effects of sugar on health, contact Janet Griffith at Norco Senior High School, Home Economics Department.
APPLICATIONS FOR CLASSROOM USE - OBJECTIVES

In researching for this project, I find that our intake of sugar is tied to our food habits. It is impossible to discuss sugar without including information about label reading, fast foods, snack foods, and soft drinks. Each of these is involved with our over consumption of sugar; therefore, many of these lessons about sugar are integrated within other topics.

The unit on sugar presents eight lessons that can be chosen in any order that the instructor prefers. The unit is intended for the high school level though it would be adaptable to junior high or the elementary level.

From past experience with high school students, I would not present these lessons in the traditional sense of a "unit." I would use the infusion process and spread the lessons throughout the semester interspersed with other topics so the students would not get bored with the topic.

The lessons presented would be appropriate for use in the foods classes and in a class on our campus called "On Your Own", which combines marriage and personal relations with consumer skills. In other departments on campus an appropriate place for these lessons would be in the State Requirements Classes which include a unit on nutrition.

I have purposefully not included units in cooking since I primarily wanted to emphasize the nutritional side of the issue and not the food preparation side. This way the unit could be used in other areas of the curriculum other than a foods class.
UNIT 1

OUR CHANGING FOOD SUPPLY

Lesson Plan
Supermarket Scavenger Hunt
Dictionary of Common Food Additives
UNIT 1

OUR CHANGING FOOD SUPPLY

Generalizations:

1. With the use of processed foods steadily increasing, the American diet is changing from natural foods to processed foods containing high amounts of sugar, food additives, and sold with the influence of advertising.

2. Much of the nutritional value of food is lost through processing.

Objectives:

The student will be able to:

1. Identify ways in which our food supply has changed in the past 20 years.
2. Differentiate between the process of enrichment and fortification as they relate to nutritional value of foods.
3. Identify the major food additives and their use in foods.
4. Analyze food labels for additives, nutritional value of the food, and sugar content of foods.
5. List the nutritional value of commonly eaten foods.
6. Examine his/her own eating habits to see where changes can be made.

Suggested Activities:

1. Discuss how our foods have changed in the past 20 years.
2. Show film, Eat, Drink, and Be Wary.
3. Discuss our food habits and why we eat what we eat. How do we choose foods? Nutritional value, advertising promotion, easy availability, habit, or simply what "tastes good."
4. Do a survey in a market of several "convenience" foods. Compare the price of individual ingredients from which they are made. Make an estimate of how much "convenience" costs.
5. Have different groups compare "convenience" foods to foods made from scratch. Compare the difference in time to prepare.
6. Students will look through their kitchens at home or the market for kinds of items in "Supermarket Scavenger Hunt." Discuss the results.
7. Have students do research on a single food additive. The additive, selected may be one that is accepted, controversial, or banned. Have them investigate what it does, why it is used, and what kinds of assurances of safety exist. Report findings to the class.
8. Set up a television monitoring project and determine which foods are advertised to children, teenagers and adults. Is there any relation between nutritional value and most advertised foods?

9. Have the students do research and then conduct a debate in your class on the question of whether television advertising of nutritious "junk foods" should be controlled or limited.

Resources:

- Film *Eat, Drink, and Be Wary*
  Churchill Films
  662 North Robertson Boulevard
  Los Angeles, CA  90069

- Food labels.
- Supermarket Scavenger Hunt.
- Dictionary of Common Food Additives
  From The Learning Seed, "Supermarket Survival,"
  Multimedia Kit.

Evaluation:

Participation in discussions.
Comparison of Convenience Foods and Made From Scratch Foods.
Completion of Supermarket Scavenger Hunt.
Report on Food Additives.
Research and Debate on "Junk Foods" - Should They Be Controlled Or Limited?
SUPERMARKET SCAVENGER HUNT

1. Find one food other than a spice that costs more than $5.00 per pound.

2. Find some cherry flavored food that contains no cherries.

3. Find some food that contains TVP.

4. Find some food that is not enriched, fortified and contains no additives.

5. Find the main ingredient in the chocolate coating on ice cream bars.

6. Find a food package with a picture on it that looks better than the contents of the package.

7. Find two breakfast cereals that do not contain sugar.

8. What company makes Jello and what company is its largest competitor in selling flavored gelatin?

9. Find two package food items that do not list ingredients.

10. Find an example of a tie-in display.

11. Find five different foods that have water as the main ingredient.

12. Find one example of the lowest shelf space given to basic food.

13. Find brand of peanut butter with the fewest additives.

14. Find a maple syrup that contains maple syrup.

15. Find a food that contains real chocolate—baking chocolate, chocolate chips, candy or syrup are not allowed.

16. Find one merchandising technique used to encourage shoppers to stay in the store longer.

17. Find a candy display aimed at small kids.

18. Find one example of prime shelf space given to luxury items.
19. Find an example of multiple pricing.
20. Find a package with nutrition information printed on it.

22. What is the main ingredient of a Hostess Twinkie?

23. Find a product that contains an emulsifier. Name both the food and the emulsifier.

24. Find a product that contains a preservative. Name both the food and the preservative.

25. Find two products that are labelled as "fortified" or "enriched."

26. Find a freshness code dated next year.

27. What is the most commonly found main ingredient in baby food?

28. Find a cracker that does not contain artificial color or flavor or enriched flour.

29. Find a food with the word "creme" in its brand or on the label.

30. Survey the vending machines in your school. What is the main ingredient sold through them?

31. What is the difference between Mayonnaise and Kraft's "Miracle Whip?"

32. In someone's pantry (not at a grocery), find 3 different foods made by the same company.

33. Find a food in which the ingredient list is the most impossible to read. Do not use a food used in filmstrips.

34. Find a food package that is designed to make it look like there is more inside.

35. Find the worst frozen dinner. Why is it the worst?

36. Find the price difference between brand name aspirin and store brand aspirin. What is the price of each and which brands are you comparing?

37. Find a bread that is not made with enriched flour and contains no additives.
30. Find a main dish with water as the main ingredient.

31. Find the best brand of frozen fruit pies. Why is it the best?

32. Find a food containing Hydrolyzed Vegetable Protein.

33. Find the soup that gives the most food per dollar. Why does it give the most per dollar?

34. Find the best brand of corn beef hash. Why is it the best?

35. Find the product with an ingredient list the most like non-dairy creamer.

36. Find the most expensive way to buy corn. What is the cost per lb. for each type compared?

37. Find the brand of hot dogs with the worst ingredient list. Why is it the worst?

38. Identify the chemical used to give hot dogs a pinkish color.

39. Translate into plain English the ingredient list on Top Job cleaning fluid.

40. Find a pickle that has no chemical additives. What brand?
Dictionary of Common Food Additives

ASCORBIC ACID (a-score'-bic)—another name for Vitamin C. About 70-100 milligrams per day is needed for an adequate diet; approximately the amount in a glass of orange juice or one orange. Vitamin C is inexpensive—about 2¢ worth can supply forty people with their daily requirement. A food that has “Vitamin C added” is not necessarily nutritious. Vitamin C also helps keep some foods fresh.

BHA and BHT—abbreviations for Butylated Hydroxyanisole (BHA) and Butylated Hydroxytoluene (BHT). Preservatives often used to prevent oil from turning rancid. They are not the most effective preservatives and some tests have raised questions about their effect on health. They are best avoided since they do not in any way contribute to health or nutrition. Many oil products stay fresh without the use of BHA or BHT.

CALCIUM CARBONATE—better known as chalk.

CALCIUM PROPIONATE—see PROPIONIC ACID

CALCIUM SULFATE—a white, odorless, tasteless powder used as a thickening agent. Also used in beer, wine, and baked goods as a yeast food. Used in cheese, artificially sweetened fruit, jelly, some canned vegetables, some cottage cheese. It is also known as plaster of Paris and is used in cement and wall plaster as well as in insecticides.

CARRAGEEN (car'-a-jean)—a carbohydrate made from seaweed and named after the city of Carragheen, Ireland. It is used as a thickener to give body to ice cream, jelly, sour cream, syrup, whipped toppings and other foods. It is in some ways similar to gelatin but is a plant rather than animal product. Some experiments have indicated it might have some relation to ulcers, others have suggested it be avoided completely in baby foods.

CITRIC ACID—an ingredient found naturally in citrus fruits, especially lemons. It gives a tart taste to foods and is also used to prevent spoiling. Fifty million pounds of citric acid are used each year in the United States.

SODIUM CITRATE is part of Citric Acid and is used as a buffering agent to control the amount of acidity in some foods.

CORN SWEETENER—see CORN SYRUP

CORN SYRUP—the same or similar to corn sugar, corn sweetener, dextrose and glucose. According to Eater's Digest, corn syrup is “a sweet, thick solution made by digesting cornstarch with acids or enzymes.” It is used both to sweeten and thicken. In candy it slows the crystalization of sugar and keeps moisture in cakes, cookies and whipped foods.

If the corn syrup is dried it is called CORN SYRUP SOLIDS. By itself corn syrup is clear, odorless and nearly tasteless.

DEXTROSE—see CORN SYRUP

DICOTTO POTASSIUM PHOSPHATE—used to control the degree of acidity in foods that should be kept cold but not frozen solid. It is also used in nondairy creamers and cheese.

FOOD STARCH—see MODIFIED FOOD STARCH

GLUCOSE (glue'-cose)—see CORN SYRUP

GLYEROL (gliis'-a-roll)—see PROPYLENE GLYCOL

GUAR GUM (gwar)—made from a plant grown in the United States chiefly to feed cattle. It is a stabilizer used as a thickening agent in beverages, ice cream, puddings, baked goods and salad dressings.

GUM ARABIC—when the acacia tree is cut or wounded a substance oozes out to protect the bark—that substance is called Gum Arabic. In 1970, the U.S. imported 29 million pounds of it, mainly from Africa and Arabic lands. It is used to thicken; it gives a smooth texture and good mouth-feel to ice cream and other products. It also prevents sugar crystals from forming in candy, helps citrus oils stay dissolved in drinks, keeps flavor oils in powdered drink mixes and stabilizes the foam in beer.

HYDROLYZED VEGETABLE PROTEIN (hi'-dral-ized)—is used most often as a flavor enhancer. It is usually made by chemically treating soybean protein to reduce it to amino acids.

ISOLATED SOY FLOUR—see TEXTURED VEGETABLE PROTEIN

LACTIC ACID—is found naturally in many foods. It adds tartness to frozen desserts, fruit drinks and other foods. A salt of Lactic Acid, CALCIUM LACTATE, prevents fruits and vegetables from discoloring and improves dried and condensed milk.
LACTOSE (lack'-toes)—is a natural ingredient in milk. When bacteria changes the lactose in milk to lactic acid (see above) the milk has soured. Lactose is a carbohydrate used in whipped toppings, pastry products and other foods. It is about one-sixth as sweet as sugar.

PECTIN—is a carbohydrate found in many fruits and vegetables. When fruit ripens, the pectin in it breaks down and causes the fruit to become soft. Pectin is a gelling agent and is used to thicken foods such as soup or gravy. Food starch (usually made from cornstarch) is modified so it dissolves. Lecithin is made from soybeans and is inexpensive since it is considered a waste product.

LECITHIN (less'-a-tin)—is a part of most plants and animals and a good diet should contain about an ounce each week. Lecithin is made from soybeans and is inexpensive since it is considered a waste product.

Lecithin is an anti-oxidant, this means it slows down spoiling. It is less effective but probably safer than other anti-oxidants such as BHA, BHT and propyl gallate. In some foods lecithin is an emulsifier and promotes the mixing of oil (or fat) and water.

MALTOL—a powder made from tree bark, pine needles, chicory or roasted malt. It gives an imitation "freshly baked" flavor to baked goods. It is also used as a flavoring agent to help produce imitation coffee, fruit, nut and vanilla flavors.

MODIFIED FOOD STARCH—starch is a natural part of foods such as flour, potatoes and corn. It is relatively inexpensive and has the ability to absorb large amounts of water; therefore, it is often used to thicken foods such as soup or gravy. Food starch (usually made from cornstarch) is modified so it retains an acceptable texture, doesn't harden, etc.

MONO- and DIGLYCERIDES (dye-gliss'-er-ides)—are present in many foods naturally and make up about 1% of normal food fat. According to Eater's Digest, mono- and diglycerides are "safe and wholesome." They are used to make bread softer, prevent spoiling, make cake fluffier, decrease the stickiness of caramel, prevent the oil in peanut butter from separating out and much more.

MONOSODIUM GLUTAMATE (glue'-ta-mate)—brings out the flavor in products with protein. It is used in soups, meat, seafood, poultry, cheese and sauces. In chili, for example, monosodium glutamate (often abbreviated as MSG) can be used to make the chili taste like it has more meat. It is sold by itself under the brand name of Accent.

PECTIN—is a carbohydrate found in many fruits and vegetables. When fruit ripens, the pectin in it breaks down and causes the fruit to become soft. Pectin is a gelling agent and is used to thicken barbecue sauce, frosting and yogurt.

POLYSORBATE 60—is an emulsifier—it helps keep oil dispersed in water. In candy, ice cream and beverages polysorbate 60 helps keep flavor oils dissolved.

PROPIONIC ACID (pro-pea-on-ick)—is found naturally in some foods, especially Swiss cheese. Propionic acid is a source of nutrition and is among the safest of all food additives. One common use is to prevent the growth of mold on baked goods. It can be used and listed as either CALCIUM PROPIONATE or SODIUM PROPIONATE.

PROPYLENE GLYCOL (prop’e-a-lean gly’col)—is an additive that helps maintain moisture and a nice texture to foods such as baked goods, candy and icings, shredded coconut and pet foods. Other related additives that serve similar purposes are propylene glycol monostearate, glycerol and sorbitol.

SODIUM CASEINATE (case’-in-ate)—a white odorless powder made from dried milk. It is used to help the texture of ice cream (it is much cheaper than cream) and other frozen desserts. Casein is milk solids, the liquid left is called whey.

SODIUM CITRATE—see CITRIC ACID

SODIUM NITRATE and SODIUM NITRITE—give the pinkish color to hot dogs, ham, lunch meat, bacon and other meats. The additive also helps prevent the bacteria that can cause botulism. Sodium nitrate stands as one of the most dangerous food additives and should be avoided whenever possible. Heated debate about the value and safety of these additives has raged for many years.

SODIUM PROPIONATE—see PROPIONIC ACID

SORBITOL—is about 60% as sweet as sugar and is most often used to give sweetness and help maintain the proper moisture levels.

TEXTURED SOY PROTEIN or TEXTURED SOY FLOUR—see TEXTURED VEGETABLE PROTEIN

TEXTURED VEGETABLE PROTEIN—protein can be isolated from soybeans and used as a nutritious product. It in itself is nutritious but is usually found in combination with dozens of other additives. The price of such substitute food is often based not on the relatively inexpensive TVP, but on the price of the food being imitated.

VITAMIN C—see ASCORBIC ACID

WHEY (way)—after the milk solids (casein) have been removed, the remaining liquid is called whey.

Note: Pronunciation guides are only approximate.
UNIT 2

SUGAR INTAKE

Lesson Plan
Dietary Computer Analysis
UNIT 2

SUGAR INTAKE

Generalizations:
1. Processed foods contain "hidden" sugar.
2. There are many types of sugar--natural and refined.
3. There are many forms of sugar that appear on the labels of foods.
4. There is a relationship between the consumption of sugar and health.

Objectives:
The student will be able to:
1. Identify the various forms of sugars and their sources.
2. Identify names for sugar that are used in labeling foods.
3. Classify foods into various classifications depending on their sugar content.
4. Discuss sugar and its relationship to health.

Suggested Activities:
1. Students will keep track of the food they eat over a 24 hour period. They will then transfer their information onto the "Sugar Computer Prep Form".
2. Class discussion on the types and forms of sugar present in foods.
3. Students will use the computer to determine sugar content of their food consumed. User time with the computer should be 2 to 3 minutes if the student is prepared when he/she sits down at computer.

Rationale for use of computer:
This program is designed to teach the approximate amount of sugar added to 25 different commonly consumed food categories. Using data from the resource section, sugar quantities were averaged for the food categories. Foods with only natural sugar were omitted so you won't find milk, juices with no added sugar, etc. Categorizing foods into 25 or 26 food groups is a reasonable number to learn nutrient content with some degree of accuracy. It is also practical when computer time is at a premium. The program was designed to take each user only about 2 minutes to execute and obtain a total sugar intake. The sugar intake is compared to the number of teaspoons which would equal 10% of 2400 calories.
Evaluation:

Computer printout
Discussion of results.

Resources:

Computer Print Out by Betty Clamp, Ohlone College
Center for Science in the Public Interest, NUTRITION ACTION
Dietary Goals
American Dental Association, HIDDEN SUGAR
Sugar Intake Dietary Computer Analysis

Instruction to Students:

1. Type in RUN "SUGAR" and press ENTER key. This will load and begin execution of the program.

2. Do a 24 hour food recall. Then use the prep sheet. However you can use a record of as many days as you want to.

3. Respond by typing a number indicating the number of servings of a food category. For 0 servings, just press ENTER key.

4. For parts or fractional servings, use a decimal.

5. If an error is made, press BREAK key, type RUN, and press ENTER key and run it again.

6. A printout of what is on the video screen may be obtained at any time by pressing SHIFT, ↓, * keys in that order.

7. To obtain a table listing the teaspoons of sugar in the food categories, simply run the program to the question "Do you want to determine your sugar intake?" and type N.
FOOD CATEGORY INFORMATION

All-Bran
  Kellogg's Raisin Bran
  Quaker Kife
  Nabisco Bran

Apple Jacks
  Fruit Loops
  Sugar Smacks
  Instant Quaker Oatmeal

Granola
  Quaker Natural
  Country Morning

Sugar Pops
  Alpha Bits
  Sugar Frosted Flakes
  Boo-Berry
  Cocoa Puffs
  Count Chocula
  Lucky Charms
  Captain Crunch
  Crazy Cow
  Cookie Quisp

Wheaties
  Total
  Kix
  Cheerios
  Special K
  Corn Flakes
  Rice Krispies

Cake Plain
  Donut
  2 muffins
  pie

Drinks
  Drinks
  Drinks
  Cool-Aide
  Lemonade
  Hi-C

Gum
  Lifesavers

Cookies
  Graham cracker
  Brownie = 2

Cocoa
  Chocolate Milk
<table>
<thead>
<tr>
<th>ITEM</th>
<th>Item</th>
<th>Measurement</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>All-Bran</td>
<td>1/3 Cup</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Apple Jacks</td>
<td>1 Cup</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Granola</td>
<td>1/3 Cup</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Sugar Pops</td>
<td>1 Cup</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Wheaties</td>
<td>1 Cup</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Cookies</td>
<td>1 Cookie</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Cake (plain)</td>
<td>1 slice</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Cake (iced)</td>
<td>1 slice</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Candy bar</td>
<td>1 bar</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Chocolate mint</td>
<td>1 piece</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Canned fruit</td>
<td>1 piece</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Cocoa</td>
<td>1 Cup</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Catsup</td>
<td>1 Tbsp</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Drinks</td>
<td>6 ounces</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Soda pop</td>
<td>12 ounces</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Gum</td>
<td>1 stick</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Ice cream</td>
<td>1 scoop</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Jello</td>
<td>1/2 Cup</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>Jelly</td>
<td>1 teaspoon</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>Poptarts</td>
<td>1 tart</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>Pudding</td>
<td>1/2 Cup</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>Sugar</td>
<td>1 teaspoon</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>Syrup</td>
<td>1 Tbsp</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>Yogurt, flavored (vanilla)</td>
<td>1 Cup</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>Yogurt with fruit</td>
<td>1 Cup</td>
<td></td>
</tr>
</tbody>
</table>
PROGRAM (OR FILE) NAME: SUGAR
PURPOSE: DETERMINE APPROXIMATE SUGAR INTAKE
PROGRAM DEVELOPED BY: OHLONE COLLEGE CFS DEPARTMENT
BETTY CLAMP, INSTRUCTOR
FREMONT, CALIFORNIA 94539
DEVELOPMENT FUNDING: GRANT # 5-2-977-01 DEA SUBPART S
COPYRIGHT 1983: CALIFORNIA COMMUNITY COLLEGES
CHANCELLOR’S OFFICE
PROJECT MONITOR: DR. PAULETTE PERRUMO
RESOURCES: CONSUMER AND HOMEMAKING SPECIALIST
CHANCELLOR’S OFFICE
CALIFORNIA COMMUNITY COLLEGES
CSP
DIETARY GOALS 1977
J. AMER. DENTAL ASSN.

ON ERROR GOTO 1150
CLEAR 1200
SRS="***********"
REM =CLS
DIM IT(25), FO$(25), POS(25), WT(25), NA(25)
FOR I=1 TO 25: READ IT(I), FO$(I), POS(I), WT(I), NA(I)
NEXT I
POKE 169: 6: TN=0: CLS
PRINT TAB(15); "SUGAR INTAKE PROGRAM": PRINT TAB(6); "(C) 1983 CALIFORNIA COMMUNITY COLLEGES": PRINT
PRINT "HELLO! I’M TRS-80, THE TRAVELING COMPUTER."
PRINT
INPUT "WHAT IS YOUR NAME"; NAME$ & CLS
PRINT "DO YOU WANT A LIST OF FOODS YOU MAY SELECT FROM?"
INPUT "(Y/N)"; A$ & IF A$="Y" THEN 370
CLS
PRINT "YOU SUGAR INTAKE MAY BE DETERMINED USING THIS "
PRINT "LIST OF SELECTED FOODS."
PRINT "" & INPUT "DEPRESS ENTER TO CONTINUE"; A$ & CLS
FOR I=1 TO 21 STEP 4
PRINT IT(I);TAB(1);FO$(I);TAB(15);IT(I+1);TAB(18);FO$(I+1); FO$(I+1)
PRINT TAB(30);IT(I+2);TAB(33);FO$(I+2); & )
PRINT TAB(45);IT(I+3);TAB(46);FO$(I+3)
NEXT I
PRINT IT(25); FO$(25)
PRINT "": INPUT "DEPRESS ENTER TO CONTINUE"; A$ & CLS
PRINT "DO YOU WANT TO DETERMINE YOUR SUGAR INTAKE?"
INPUT "(Y/N)"; A$ & IF A$="Y" THEN 530
CLS
PRINT "ITEM :"; TAB(10); "FOOD"; TAB(25); "PORTION"; TAB(40);"SUGAR (TSP)"
FOR I=1 TO M
PRINT IT(I);TAB(18);FO$(I);TAB(25);POS(I);TAB(40)
NEXT I
INPUT "DEPRESS ENTER TO CONTINUE"; A$ & CLS
IF I=10 THEN 510
DEPRESS ENTER TO CONTINUE"; A$ = "SUGAR ENTER TO CONTINUE"; B$ = "SUGAR ENTER TO CONTINUE"; A$ = "SUGAR ENTER TO CONTINUE"; B$ = "SUGAR ENTER TO CONTINUE"

CLS: GOTO 610
CLS: PRINT "ENTER THE NUMBER OF SERVINGS OF EACH FOOD EATEN."
CLS: PRINT "ENTER FRACTIONAL PARTS OF A SERVING AS A DECIMAL NUMBER.
CLS: PRINT "EXAMPLE: ONE THIRD SERVING IS ENTERED AS .33"; INPUT "P
CLS: PRINT "DEPRESS ENTER TO CONTINUE"; A$ = "SUGAR ENTER TO CONTINUE"; B$ = "SUGAR ENTER TO CONTINUE"
CLS: POKE 16916,3; PRINT " "
CLS: PRINT "FOOD"; "PORTION"; "SERVING"; PRINT " "
CLS: FOR I = 1 TO 25
CLS: REM * READ IT(I); F0S(I); P0S(I); WT(I); NA(I)
CLS: PRINT IT(I); F0S(I); P0S(I); " "
CLS: INPUT AM
CLS: SD = AM * NA(I); TN = TN * SD
CLS: POKE 16916,0; CLS: POKE 16916,3; PRINT: PRINT: PRINT
CLS: IF TN > 120 THEN TG = 120 ELSE TG = TN
CLS: HT = TG / 2; HTX = HT
CLS: PRINT "MAXIMUM SUGAR RECOMMENDED IS 13 TSP. (ABOUT .25 CUP)"
CLS: PRINT NMS;" YOUR SUGAR INTAKE WAS ";TN;" TSP. OF SUGAR"
CLS: PRINT
CLS: PRINT "SAFE " ; FOR I=1 TO 6; PRINT CHR$(143); NEXT I; PRINT CHR$(133)
CLS: IF HT > 1 GOTO 730
CLS: IF HT < .25 GOTO 740
CLS: PRINT CHR$(133); GOTO 740
CLS: PRINT "YOU " ; FOR I=1 TO HTX; PRINT CHR$(143); NEXT I; IF HT-H
CLS: IF HTX < 0 THEN PRINT CHR$(133); ELSE PRINT CHR$(126)
CLS: PRINT NMS;" YOUR SUGAR INTAKE WAS ";TN;" TSP. OF SUGAR"
CLS: IF TN < 13 THEN 790
CLS: IF TN < 13 THEN 790
CLS: IF TN < 13 THEN 790
CLS: FL = SR$ + " FAT CITY HERE I COME " + SR$ + " YOU MUNCHE " ;TN-13;" TSP. SUGAR MORE THAN
CLS: PRINT NMS; " YOUR " ;TN;" TSP. SUGAR IS LESS THAN T MAXIMUM 13 TSP. RECOMMENDED"
CLS: FL = SR$ + " A OK " + SR$ + " DO YOU WANT TO RUN THIS PROGRAM AGAIN ? (Y/N)"
CLS: A$ = INKEY$ .
CLS: IF A$ = "Y" THEN 170
CLS: PRINT&64;FL$; IF A$ = "N" THEN 880
CLS: FOR Z = 1 TO 120; X = 1; NEXT Z
CLS: PRINT&64;" "
CLS: FOR Z = 1 TO 10; X = 1; NEXT Z; GOTO 820
CLS: POKE 16916,0; CLS: PRINT "SUGAR INTAKE PROGRAM ----END"
CLS: DATA 1; "ALL-BRAN"; "1/3 CUP"; 0; 1
CLS: DATA 2; "APPLE-JB"; "1 CUP"; 0; 4
CLS: DATA 3; GRANOLA; "1/3 CUP"; 0; 1.5
CLS: DATA 4; "SUGAR POPS"; "1 CUP"; 0; 3
CLS: DATA 5; WHEATIES; "1 CUP"; 0; 5
CLS: DATA 6; COOKIES; "1 COOKIE"; 0; 2
CLS: DATA 7; "CAKE-PLAIN"; "1 SLICE"; 0; 5
CLS: DATA 8; "CAKE-ICED"; "1 SLICE"; 0; 10
CLS: DATA 9; "CANDY BAR"; "1 BAR"; 0; 7
CLS: DATA 10; "CHOC MINT"; "1 PIECE"; 0; 2
CLS: DATA 11; "CAN FRUIT"; "1 PIECE"; 0; 3

-52-
UNIT 3

CALORIES COUNT

Lesson Plan

Transparencies -

Why Do We Eat?
Scrambled Answers

What Is A Calorie?

Calories Provide Energy For . . .

Cut Down Not Out

Basal Metabolism Rate

Activities

Calories Used For Additives

Hints For The Sedentary To Avoid Weight Gain
CALORIES COUNT

Generalizations:

1. Energy intake must be balanced with energy expenditures to control body weight.
2. Energy cannot be destroyed or created. It can only be transformed; therefore, food energy taken in excess of body needs must be stored.
3. Daily and routine exercise and a well balanced diet can help control weight. Achieving ideal weight can have a positive effect on the overall well being of the individual

Objectives:

The student will be able to:

1. Know the definition of a calorie and Basal Metabolism Rate (BMR).
2. Provide information by which an individual's diet can be evaluated.
3. Recognize foods high and low in calories.
4. Explain what is meant by empty calories.
5. Analyze personal body weight and ideal weight and modify food selection patterns to improve diet when necessary.
6. Identify the correlation between calorie intake and calorie expenditure.

Suggested Activities:

1. Using the transparencies "Why Do We Eat?", have students respond with possible answers that might be given by Cathy. Discuss what can happen to our bodies when we eat for the wrong reasons and consume more calories than our body needs. (Another variation of this activity is to make a transparency of the scrambled responses. Cut the responses into strips and have students unscramble Cathy's answers).
2. Using transparencies provided, discuss the definition of a calorie and BMR and the relationship between calorie intake and calorie expenditure.
3. Students keep track of activities for three days. Using the transparency "Calories Used for Activities" have students rate themselves as to the type of activities in which they most often participate.
4. Students use ideal height-weight chart in text book and calculate proper calorie intake for ideal weight. Multiply ideal weight by 15 to see how many calories you should consume per day. Use 25 x ideal weight for those who engage mostly in strenuous exercise.
5. Students recall foods eaten in the past 24 hours and calculate the number of calories consumed. Discuss whether calorie intake was too high or too low in terms of activity level.

6. Students brainstorm foods high and low in calories. Discuss what are the characteristics of foods most often high in calories and what are the characteristics of foods low in calories.

7. Ask students to respond to, in writing, what they feel is meant by the term "empty calories" and give examples if possible. Discuss the meaning i.e. foods high in calories but empty or nearly devoid of nutrients. (Examples: soda pop, imitation whipped cream, candy, chips.)


9. Plan a diet workshop--invite other classes to attend. The workshop could include:
   a. Student handouts explaining diets and nutrition needs.
   b. Snack testing or display with calorie amounts noted.
   c. Health bar demonstrations.
   d. Demonstrations of food items using whole grain cereals.
   e. Audio-visual corner.

Evaluation:

Have students assess their own dietary and exercise habits and determine what modifications they need to make in their own lifestyle and diet.

Additional Resources:


Baily, Covert, Fat or Fit, Boston, Houghton Mifflin Company, 1977.

Calories: Food and Activity (Flip Charts) Cornell University, Media Services Printing--B-10, Martha Van Renssclair Hall, Ithica, N.Y.

WHY DO WE EAT?

WHY DO I EAT?
SILLY QUESTION...
I EAT BECAUSE
I' m in Olev
I' m MlSenooe
I want Proaapvl
I need Tasust
I' m Vrcateel
I need Ysutrnce
I deserve Shpimtneun
I deserve A rWader
what is a calorie?

A calorie is a measure of the energy that food produces.

Everyone needs calories!
Calories provide energy for:

- Sleeping
- Eating

Plus added calories are needed for:

- Walking
- Running
- Swimming
just being ALIVE!

cut down not out!
BMR is the Basal Metabolism Rate

This is the speed at which the body uses energy for basic processes.

Everyone has a different BMR

Depends on:
- Body build
- Age
- Sex
- Thyroid function
ACTIVITIES

some are SEDENTARY... that is why they take the least amount of energy

some are STRENUOUS...

that is why they take the most energy and use up the most calories
# Calories Used for Activities

## Types of Activities

<table>
<thead>
<tr>
<th>Activity Description</th>
<th>Calories per Hour</th>
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<tbody>
<tr>
<td>Sedentary, done while sitting, using little or no arm movement, eating, reading, writing</td>
<td>80 to 100</td>
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<tr>
<td>Light, done while standing, using some arm movement, also moderate activities done while sitting, preparing food, ironing, walking slowly, personal care, rapid typing</td>
<td>100 to 160</td>
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<td>Moderate, done while standing, using moderate arm movement, making beds, carpentry work, walking moderately fast</td>
<td>170 to 240</td>
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<td>Vigorous, heavy scrubbing, hanging out clothes, walking fast, gardening, bowling</td>
<td>250 to 350</td>
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<td>Strenuous, heavy labor such as construction work, action sports such as fast dancing</td>
<td>350 or more</td>
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adapted from Koutaluk, Discovering Nutrition
HINTS FOR THE SEDENTARY
TO AVOID WEIGHT GAIN

1. Eat three nutritious meals a day.

2. Avoid high calorie foods -- fats, sweets, and alcohol.

3. If you must snack, choose nutritious foods with fewer calories such as fresh fruits and raw vegetables, non-fat milk, unsweetened fruit juice, plain yogurt.

4. Count snacks as part of your day’s calories.
UNIT 4

VALUES IN NUTRITION

Lesson Plan
What Would You Do?

Case Problems
Twenty Things I Really Like To Do
VALUES IN NUTRITION

Generalizations:

1. A person's values determines the decisions he/she makes in every aspect of life.
2. Values are those things, ideas, and qualities cherished strongly enough to serve as a basis for decision making.
3. Values are influenced by family, friends, and relevant groups.
4. The value of health is one of the basis for the decisions we make daily concerning the food choices we make.

Objectives:

The student will be able to:

1. Define and demonstrate understanding of what values are.
2. Identify ways in which we develop our own value systems.
3. Prepare a value continuum on the value of health and identify behaviors that they choose that illustrate their position on the continuum.
4. Discuss and share ideas about a number of nutrition oriented situations that illustrate values in making food choices.

Suggested Activities:

1. Students will fill out worksheet, "Twenty Things I Really Like To Do."
2. Discuss how values are reflected in the activities in which we participate.
3. Lecture and discussion of values, and the process of valuing.
4. Students will form small groups and discuss the situations presented and decide how they would handle each situation. Each group will then report to the whole class how they would handle their situation.
5. Prepare a continuum on the value of health. Include the behaviors and decisions a person would make for each level of the continuum. Indicate where they would put themselves on this continuum and explain why they see themselves in this position.

Evaluation:

Participation in the class and group discussions. Completion of worksheets and value continuum.
WHAT WOULD YOU DO?

1. You have a friend who you have noticed is steadily gaining weight. The weight gain has been recent. You have observed your friend at snack, at lunch, and after school eating candy bars, soda pop, and chips on a regular basis. This is a change in eating habits that has occurred in the last few months.

Discuss:
Is it your place to encourage them to cut down on the amount of calories they are eating?
What would you say to your friend.

2. You have a friend that habitually skips breakfast every morning. You have observed that your friends parents both work and leave the house in the morning before your friend is up. Each day before the snack break in the morning, your friend becomes edgy and nervous. By 4th period each day she is so edgy that she is unable to concentrate on her classwork. Her grades are generally pretty good except for the class period right before lunch.

What might you recommend to your friend that will help them get through the morning with less problems.

3. Your friend, Tom, is into sports. He heard that if you eat a candy bar before an athletic event, you will have more energy and will do better in that activity.

Take a few minutes to explain, nutritionally, how a candy bar works at quick energy as well as the long range effects of the candy bar after the first energy burst.

4. Lisa is into eating at fast food restaurants each day. She has recently become very weight conscious and concerned about getting a balanced meal and improving her health.

Discuss with Lisa the food choices that can be made when eating out to keep her diet balanced at the fast food restaurants that she frequents.

5. You are a vegetarian. Encourage your friends to follow your eating habits. Include the benefits that a vegetarian diet gives to a person.
6. Since taking a class in nutrition, you have been concerned with the nutritional benefits of the food that you eat. Explain to a group of 3 of your friends why you are changing your food habits and what foods to plan to leave out of your diet and why each one will be left out.

7. You have just learned that your best friend has anorexia nervosa. You are aware of the serious consequences that this disease has on teenaged girls. How can you help your friend in this situation? Explain what you know about the disease and help your friend identify the reasons behind her behavior.
TWENTY THINGS I REALLY LIKE TO DO

Below, list 20 activities you enjoy doing.

11. Place a symbol next to each activity in the appropriate column according to the key below. There may be more than one symbol for each activity.

- $ - activity costs $5 or more.
- P - a people oriented activity.
- A - activities done alone.
- S - activities that would not have made your list 5 years ago.
- 5 - things you will outgrow in 5 years.
- * - the top 5 activities which are your most favorite.
- H - activities which require over one hour of your time each time you do it.
- Date - as close as possible list the last time you did each activity.
- I - activity takes place indoors.
- O - activity takes place outdoors.

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Adapted from J.C. Penney's Multimedia Kit: Values Clarification.
UNIT 5

OUR CHANGING DIET
THE SOFT DRINK REVOLUTION

LESSON PLAN
STUDY GUIDE FOR "THE SOFT DRINK REVOLUTION"

INFORMATION SHEET
HISTORY
NUTRITION
DANGERS
THE SOFT DRINK EXPLOSION
THE CAFFEINE PROBLEM
TOP TEN SOFT DRINKS
OUR CHANGING DIET:
THE SOFT DRINK REVOLUTION

Generalizations:
1. Soft drinks began as an occasional refreshment; today they are a major contributor to the national diet.
2. Soft drinks have replaced milk, juices, and even coffee as the beverage of choice for drinking between and with meals.
3. The average person will drink nearly forty gallons of soda pop this year and will find that soft drinks provide eight per cent of the calories consumed each day.

Objectives:
The student will be able to:
1. Trace the origins of the soft drink industry.
2. Identify some of the health hazards related to the present use of soft drinks in the American diet.
3. Recognize the effects of caffeine, saccharine and other sugar substitutes, and brominated vegetable oil on the body.
4. Prepare a plan for the intelligent use of soft drinks in today's diet.

Suggested Activities:
1. Discuss the present status of the soft drink in the U.S. diet today as compared with the diet of 1850. Use handout "The Soft Drink Explosion," to illustrate the changes that have taken place in the American diet in recent years.
2. Introduce the filmstrip, Our Changing Diet: The Soft Drink Revolution.
3. Students will view filmstrip and fill out study guide while watching and during discussion to follow.
4. Discuss the effect of soft drinks on the diet in regard to calories, food additives, sugar, and caffeine.
5. Discuss the consumptions of soft drinks in relation to what it leaves out of the diet.
6. Review the concept of empty calories.

Evaluation:
Completion of study guide and participation in class discussion.
Later, when planning meals, identify the beverages that are chosen to accompany the meals and have students identify why these choices were made.
Resources

Our Changing Diet: The Soft Drink Revolution
The Learning Seed Company

Handouts:
"The Soft Drink Explosion"
"The Caffeine Problem"
"Top Ten Soft Drinks"

Summary of Filmstrip
1. Originally carbonated water was considered a cure for what condition?

2. When was the first flavored, carbonated water introduced to the U.S.?

3. When John Pemberton originated Coca-Cola, it was sold as a drug for what ailments?

4. Today there are only trace amounts of what two drugs in Coca-Cola today? Are these amounts harmful?

5. What was the national average consumption of soda pop in 1980?

6. How does this consumption of soda pop compare to the consumption of milk and fruit juices at the same time?

Part II

7. What are the three ingredients in soft drinks that cause concern for our health?

8. How much sugar is contained in a 12 ounce cola?

9. How many calories are there in a 12 ounce cola?

10. Why is it a nutritional concern that soft drinks are replacing milk in the diet?

11. Why would real fruit juice be a better choice for a beverage than a soft drink with a meal?

12. What effect does caffeine have on the body?

13. Is caffeine addictive? What are the symptoms of caffeine withdrawal?

14. What proportion of the saccharin used in the U.S. is in soft drinks?

15. What ingredient is found in Fresca and orange sodas that has been removed from the FDA's Generally Regarded As Safe list (GRAS)?

16. What is the recommended place for soft drinks in today's diet?
History
The carbonated soft drink industry began as an attempt to imitate European mineral waters. The idea of flavoring the water with syrups wasn't conceived until around 1840.

In the U.S., soft drinks became popular first in the South after the Civil War. They were an alternative to alcohol. Early soft drinks were sold as tonics to cure ailments and relieve fatigue. Coca-Cola was thought of first as a "brain tonic" and only gradually as a refreshing drink.

Early formulae of many soft drinks, Coca-Cola included, contained significant amounts of coca leaf extract (from which also comes cocaine) and kola nut extract—a potent stimulant. Today's soft drinks do not have these drug contents. The only stimulant remaining is caffeine.

Nutrition
Coca-Cola, like many of today's soft drinks, began as a tonic, a kind of simple medicine to cure headaches and a wide assortment of ailments.

Coca-Cola's exact recipe is indeed a secret. But it is 99% sugar and water. The other one percent includes: caramel for coloring, caffeine, phosphoric acid, traces of coca and cola and eight other ingredients which may include cinnamon, nutmeg, vanilla, lavender, lime juice, various citrus oils and glycerine.

The average teen drinks 22 ounces of soda a day according to a survey in the February, 1981 Food Technology magazine. From 1960-1976, soft drink consumption in the U.S. increased 157%. Per capita consumption is more than one third higher than milk and nearly six times that of fruit juices. As far back as 1971, soda surpassed coffee as America's most popular drink. In 1980 the national average was 410 twelve ounce servings a year, up from 128 in 1960. That's about 40 gallons a year or thirteen ounces a day per person.

Soda now provides about 8% of the calories consumed daily by the average person; and nearly all of those come from sugar. Soft drinks account for about one-fourth of our refined sugar consumption. Insofar as soft drinks replace drinking water, milk and fruit juices, they can lead to imbalances in your diet. And statistics show that such replacement is very, very common. Twelve ounces of Coke contain 9.2 teaspoons of sugar. Sugar accounts for 99% of the 144 calories in a can of cola, and the figures are similar for other brands of cola and flavored carbonated drinks.

The Senate Committee on Nutrition and Human Needs recommended cutting refined sugar down to only about 10% of our caloric intake. The committee said, "total elimination of soft drinks from the diet, for many people, would lead to at least half the recommended reduction of consumption of sugars."

Dangers
In the 1970's and early 80's the non-sugar sweetener used by the beverage industry has been saccharin. Americans alone use seven million pounds of the sugar substitute yearly and three-fourths of that is consumed in soft drinks. But in the early 1970's, saccharin was shown in experiments to be a possible contributor to cancer. It was banned in 1977 in Canada. In the United States, products which contained saccharin contained this warning, . . . "Use of this product may be hazardous to your health. This product contains saccharin which has been determined to cause cancer in laboratory animals." But the warning has not slowed the sales of diet drinks. Further studies have clouded the issue. As it stands now, there is no positive proof, in the scientific sense, that saccharin causes cancer; but there are many experiments which suggest a link.

One ingredient not in Pepsi-Cola, but found in some orange sodas and Fresca is brominated vegetable oil. Canadian studies have shown that this additive can cause damage to animals and the FDA has removed it from the "generally recognized as safe" list of additives. For now, brominated vegetable oil is best avoided until further studies confirm its safety.

Soft drinks are best placed on your personal "controlled substance" list. They cannot become a water replacement or a need satisfied by three to eight bottles a day without having some harm to your health and diet. -75- The Learning Seed
It's hard to doubt the leading role soft drinks have played in reshaping the American diet over the past two decades. Consider these figures:

- The average man, woman, and child in the United States drank 410 12-ounce soft drinks last year—up from 128 in 1960. That's equivalent to nearly 40 gallons per person, or an average of 13 ounces a day.

- In 1971, sodas surpassed coffee as America's most popular drink. With a sales curve that looks like the trajectory of a Minuteman missile, soft drinks continue to steal a larger share of the beverage market. By 1979, they accounted for over a third of the U.S. beverage dollar. Alcoholic beverages and milk each held while coffee's slice of the pie declined to steady about about one quarter shares, about 20 percent.

In 1849, a single food source, soda pop, now provides about eight percent of the calories consumed daily by the average person. Virtually all those calories come from our leading food additive—sugar. Sodas account for roughly 25 percent of our refined sugar consumption, the largest contributor among all food groups.

These impressive statistics cap a phenomenal corporate success story. In 1879, people all over the world bought 21 billion gallons of products that originated as obscure patent medicines in the Civil War-ravaged South. When John Stith Pemberton, a druggist and former Confederate soldier, first added an extract from the African kola nut to an extract from coca, he had no idea that his "brain tonic" would push sales for the Coca-Cola Company to $5.9 billion a century later.

Nor could Pemberton have envisioned the nutrition and health impacts of his elixir on contemporaries and generations yet unborn. Soda industry advertising has taught us to "come alive" with a can of Pepsi, or reach for the "real thing" with a carton of Coke. In one sense the soft drink explosion is just an updated version of the old "snake oil" swindle, but the high consumption of these essentially superfluous beverages is far from benign.

Coke, Pepsi and their competitors are distorting the American diet in ways that pose a threat to public health. The litany of concerns expressed by the nutrition community includes:

- the high sugar content of soda pop:
- the use of caffeine, a mild stimulant, in beverages consumed by children:
- the slew of additives found in most drinks, some of which may be dangerous:
- the poor nutrition habits that soft drinks promote. Nutrition advocates worry that sodas replace more valuable foods in many diets.

Several of these points are worth examining more closely.

Sugar, Sugar and More Sugar

How many people realize that a 12-ounce can of Coke contains 9.2 teaspoons of sugar? Would anyone sprinkle that amount of this controversial white crystal over a bowl of cereal or dissolve it into a tall glass of iced tea?

Due to the presence of water—the largest ingredient in soft drinks—sugar amounts to only 10 percent of the content by weight. But a more relevant statistic is the number of calories contributed by any particular ingredient. Sugar accounts for 99 percent of the 144 calories in a can of Coke.

Today, 65 percent of the refined sugar consumed by Americans is delivered through the products of food and beverage manufacturers. Only 24 percent of our dietary sugar is added in the kitchen. This reverses the prevailing situation of 50 years ago.

It stands to reason that people have less control over the amount of a substance they consume when it is "pre-loaded" in foods. Hershel Horowitz of the National Institute for Dental Research thinks that the frequency of sugar consumption is more of a problem than the total amount consumed.

"Sugar is ubiquitous in pre-packaged foods," he said. "Every food containing sugar creates yet another acid bath in the mouth that helps promote tooth decay."

In 1979, Americans spent $10 billion on dental care. It's a sure bet that a large percentage of those dollars filled cavities in teeth. The largest single source of dietary sugar—soft drinks—must shoulder some of the blame.

But Jay Smith, a spokesman for the National Soft Drink Association, doesn't accept the charge willingly. He draws the distinction between liquid sources of sugar and highly-sugared solid foods that naturally stick to the teeth. He contends that fruits like figs or prunes have a greater decay-producing potential than soda pop.
The soft drink trade association takes the position that sodas are "strictly for refreshment"—that the addition of more of soda pop—the average per capita daily consumption—would not unbalance an already balanced diet.

It may be of little comfort to the parent of the teen-age boy who drinks cola; his average daily consumption—22 ounces according to a February survey in Food Technology magazine—may be of little comfort to the parent of the teen-age boy who drinks cola; his average daily consumption—22 ounces according to a February survey in Food Technology magazine—may be of little comfort to the parent of the teen-age boy who drinks cola; his average daily consumption—22 ounces according to a February survey in Food Technology magazine—may be of little comfort to the parent of the teen-age boy who drinks cola; his average daily consumption—22 ounces according to a February survey in Food Technology magazine—may be of little comfort to the parent of the teen-age boy who drinks cola; his average daily consumption—22 ounces according to a February survey in Food Technology magazine—may be of little comfort to the parent of the teen-age boy who drinks cola; his average daily consumption—22 ounces according to a February survey in Food Technology magazine—may be of little comfort to the parent of the teen-age boy who drinks cola; his average daily consumption—22 ounces according to a February survey in Food Technology magazine—may be of little comfort to the parent of the teen-age boy who drinks cola; his average daily consumption—22 ounces according to a February survey in Food Technology magazine—may be of little comfort to the parent of the teen-age boy who drinks cola; his average daily consumption—22 ounces according to a February survey in Food Technology magazine—may be of little comfort to the parent of the teen-age boy who drinks cola; his average daily consumption—22 ounces according to a February survey in Food Technology magazine—may be of little comfort to the parent of the teen-age boy who drinks cola; his average daily consumption—22 ounces according to a February survey in Food Technology magazine—may be of little comfort to the parent of the teen-age boy who drinks cola; his average daily consumption—22 ounces according to a February survey in Food Technology magazine—may be of little comfort to the parent of the teen-age boy who drinks cola; his average daily consumption—22 ounces according to a February survey in Food Technology magazine—may be of little comfort to the parent of the teen-age boy who drinks cola; his average daily consumption—22 ounces according to a February survey in Food Technology magazine.

Other than dental caries, sugar also is linked to several other degenerative diseases. In a letter to the Department of Health and Human Services, the Center for Science in the Public Interest noted that research that suggests sugar is tied to nutrient deficiencies, obesity, heart disease, high blood pressure, and behavioral disorders. (Nutrition Action, 1981) CSPN asked the government to reevaluate the "generally recognized as safe" (GRAS) status of the food additive.

"Kicking Your Kicks with Caffeine"

In 1986, the federal government called for the removal of cocaine from the list of GRAS food additives. In 1990, the Food and Drug Administration (FDA) is proposing to remove caffeine from the list of GRAS food additives, and assign it an "interim" status. That step would mean removing caffeine from the market as an additive, but start a series of tests to further evaluate the health impact of the substance.

By Greg Moyer and Mark Mayell

Soft Drink Consumption in the U.S.

(By 8-oz. servings per person per year)
The Caffeine Problem

Caffeine is quite possibly the oldest and most universal mind altering drug. Centuries ago, coffeehouses were banned in many countries and coffee was treated much as many illegal drugs are today.

Caffeine is a powerful central nervous system stimulant. The drug increases the flow of thought, and fights fatigue.

It stimulates the heart to beat faster and dilates or opens arteries to increase blood flow. Urine production is increased as is the secretion of hydrochloric acid in the stomach.

A dose of about ten grams can be fatal, but no deaths are known to have been caused by caffeine. Regular use produces dependence on caffeine and those so habituated become irritable when their drug is withdrawn and suffer from other withdrawal symptoms.

A kola nut does contain caffeine, but that accounts for only about five per cent of the caffeine found in cola drinks. Manufacturers add caffeine to soft drinks.

Industry spokespeople claim the caffeine is added to influence flavor, but many feel it is added mainly because of its drug effect—soft drinks with caffeine are very mild stimulants—a pick-me-up.

Many coffee drinkers have recognized the problems of caffeine over-use and have switched to decaffeinated coffee. Ironically, much of the caffeine taken out of coffee is purchased by the soft-drink industry and added to soda. This means that adults, in their desire to drink less caffeine are, in effect, selling their previous caffeine doses to soda drinkers—many of whom are children. And since children weigh less than adults, less caffeine is needed to produce its stimulant effects. It’s almost as if the effect of one soda on a 100 pound person is the same as the effect of two sodas on a 200 pound adult.

What is often called "coffee nerves" is really a form of caffeine addiction. Its symptoms include restlessness and disturbed sleep, diarrhea, upset stomach and heart palpitations. One problem is that children can develop these "coffee nerves" from too many soft drinks and chances are it will never be recognized as such.

Not much is known about the effects of caffeine on children, but some studies do suggest that kids who regularly drink a few soft drinks a day can fall victim to caffeineism.

Caffeine is a controversial drug. It might play a role in the development of ulcers, and at least one study found an increase in pancreatic cancer among coffee drinkers. But other studies have found no link between cancer and caffeine.

The Food and Drug Administration has warned pregnant women that caffeine can cause birth defects in animals. But definitive tests on the effects of caffeine are still under way.

Common sources of caffeine:

- NoDoz and Vivarin (per tablet) .................................................. 200 mg.
- Dexatrim & Dietac ................................................................. 200
- Excedrin ................................................................. 125
- 6 oz. cup of coffee ............................................................... 75-100
  (drip coffee provides more caffeine, percolated gives somewhat less, and regular instant coffee has only about half as much caffeine as non-instant)
- Baking chocolate (2 oz.) ................................................. 70
- Anacin ................................................................ 64
- Mountain Dew/Mello Yello/Diet Mr. Pibb .......... 51
- 6 oz. of tea ................................................................. 20-50
  (the longer the tea is brewed the more caffeine will be in the drink)
- Most other cola-drinks ......................................................... 33-43
- Coca-Cola (12 oz.) ............................................................. 34
- Chocolate bar (2 oz.) .......................................................... 12
- Cocoa drink ................................................................. 10

(The following have no caffeine: 7-Up, Sprite, Snapple, Craigmont Cola, Fanta Orange, Fresca, Hires and various cola-free and decaffeinated soft drinks)
# Top ten soft drinks

<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>7-Up</td>
<td>1.563</td>
<td>24.2%</td>
</tr>
<tr>
<td>Pepsi</td>
<td>1.104</td>
<td>16.3%</td>
</tr>
<tr>
<td>Orange Crush</td>
<td>926</td>
<td>5.4%</td>
</tr>
<tr>
<td>7-Up</td>
<td>201</td>
<td>5.0%</td>
</tr>
<tr>
<td>Tab</td>
<td>215</td>
<td>3.6%</td>
</tr>
<tr>
<td>Mtn Dew</td>
<td>179</td>
<td>2.9%</td>
</tr>
<tr>
<td>Sprite</td>
<td>178</td>
<td>2.9%</td>
</tr>
<tr>
<td>Diet Pepsi</td>
<td>173</td>
<td>2.9%</td>
</tr>
<tr>
<td>RC Cola</td>
<td>154</td>
<td>2.7%</td>
</tr>
<tr>
<td>Sunkist</td>
<td>82</td>
<td>1.4%</td>
</tr>
</tbody>
</table>

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### Advertisement

**Hires’ Improved Root Beer**

Package 25 Cents

Make Free Samples of this most delicious and wholesome Temperance Drink in the style of FRY IT. Ask your Dealer or Grocer for it. If they should not have it, send 25 cents and we will send you a package by mail.


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UNIT 6

THE CASE AGAINST A JUNK FOOD JUNKIE

LESSON PLAN

THE BALLAD OF THE JUNK FOOD JUNKIE

SUGAR IN READY-TO-EAT BREAKFAST CEREALS
EXPLANATION

SUGAR CONTENT OF COMMERCIALLY AVAILABLE
BREAKFAST CEREALS

TRANSPARENCIES - THE AVERAGE AMERICAN EATS
POPS, etc.

CAFFEINE
20 POUNDS OF CANDY
6 POUNDS OF POTATO CHIPS
25 POUNDS OF ICE CREAM

JUNK FOOD JUNKIES EAT THEIR LIFE AWAY QUIZ

THE CASE AGAINST A JUNK FOOD JUNKIE

EVALUATION OF A JUNK FOOD AD

YOU CAN'T LIVE WITHOUT IT
UNIT 6

THE CASE AGAINST A JUNK FOOD JUNKIE

Generalizations:

1. Factors that contribute to the poor eating patterns of teenagers are: 1) establishment of identity; 2) life-style of snacking and dieting; 3) peer pressure.

2. Excessive amounts of high calorie snacks may contribute to a person's overweight condition.

3. People are influenced by mass media advertising. Television, radio, newspaper and advertisements have a great influence on a person's choice of food.

Objectives

The student will be able to:

1. Analyze ingredients of popular snack food items.
2. Identify packaging and advertising promotions that encourage the buying of snack foods high in sugars, salt, and fat.
3. Evaluate advertisements selling foods high in sugar and calories and low in nutritional value.

Activities

Teachers may use the following activities to help students achieve the objective.

1. Play the record "Junk Food Junkie" or a similar record and discuss what foods might be labeled junk food. (e.g. Foods that are high in calories but contribute little or no nutrients to the diet). See lyrics to "A Ballad of the Junk Food Junkie" attached.

2. Prepare a display using test tubes of sugar in various foods (use 1 teaspoon = 1 gram) using "Sugar Content of Commercially Available Breakfast Cereals," attached. Discuss hidden sugars.

3. Show transparencies "The Average American Consumes" and discuss some of the food items Americans consume in large quantities. Discuss nutritional contributions these foods make to the diet. (Cover up amounts and let students predict before giving answers.)

4. Give students the Junk Food Junkies Eat Their Life Away Quiz. Discuss answers.

5. Teacher provide or students bring to class a food that would fit the definition of a junk food. Students fill out questionnaire "A Case Against A Junk Food Junkie" using their products.
6. Using magazine ads for selected food items, have students evaluate advertisements using the student worksheet "Evaluation of a Junk Food Ad."

7. Observe children's T.V. programs. See how food products are advertised for a young audience. Ads aimed at children can be video-taped and watched in class, discussed and evaluated.

Materials:

Record- The Junk Food Junkie
"Sugar content of Commercially Available Breakfast Cereals" handout for each student.
Test tubes and sugar.
Transparencies - "The Average American Consumes".
Quiz - The Junk Food Junkies Eat Their Life Away Quiz.
One junk food product per group and questionnaire- "A Case Against A Junk Food Junkie"
Video-cassette of commercials aimed at children.
VCR and monitor.
"You Can't Live Without It" sheet, 1 for each group.

Evaluation:

1. Small Group Activity--Give each group of students a particular "junk food." Have each group prepare an advertisement that might sell the product using the information from "The Case Against A Junk Food Junkie" form. Students use the activity sheet "You Can't Live Without It," to summarize the activity. Each group will give a one minute oral presentation of their prepared advertisement. Students assess what they have learned as a result of this activity.

2. At some time (several weeks) later in the same class stage a contest with prizes. Winners can choose from a selection of junk foods and nutritious snacks. Observe which is chosen.

Adapted from a teaching module by Sue Blass, Valhalla High School, Grossmont Union High School District, La Mesa, CA.
(The Ballad of the)

Junk Food Junkie

Well, you know I love that organic cookin'
I always ask for more.
And they call me Mister Natural
On down to the healthfood store,
I only eat good sea salt—
White sugar don't touch my lips
And my friends is always beggin' me
To take 'em on macrobiotic trips.
But at night I take out my strong box
That I keep under lock and key,
And I take it off to my closet
Where nobody else can see.
I open that door so slowly
Take a peek up North and South,
And I pull out a hostess Twinkie
I pop it in my mouth.

CHORUS
In the daytime I'm Mister Natural
Just as healthy as I can be.
But at night I'm a JUNK FOOD JUNKIE,
Good Lord, have pity on me.

My friends down at the commune
They think I'm pretty neat,
I don't know nothing 'bout arts and crafts
But I give 'em all something to eat.
I'm a friend to old Euell Gibbons,
And I only eat home grown spice,
I got a John Keats autograph
Filled up with my brown rice.
Oh, but lately I have been spotted
With a Big Mac on my breath
Stumblin' into a Colonel Sanders
With a face as white as death.
I'm afraid some day they'll find me
Just stretched out on my bed
With a handful of Pringle's potato chips
And a Ding-Dong by my head.

CHORUS
In the daytime I'm Mister Natural
Just as healthy as I can be.
But at night I'm a JUNK FOOD JUNKIE,
Good Lord, have pity on me.
The Nutrient Composition Laboratory of the Nutrition Institute in the Human Nutrition Center, USDA, has a scientific paper which details extensive work on its analysis of sugars in ready-to-eat breakfast cereals.

Controversies around ready-to-eat breakfast cereals have centered not on the cereal portion but rather on the added sugars. Since the generic name "sugar" generally refers to sucrose which has been the one sugar singled out for criticism about its possible detrimental effects on dental health and other health areas, cereal producers have begun to use other sugars for sweetening and other purposes. Analytical data from the USDA includes calculations for total sucrose, fructose, lactose, and maltose.

Fructose and glucose are present in limited amounts in only two products of the 62 products analyzed from six manufacturers. Both of these products were labeled "Raisin Bran".

Lactose and maltose, "not detectable" in most of the products, were low in all others except 5% maltose for Grape Nuts and Grape Nuts Flakes.

The level of sucrose varied the most for these products, being "not detectable" in one sample, to as high as 70.8% in another product. The average "total sugar" content for the 62 products is presented in the following table. Most manufacturers offer products across the entire range of products.

Source: Highlights in Home Economics, Cooperative Extension University of California, February, 1980.
## SUGAR CONTENT OF COMMERCIALLY AVAILABLE BREAKFAST CEREALS

<table>
<thead>
<tr>
<th>COMMERCIAL CEREAL PRODUCT</th>
<th>SUGAR CONTENT (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shredded Wheat (Large Biscuit)</td>
<td>1.2</td>
</tr>
<tr>
<td>Shredded Wheat (Spoonsize Biscuit)</td>
<td>1.6</td>
</tr>
<tr>
<td>Cheerios</td>
<td>2.7</td>
</tr>
<tr>
<td>Puffed Rice</td>
<td>2.8</td>
</tr>
<tr>
<td>Wheat Chex</td>
<td>3.5</td>
</tr>
<tr>
<td>Uncle Sam Cereal</td>
<td>3.6</td>
</tr>
<tr>
<td>Grape Nut Flakes</td>
<td>3.9</td>
</tr>
<tr>
<td>Puffed Wheat</td>
<td>4.2</td>
</tr>
<tr>
<td>Special K</td>
<td>4.8</td>
</tr>
<tr>
<td>Post Toasties</td>
<td>5.8</td>
</tr>
<tr>
<td>Product 19</td>
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</tr>
<tr>
<td>Corn Total</td>
<td>5.8</td>
</tr>
<tr>
<td>Peanut Nut Butter</td>
<td>6.3</td>
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<tr>
<td>Corn Flakes (Kroger)</td>
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<tr>
<td>Grape Nuts</td>
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<tr>
<td>Corn Flakes (Kellogg)</td>
<td>8.2</td>
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<tr>
<td>Corn Check</td>
<td>8.4</td>
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<tr>
<td>Alpen</td>
<td>8.5</td>
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<tr>
<td>Crispy Rice</td>
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<tr>
<td>Wheaties</td>
<td>8.9</td>
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<tr>
<td>Corn Flakes (Food Club)</td>
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<tr>
<td>Total</td>
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<tr>
<td>Rice Chex</td>
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<tr>
<td>Crisp Rice</td>
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<tr>
<td>Concentrate</td>
<td>12.3</td>
</tr>
<tr>
<td>Rice Crispies (Kellogg)</td>
<td>12.9</td>
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<tr>
<td>Buck Wheat</td>
<td>15.1</td>
</tr>
<tr>
<td>Brown Sugar Cinnamon Frosted Mini Wheats</td>
<td>16.3</td>
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<tr>
<td>Life</td>
<td>17.0</td>
</tr>
<tr>
<td>Granola</td>
<td>17.2</td>
</tr>
<tr>
<td>Team</td>
<td>17.0</td>
</tr>
<tr>
<td>Sugar Frosted Corn Flakes</td>
<td>17.4</td>
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<tr>
<td>Granola (with dates)</td>
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<tr>
<td>40% Bran Flakes (Post)</td>
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<td>Raisin Bran (Skinner)</td>
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<tr>
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<tr>
<td>All Bran</td>
<td>21.6</td>
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<tr>
<td>Granola (with almonds &amp; filberts)</td>
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<td>Fortified Oat Flakes</td>
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<tr>
<td>Raisin Bran (Kellogg)</td>
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<tr>
<td>Super Sugar’Chex</td>
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<tr>
<td>COMMERCIAL CEREAL PRODUCT</td>
<td>SUGAR CONTENT (%)</td>
</tr>
<tr>
<td>--------------------------------------------------------</td>
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<tr>
<td>Heartland</td>
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<td>Sugar Frosted Flakes</td>
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<tr>
<td>Bran Buds</td>
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<tr>
<td>Sugar Sparkled Corn Flakes</td>
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<tr>
<td>Frosted Mini Wheats</td>
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<tr>
<td>Sugar Pops</td>
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<td>Alpha Bits</td>
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<tr>
<td>Sir Grapefellow</td>
<td>43.8</td>
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<tr>
<td>Cap'n Crunch</td>
<td>44.4</td>
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<tr>
<td>Crunch Berries</td>
<td>44.4</td>
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<tr>
<td>Super Sugar Crisp</td>
<td>45.2</td>
</tr>
<tr>
<td>Orange Quangarooos</td>
<td>45.3</td>
</tr>
<tr>
<td>Quisp</td>
<td>45.5</td>
</tr>
<tr>
<td>Cocoa Puffs</td>
<td>46.5</td>
</tr>
<tr>
<td>Vanilly Crunch</td>
<td>46.5</td>
</tr>
<tr>
<td>Frankenberry</td>
<td>46.6</td>
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<tr>
<td>Frosted Flakes</td>
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<tr>
<td>Cocoa Krispies</td>
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<tr>
<td>Kaboom</td>
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<tr>
<td>Baron Von Redberry</td>
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<tr>
<td>Count Chocula</td>
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<tr>
<td>Froot Loops</td>
<td>47.9</td>
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<tr>
<td>Boo Berry</td>
<td>48.5</td>
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<tr>
<td>Pink Panther</td>
<td>48.5</td>
</tr>
<tr>
<td>Honeycomb</td>
<td>50.5</td>
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<tr>
<td>Cinnamon Crunch</td>
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<tr>
<td>Cocoa Pebbles</td>
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</tr>
<tr>
<td>Apple Jacks</td>
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<tr>
<td>Fruity Pebbles</td>
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<tr>
<td>King Vitamin</td>
<td>61.6</td>
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<tr>
<td>Sugar Smacks</td>
<td>63.7</td>
</tr>
<tr>
<td>Super Orange Crisp</td>
<td>70.8</td>
</tr>
</tbody>
</table>

20 POUNDS OF CANDY
200 STICKS OF GUM

OVERLY 272 FOR "THE AVERAGE AMERICAN..."
300 CANS OF SODA
6 POUNDS OF POTATO CHIPS
25 GALLONS OF ICE CREAM
130 POUNDS OF SUGAR

OPEN 24 HRS

SODA

ICE CREAM

OVERLAY #3 FOR "THE AVERAGE AMERICAN..."
JUNK FOOD JUNKIES EAT THEIR LIFE AWAY QUIZ

1. How many 12 oz. cans of soft drinks does the average American drink each year?
   a. 86   
   b. 300   
   c. 220

2. If in one day's time an individual had eaten the following—a bowl of sugar coated cereal, a fast food shake, and a candy bar—approximately how many teaspoons of sugar would have been consumed?
   a. 12 tsp. sugar   
   b. 27 tsp. sugar   
   c. 31 tsp sugar

3. The average American each year consumes approximately:
   a. 50 lbs. sugar   
   b. 75 lbs. sugar   
   c. 130 lbs. sugar

4. A fast food "shake" is so named because it contains primarily:
   a. ice cream   
   b. milk   
   c. gelatin, air, sugar and milk products

5. The average person needs between 250 to 500 mg of sodium a day. The sodium content in low calorie cola is approximately:
   a. 29 mg   
   b. 10 mg   
   c. 75 mg

6. Each year the American public consumes a great deal of caffeine. The beverage containing caffeine which was consumed in the greatest quantity was:
   a. cola   
   b. coffee   
   c. tea

7. The three leading health problems of teenagers today are:
   a. dental caries   
   b. obesity   
   c. drug abuse

8. True or False—the consumption of junk foods is replacing nutritious foods in the diets of teenagers.

9. True or False—junk foods are often high in salt, sugar, caffeine, fats and calories.

10. True or False—Advertising techniques used to sell junk foods are based on facts other than high nutrition, savings of money, and general well-being to the consumer.

Answers:
1. b. 2. a. 3. c. 4. c. 5. a. 6. b.

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THE CASE AGAINST A JUNK FOOD JUNKIE

1. Name of product: ____________________________

2. Complete the chart:

<table>
<thead>
<tr>
<th>wt.</th>
<th>cost</th>
<th>cost per ounce</th>
<th>no. of servings</th>
<th>cost per serving</th>
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</table>

3. What are the ingredients in your food?

   ____________________________________________
   ____________________________________________
   ____________________________________________
   ____________________________________________

4. Is sugar, salt, or fat the number one ingredient? Name.

   ____________________________________________

5. Is there more than one kind of sweetener in your product? Name.

   ____________________________________________

6. Are there any additives in your product? Name them and write in the purpose:

   ____________________________________________
   ____________________________________________
   ____________________________________________
   ____________________________________________

7. What ingredients do you recognize that are "natural" (carrots, milk, etc.).

   ____________________________________________

8. What nutritional contributions does this food make to your well-being?

   ____________________________________________

9. What kind of packaging is used on this product? Is there anything about the packaging that might encourage you to spend your money for this product?

   ____________________________________________
10. Have you seen this product advertised in any newspapers, magazines, or on T.V.? Where?

11. Do you think a large amount of money is spent on the packaging and advertising of this product? Why?

12. Eat this food and rate it for:

- Taste: bad ok good fine super
- Eye Appeal: bad ok good fine super
- Satisfaction in eating: bad ok good fine super
- Nutritional contributions: bad ok good fine super
- Cost for what you get: bad ok good fine super

13. How many empty calories do you consume in one serving?

14. Why might you purchase this food?

15. Why do you think the supermarkets stock this item?

16. Why do you think the manufacturers continue to make this product?

17. List the positive and negative things you have learned about your product from this investigation.

<table>
<thead>
<tr>
<th>Positive</th>
<th>Negative</th>
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<tbody>
<tr>
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</tbody>
</table>
**THE CASE AGAINST A JUNK FOOD JUNKIE**

**EVALUATION OF A JUNK FOOD AD**

Place a check mark in the space describing your feelings about information presented in the advertisement for a junk food.

**Name of product advertised**

<table>
<thead>
<tr>
<th>Feature</th>
<th>GOOD</th>
<th>BAD</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nutritious</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inexpensive</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low Calorie</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Additive Free</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overall Health Appeal</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Taste Satisfaction</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ad Colorful, Eyecatching</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Free Give Away</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Catchy Name</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Directed at a Single Age Group</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Colorful Packaging</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Catchy Ad</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Misleading Information</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Use of Words That Have No Clear Meaning</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In your opinion why do students buy and consume a junk food?

How does advertising influence you to buy junk food?

---

-95-
"You Can't Live Without It"

1. Using the data your group has gathered in "The Case Against A Junk Food Junkie", prepare a one-minute presentation selling your product to the class. The person who makes the presentation will receive a bonus of ten points. Be sure to use the wrapper from your product in the presentation.

Evaluation: What have you learned from this class assignment about food sales and products?
UNIT 7

NUTRIENT DENSITY

Lesson Plan
Nutrient Density
Calculating Nutrient Density
Calculating the Nutrient Density of Foods Worksheet
UNIT 7

NUTRIENT DENSITY

Generalizations:

1. Nutrient density refers to the relative proportion of nutrients to calories in a food.

Objectives:

The student will be able to:

1. Define nutrient density.
2. Compute the nutrient density for various foods.
3. Classify foods according to their nutrient density.
4. Identify snack items with a high nutrient density.
5. Evaluate the nutritional value of various foods.

Suggested Activities

1. Discuss nutrient density as a means of measuring the nutritional value of various foods.
2. Examine and discuss the comparison cards from the Dairy Council.
3. Students will examine labels which have nutritional information provided. Using the formula provided in the handout, determine the nutrient density of five to ten products.
4. Students will arrange their food products with its computed nutrient around the room in order of most nutritious to least nutritious. Discuss the arrangement of foods the class has prepared. Discuss generalizations that can be applied to the arrangement of the foods.

Evaluation:

Compilation of nutrient density of foods.
Class participation and discussion.

Resources

Food labels.
Comparison Cards of Various Foods from California Dairy Council
"Calculating Nutrient Density" from Today's Homemaker
by Dorothy Wenck, Agricultural Extension Service
NEWS ITEM: A major snack food manufacturer is concerned about a growing trend among American consumers to switch from so-called "junk" foods to more "natural" foods and is launching a campaign to improve the nutritional image of its products.

Will you be persuaded by advertisements and labels that tout the nutritional value of certain snack foods? What standard will you use to judge the validity of information presented to you?

One standard you might consider using as a basis for comparing the nutritional value of foods is NUTRIENT DENSITY.

T IS NUTRIENT DENSITY?

Nutrient density refers to the relative proportion of nutrients to calories in a food. To determine nutrient density you look at: (1) the number of calories and (2) the amount of other nutrients, particularly minerals and vitamins.

Thus, a food relatively low in nutrients and high in calories has low nutrient density, while a food relatively high in nutrients compared to calories has high nutrient density.

High Nutrient Density Foods Are:

- Low in calories
- Low in fats and/or sugars
- High in vitamins, minerals, and/or protein
- May be high in fiber and/or water
- Examples—vegetables, certain fruits, non-fat milk products, organ meats.

Low Nutrient Density Foods Are:

- High in calories
- Likely to be high in fats and/or sugars
- Low in nutrients, especially minerals, vitamins, and/or protein
- Examples—soft drinks, candy, corn and potato chips, cookies, desserts.

WHY IS NUTRIENT DENSITY IMPORTANT?

American eating patterns have been trending towards use of ever larger amounts of low nutrient density foods. Haphazard eating and shopping, where balanced meals are replaced by frequent snacking and food purchases are made on impulse without planning, may be reasons for this trend. Another reason may be the heavy advertising of low nutrient density snack foods on TV and elsewhere.

Nutritionists are concerned about this trend, especially among young children. The potential health hazards are obvious: (1) diets that are too high in calories—leading to excess weight gain; and (2) diets that are lacking in essential nutrients, especially minerals and vitamins. (A daily vitamin pill won't supply all the missing nutrients!)

But this is not to say that one should never eat low nutrient density foods. It's the quantity that's the key—and the individual's calorie needs. A physically active, rapidly growing teenage boy, with his enormous need for calories, can afford to eat more low nutrient density foods than a sedentary middle-aged or older person who must get high nutrient return for his/her calories. Low nutrient density foods are natural enemies of dieters!

You get good nutritional value when you "spend" your calories on a high nutrient density food—and you're likely to get your money's worth too. Conversely, low nutrient density foods are costly in terms of both calories and money. Two-way losers, you might say.

HOW CAN YOU DETERMINE NUTRIENT DENSITY?

Some foods have nutrition labels that tell you the number of calories, the amount of fat, protein, and carbohydrate, and the USRDA (U.S. Recommended Daily Allowances) of...
Calculating Nutrient Density

In this formula (developed by Dr. Stanley Winters of Golden West College), the score of 32% of USRDA per 100 calories is the dividing line between a good versus poor choice. The farther a food is from the score of 32, the better (high score) or poorer (low score) it is.

1. Add the total of USRDA's per serving that are listed on the label for the first eight nutrients—protein, vitamin A and C, thiamine, riboflavin, niacin, calcium, and iron.

2. Divide this total by the number of calories in that serving, and multiply the result by 100. (Dividing gives you the percent of USRDA's per calorie; multiplying by 100 gives it on the basis of 100 calories.)

Example: Baked Potato Potato Chips (10)

<table>
<thead>
<tr>
<th></th>
<th>Baked Potato</th>
<th>Potato Chips</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calories</td>
<td>150</td>
<td>110</td>
</tr>
<tr>
<td>Protein</td>
<td>6% USRDA</td>
<td>2% USRDA</td>
</tr>
<tr>
<td>Vitamin A</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Vitamin C</td>
<td>50</td>
<td>4</td>
</tr>
<tr>
<td>Thiamine</td>
<td>10</td>
<td>2</td>
</tr>
<tr>
<td>Riboflavin</td>
<td>4</td>
<td>-</td>
</tr>
<tr>
<td>Niacin</td>
<td>15</td>
<td>4</td>
</tr>
<tr>
<td>Calcium</td>
<td>2</td>
<td>-</td>
</tr>
<tr>
<td>Iron</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>93% USRDA</td>
<td>14% USRDA</td>
</tr>
</tbody>
</table>

Divide 93 by 150 = .45 14 divided by 110 = .13
Multiply .45 x 100 = 45 .13 x 100 = 13

Conclusion: the nutrient density score of plain potato (45) is almost three times that of potato chips (13). The reason for the difference is the high fat content of chips. If 1 T butter or margarine is used on potato the score is 34; with 1 T sour cream the score is 38.

Caution: Don't use this method on heavily enriched or fortified foods such as breakfast cereals. The enrichment nutrients give relatively high percents of USRDA's but are not true indicators of other trace nutrients not added in the enrichment process.

Nutrient density is not the only factor to consider when choosing a food. You also may be concerned about the amounts of fiber and of salt or sodium and the kind of fat (saturated or polyunsaturated). And keep in mind that the best nutrition advice is to choose a wide variety of foods from all the foods groups and to eat them in moderation.
CALCULATING THE NUTRIENT DENSITY OF FOODS

<table>
<thead>
<tr>
<th>Name of food</th>
<th>Calories</th>
<th>Protein</th>
<th>Vitamin A</th>
<th>Vitamin C</th>
<th>Thiamine</th>
<th>Riboflavin</th>
<th>Niacin</th>
<th>Calcium</th>
<th>Iron</th>
<th>Total</th>
</tr>
</thead>
</table>

Divide total % USRDA by total calories = equals

Last total x 100 = N.D.
UNIT 8

MEALS IN MINUTES

Lesson Plan

Study Guide - Eating on the Run
MEALS IN MINUTES

Generalizations:

1. Eating well balanced breakfasts, lunches and snacks provide the nutrients necessary for good health.

2. A person can be properly nourished even when eating in a hurry.

Objectives

The student will be able to:

1. Identify the basic four food groups, the number of servings needed by a teenager daily, and classify foods according to the group to which they belong.
2. Discuss why eating nourishing meals and snacks is important.
3. Give examples of quickly made, nutritious breakfasts.
4. Recommended ways lunches can be improved when eating out.
5. List healthful snacks.
6. Explain why healthful snacks are better than empty calorie snacks.
7. Demonstrate a breakfast that can be made in five minutes or less.

Suggested Activities:

1. The teacher will explain the basic four food groups and classify foods that belong to each.
2. The teacher will introduce the film "Eating on the Run", and site research findings on the effects of skipping breakfast.
3. Hand out study guide and go over questions that students are to look for during the film.
4. Students will view the film and complete study guide individually.
5. Teacher will lead a discussion using the questions from the guide.
6. Students will get into groups of 3-4 persons each. Each group will decide on a breakfast that can be prepared in five minutes or less. Group members will plan and present a demonstration of the nutritious breakfast that they have chosen.

Materials:

Film, "Eating On the Run"
Alfred Higgins Productions, Inc.
9100 Sunset Boulevard
Los Angeles, CA 90069
Study Guide for each student
Food for class demonstrations
Evaluation:

Completion of study guide.
Participation in demonstration and planning.
1. Name the 4 food groups.

2. Why is eating a nourishing breakfast important?

4. Give 3 examples of quickly made nutritious breakfasts that WERE NOT mentioned in the film.

5. How can we improve our lunches when eating out?


7. Explain why healthful snacks are better to choose to eat than empty calorie snacks such as candy, chips, and soft drinks.
UNIT 9

THE SUGAR FILM

Lesson Plan

Study Guide - The Sugar Film
The Sugar Film

Objectives:

After viewing the film the students will be able to:

1. Name the 3 major categories of foods.
2. Name the different kinds of sugars used by food manufacturers.
3. Identify the quantity of foods consumed by the average American.
4. Explain how sugar is used in the body.
5. Name some of the diseases that are associated with a high sugar consumption diet.
6. Classify sugar as a food, drug, or poison and explain their classification.

Activities:

1. The teacher will introduce the movie by telling the students what points to look for.
2. Go over the questions on the study guide so students will watch with these questions in mind.
3. Students will complete the study guide individually.
4. Teacher will lead a classroom discussion of the answers to the study guide.

Materials:

- Study guide for each student.
- Film - The Sugar Film
- and 16 mm projector

IMAGE ASSOCIATES
P.O. Box 40106
352 Conejo Road
Santa Barbara, Ca., 93103
(805) 962-6009

Evaluation:

- Completed study guide.
- Participation in class discussion.
Sugar is a major ingredient in most packaged and prepared foods, and Americans, on the average, eat 130 pounds of sugar a year. It is important that we understand what sugar is and how it affects us, both physically and mentally.

1. All foods fall into 3 major categories. What are they? 
   
   In which category is sugar?

2. What other common foods fall into the classification of carbohydrates?

3. Name the different kinds of sugars used by food manufactures.

4. How many ounces of sugar does the average American consume each day? Each year?

5. Explain the metabolism of sugar.

6. What happens when we don't have enough glucose in our blood stream?

7. What happens when we have too much glucose in our blood stream?

8. How can eating more sugar further decrease our blood glucose level?

9. Name some of the diseases that have been associated with a high sugar consumption diet.