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Nutrition, behavior, and learning

Anna Miller

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NUTRITION,
BEHAVIOR,
and
LEARNING

by
Anna Miller

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A RESEARCH PAPER
SUBMITTED IN PARTIAL FULFILLMENT OF THE
REQUIREMENTS FOR THE DEGREE OF
MASTER OF ARTS IN EDUCATION
(EDUCATION OF LEARNING DISABLED CHILDREN)
AT CARDINAL STRITCH COLLEGE
Milwaukee, Wisconsin

1977

This research paper has been
approved for the Graduate Committee
of Cardinal Stritch College by

Sister Jeanne Marie Kieckhafer
(Advisor)

Date Oct. 1, 1976

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CHAPTER I

INTRODUCTION

For generations children have been told, "Eat your carrots. They're good for your eyes", "Jello will make your fingernails strong", "Fish is brain food", and "An apple a day keeps the doctor away". Now some doctors are prescribing diets to change behavior. Can the food one eats actually influence behavior and intellectual functioning? Does poor or inappropriate nutrition have a relationship to learning? Do food additives cause a change in body chemistry and affect the central nervous system and brain functioning? Can learning disabilities result through altered biochemical processes due to inadequacies of existing nutritional programs?

Before one can answer these questions, the psychology of learning must be understood. Learning occurs through active, responsive involvement with stimulation from the environment. Each step children go through serves as a foundation for later learning. Neuropsychological development underlies and guides all areas of development.¹ According

¹Braga, Laurie and Joseph, Learning and Growing (New Jersey: Prentice-Hall, 1975), pp. 2-6.

to Piaget, true learning occurs as a result of development. Development explains learning.² There is increasing evidence that there are two kinds of intelligence, verbal and performance, and that each is controlled by a different side of the brain.³

When one accepts this theory that development explains learning, it follows that severe malnutrition has a definite effect on learning. This idea is generally accepted. According to Cravioto:

Theoretically, malnutrition could act either directly, by interfering with the development of the central nervous system or indirectly.

A lag in development of certain varieties of inter-sensory integrations thus appears to have a high correlation with the lag in the acquisition of still other educational skills.⁴

and Stern:

Malnutrition in early life retards the brain's functional development and its biochemical maturation.

Animal experiments show that cell formation, metabolic maturation, neuronal differentiation, and both innate and adaptive behavior patterns can be adversely affected in various ways by thyroid deficiency, etc.⁵

²Ginsburg, Herbert and Opper, Sylvia, Piaget's Theory of Intellectual Development: An Introduction (New Jersey: Prentice-Hall, 1969), pp. 176-186.

³Rosenthal, Joseph H. "Hazy? Crazy" and/or Lazy?" Academic Therapy (San Rafael, Calif, 1973):20.

⁴Cravioto, J. "Nutritional Deprivation and Psychological Development in Children," Children with Learning Problems (New York: Brenner/Mazel, 1973), pp. 218-240.

⁵Stern, J. "Biochemistry--Brain Development," Journal of Learning Disabilities (March 1974):148.

Is it then logical that inadequate or inappropriate nutrition has a similar effect on brain functioning, body development, and learning? That was the concern of this paper.

Purpose

This research paper was written as a review of the research and literature to date concerned with the relationship between nutrition, behavior, and learning. A secondary purpose was to discover how parents and teachers might systematically observe learning problems relating to nutrition, and thereby prevent or remediate these problems.

Method

The author used magazines, newspapers, journals, and books in searching for information. Because most of the research relating to nutrition, behavior, and learning was current, a letter was sent to each writer of an article or book requesting more complete information on that person's project. A sample of the letter appears in the appendix. Most people replied with copies of research reports or names of other people involved in similar work; therefore, the information in this paper is very timely.

Overview

Before one can determine the effect of nutrition on learning, one must have some knowledge of the psychology of learning; therefore this subject was included in Chapter I,

as were the effects of malnutrition on learning. Chapter II, dealing with research and literature on poor or inappropriate nutrition and its effects on learning, was divided into two parts: (1) the effects of poor or inappropriate nutrition on behavior and intellectual functioning, and (2) the effects of food additives on the human body and learning. The third chapter deals with how teachers and parents might discern nutritionally caused learning problems in order to prevent or remediate these learning problems.

Summary

Chapter I presented the purpose of this research paper as reviewing the current research and literature relating to nutrition, behavior, and learning. A secondary purpose of practical application of the results was also presented. A brief review of learning theory, using Piaget's theory that development is the basis for learning, was given. Severe malnutrition was briefly discussed, but not as an integral part of the problem being researched. This paper deals with the effects of poor or inappropriate nutrition on behavior and learning.

CHAPTER II

REVIEW OF LITERATURE

Introduction

This chapter deals with the research and literature available concerning poor or inappropriate nutrition, and its effects on learning. The first section had to do with the effects of inappropriate nutrition on behavior and intellectual functioning; the second section reviewed the literature dealing with the effects of food additives on the human body and learning.

Learning is concerned with all the behavioral changes resulting from experience.¹ Thus a person's total state of well-being depends upon his total environment and nutrition is an important component of that environment. Poor nutrition has been influenced by the overconsumption of sugar, use of convenience foods, and lack of nutritional knowledge by adults.²

¹DeCecco, John P. Learning in the School (New York: Holt, Rinehart, & Winston, 1964), p. 32.

²Hunt, James Lambert, The Food and Health of Western Man (New York: John Wiley and Sons, 1975), p. 57.

Because people are not all similar and do not interact in identical ways with their environment, it seems reasonable that some people will be more likely than others to develop nutritional problems.³ Given a similar diet, people in a group may react differently. The diet may be adequate for the majority, but will cause difficulties for a susceptible few.

Effects of Inappropriate Nutrition on Behavior and Intellectual Functioning

There is a relationship between nutrition and the ability to learn but it is difficult to study nutrition as an independent variable in humans. The child with an inappropriate diet may suffer from impaired growth and development, and illness. Because of this his attention and physical energy may be diverted from educational pursuits. Inadequate food intake may be one cause of improper nutrition; another may be that the required nutrients are not reaching cells, resulting in malnutrition at the secondary level. Causes for this may be (1) genetic defects, i.e. Phenylketonuria (PKU), (2) genetic vitamin dependency with abnormality in metabolic pathways--the body demands massive amounts of certain vitamins to function properly, (3) stress, and (4) malabsorption.⁴

³Gifft, H. H., Washbon, M. B., and Harrison, G. G., Nutrition, Behavior, and Change (New Jersey: Prentice-Hall, 1972), p. 132.

⁴Jani, S. N. and Jani, L. A. "Nutritional Deprivation and Learning Disabilities--An Appraisal," Academic Therapy 10 (Winter 1974-1975):151-157.

An increasing number of congenital diseases are being discovered in which dietary constituents--notably amino acids--are not utilized properly by the body. PKU is an example of one of these which can be controlled by the use of a restrictive diet. In PKU and other similar diseases, abnormal products are accumulating in the body and causing damage. This damage is especially seen in the brain of the young child.⁵

Watson believes that much unacceptable behavior is the result of an exhausted nervous system, an under-nourished brain, an obscure allergy, an absurd reducing diet, an imperfectly functioning body or any of a host of other physical problems. The brain and nervous system are almost totally dependent on glucose for normal functioning. What a person eats, digests, and assimilates provides the energy-producing nutrients that the bloodstream takes to the brain. Functioning is impaired if there is any interference in this chain of events. Eating the proper foods to provide a constant supply of glucose for the blood is a complicated task. The blood-sugar level is maintained by the proper balance of carbohydrates and proteins and is indirectly influenced by the amount of fat being burned in the tissues. This process is unique in each person. Allergic reactions

⁵Munro, H. N., "Impact of Nutritional Research on Human Health and Survival," Chapter 1 in The Nutrition Crisis, ed. by T. P. Labuza (St. Paul: West Publishing, 1975).

may disrupt every system in the body. There has been little research by scientists dealing with the possibility that some abnormal mental and emotional reactions are allergic in origin because it is almost impossible to establish a cause-effect relationship between an offending substance and the reaction. People who appear to be similar react differently. If a person is not physically ill and is having behavioral or learning problems, one might suspect and look for causes in four general areas: (1) inadequate nutrition; (2) chemical interference with the ability of the tissues to function normally; (3) stress; and, (4) failure to repair tissue because of lack of sufficient sleep.⁶

George von Hilsheimer of the Green Valley School in Florida observed that one of the major factors in learning problems was an allergic reaction to ordinary substances, and especially food. Many children in his school suffered from metabolism problems. Stress is an important factor because stress accelerates the need for nutrients and decreases the efficiency of absorption and metabolism.⁷ At

⁶Watson, G. Nutrition and Your Mind (New York: Harper and Row, 1972), pp. 10-59.

⁷von Hilsheimer, George. "Allergy, Toxins, and the Learning-Disabled Child," Academic Therapy (San Rafael, 1974): 7-25.

the Green Valley School the average stay improved from twenty-four months to eight months when the diet was changed by substantially reducing the sugar and carbohydrates and increasing the B vitamins in organic foods.⁸ Klotz reported on the Green Valley School and the use of diet control. He observed that it is important to note and remember that the mind and body function together.⁹ Food allergic reactions and the central nervous system responses can be quite varied during an allergic reaction. One common reaction is tension and fatigue; another is acting out. An allergic reaction may be only a part of the problem.¹⁰

Iron deficiency is the most prevalent nutritional disorder in the United States. Symptoms of iron deficiency are fatigue, irritability, and little motivation to explore surroundings. This limited interaction can inhibit and retard learning.¹¹ In reviewing the studies on intellectual

⁸ von Hilsheimer, G. "Reading Achievement as a Function of Maturity, Diet, and Manipulation of Chronic States of High Arousal" in Selected Papers on Learning Disabilities, ed. by J. I. Arena (1971), pp. 269-274.

⁹ Klotz, S. D. "Making the Child Accessible for Teaching-Learning: The Role of the Internist and Allergist in Learning Disabilities," in Selected Papers on Learning Disabilities, ed. by J. I. Arena (1971), p. 305.

¹⁰ Hawley, C. and Buckley, R. "Food Dyes and Hyperkinetic Children," Academic Therapy 10 : 2732.

¹¹ McWilliams, M., Nutrition for the Growing Years, (New York: John Wiley and Sons, 1975), Chapter 3.

functioning in iron-deficient children, Pollitt and Leibel discovered that they were unable to tell whether the poor performance, perceptual disturbances, and conduct problems were the result of iron deficiency or general nutritional inadequacy in which iron deficiency was the only easily identifiable component.¹² Pollitt is now doing more research with four hundred children between the ages of two and six. The children will be tested and blood samples will be classified as (a) iron deficient anemic, (b) iron deficient but not anemic, and (c) normal. Those children whose samples are classified as iron deficient will be given daily doses of iron supplements. By treating the children instead of just studying them, researchers should be able to eliminate the effect of other social and environmental factors, including general nutrition.¹³

There are many theories about why some individuals are more susceptible to certain foods or elements in foods. Cornell pediatrician Myron Winick has summarized the areas of agreement in this area. The wrong kind of food or malnutrition in infancy restricts the growth of brain cells

¹²Pollitt, E. and Leibel, R. L., "Iron Deficiency and Behavior," to be published in the Journal of Pediatrics, March 1976.

¹³Milwaukee Journal, Wednesday, January 28, 1976.

and alters their structure. The younger the child is when the deprivation occurs, the more chance of damage.¹⁴

Effects of Food Additives on the Human Body and Learning

Recently there has been much publicity about the return to "natural" food and the harm done by the use of food additives. Phil White of the Council on Foods of the American Medical Association presented the idea that food additives were a less serious threat to health than was overeating.¹⁵ Others have presented quite different views.

Dr. Ben Feingold has one of the more controversial theories about additives. He believes that certain foods tend to make susceptible hyperactive children more hyperactive, and by withdrawing these foods from the child's diet, more acceptable behavior will result. His diet began as a remedy for allergic reactions such as itching, hives, and sneezing; parents reported that improved behavior was a byproduct of using the diet.

After 1967, Dr. Feingold began using the diet as a method of improving behavior and learning ability. Two groups of food are eliminated from the child's meals. Group I is made up of a number of fruits and two vegetables

¹⁴Beadle, Muriel, A Child's Mind (New York: Doubleday and Company, 1970), p. 207.

¹⁵Henderson, L. M. "Nutritional Problems Growing Out of New Patterns of Food Consumption," Chapter 11 in The Nutrition Crisis by T. P. Labuza (St. Paul: West Publishing Company, 1975).

which contain natural salicylates; Group II is made up of all foods that contain a synthetic color or flavor. The complete list of the two groups appears in the appendix. There are no tests to determine whether a child will show an unfavorable behavioral response to any food in the two groups. The allergy skin tests are not applicable. Every food must be systematically eliminated and the response observed.¹⁶

Dr. Feingold does not do research; he bases his opinion about the salicylate free diet on clinical observation. He had observed that 40 percent and 50 percent of the hyperactive children in his own group of three hundred and fifty were helped.¹⁷ The first controlled study of the effect of food additives on hyperactive children was done by Connors at the University of Pittsburgh. The results tend to confirm Dr. Feingold's findings. Teachers and parents observed fifteen children for twelve weeks, noting behavior changes. Both the control and experimental diets were similarly high in nutrition. The experimental diet eliminated fruits with natural salicylates (apples, berries, peaches) and all foods with artificial coloring,

¹⁶Feingold, B. F. Why Your Child is Hyperactive (New York: Random House, 1975), pp. 11-174.

¹⁷Milwaukee Journal, July 25, 1976.

flavors, preservatives or other additives. The teachers noted significant behavior improvement while the parents reported only slight improvement. According to Connors:

We cannot say whether the natural salicylates, food colors, food flavors--or indeed some unsuspected nutritional factors--might not be responsible for the results.¹⁸

Another research project is presently being conducted at the University of Wisconsin-Madison. Preliminary findings did not indicate a strong link between the behavior of the hyperactive child and artificial flavors and colors.

The behavior of forty-six boys, aged three to twelve is being monitored. They were fed an experimental diet free from artificial flavors and colors and a control diet that included such additives. Behavior was rated by both teachers and parents. Only the children in the youngest age sample showed support for the experimental diet. When completed, this will have been the first systematic investigation of Dr. Feingold's hypothesis. The findings reported here are preliminary and should not be interpreted as conclusive.¹⁹

¹⁸Mental Retardation News. National Association for Retarded Citizens 25 (April 1976).

¹⁹Harley, J. P., et al. "Food Additives and Hyperactivity in Children," unpublished report from the Food Research Institute, University of Wisconsin-Madison (March 1976).

Dr. Randolph is another who bases his theory on clinical observation and personal viewpoint. His main concern is with the additives which may come into contact with foods during growing and processing. He has observed that susceptibility to chemical additives and contaminants of air, food, water and biological drugs and chemically derived drugs has been the leading factor in one-third of all of his chronically ill patients and a contributing factor in another one-third. Dr. Randolph also uses the controlled diet by having the patient fast and then introduce the foods and observe the response. His program is: (1) discover the possible culprit food on the basis of probability and details from the patient's history; (2) suspected exposures are eliminated concurrently; and, (3) eliminate the incriminated materials, if possible.

Foods to be avoided are in the following categories: (1) foods that often contain spray residues including fruits, vegetables, some meats and poultry; (2) foods that often contain fumigant residues--dried fruit and grain; (3) foods often containing bleaches, mainly white flour; (4) foods often treated with sulfur--dried fruits and corn products; (5) foods artificially colored; (6) foods artificially sweetened; (7) foods exposed to gas--artificially ripened fruits, coffee, and cane and beet sugars; (8) foods contaminated by containers; (9) foods often waxed with paraffin; and (10) foods often containing desiccating agents--triscuits and prepared coconut.

Foods that are usually less contaminated and can be eaten safely are: (1) some fish and meat--fresh or frozen seafood and lean meat from which the fat has been stripped before cooking; (2) vegetables--fresh potatoes (if undyed), turnips, rutabaga, eggplant, and parsnips (if not waxed), tomatoes (if field ripened), carrots (not bagged in plastic), and green vegetables (if fresh, frozen, or canned in glass); (3) fruits--nuts in shell only; (4) sweetening agents--honey, sorghum and pure maple; and (5) fats and oils.²⁰

Dr. Randolph's treatment is restrictive and consists of the avoidance of demonstrated offenders. The foods to avoided by the susceptible person are discovered by: (1) fasting under experiment controlled conditions; (2) withdrawal effects are accentuated before gradually subsiding; (3) single foods (not chemically contaminated) are fed one per meal as clinical effects are observed; and (4) the negative foods are tested under observation. Of over three thousand patients in the past sixteen years, over five hundred presented evidence of a cerebral site of reaction. These symptoms covered the full range of mental and behavioral disturbances. Commonly eaten foods and environmental chemicals were most frequently incriminated as specific

²⁰Randolph, T. G. Human Ecology and Susceptibility to the Chemical Environment (Springfield, Ill: Charles C. Thomas, 1972), pp. 11-117.

addictants.²¹ Dr. Randolph's diet is not something a person should try on his own. The process is usually not hazardous, but should be carried out with medical supervision. Due to the unsatisfactory food labeling, it is almost impossible to avoid all the sources of corn, wheat, milk, eggs, yeast, etc., without a list of detailed instructions.²²

Dr. Hawley, having treated at least one thousand children with behavior and learning disabilities who were maladapting to the environment which includes food, found that nutrition usually was not a problem once the "junk" foods and crystalline sugars were removed. Any food or combination of foods could be the cause of the problem.²³

Summary

A review of the literature and research concerning nutrition, behavior, and learning indicated a definite interest in the subject. Because of the complexities of isolating nutrition, there were various theories presented. Everyone accepted the idea that some individuals are more susceptible to food and chemical allergy and reaction than

²¹Randolph, T. G., Rosenzweig, L. and Kailin, E. W., "Food Addiction and Ecologic Mental Illness," presented at the 1971 Annual Scientific Assembly of the Medical Society of the District of Columbia (September 1971).

²²Randolph, T. G. "The Realities of Food Addiction," reprinted from Health News and Views (Summer 1971); Metropolitan Chicago Area: Human Ecology Study Group.

²³Hawley, Dr. Clyde, personal correspondence, March 1976.

other people. There were differing opinions as to what might cause this susceptibility. One theory had to do with the body not utilizing food properly; another had to do with eating an improper proportion of carbohydrates, proteins, and fats. Stress was presented as a major problem, as was iron deficiency.

Food additives have received much attention. Some experts felt that they did little or no harm and others felt that susceptible people can be adversely affected. Most of the literature pertained to clinical observation and personal viewpoints. Systematic research projects' relating to nutrition and learning are just beginning to emerge. More sophisticated measuring methods and devices will be needed if future research is to be of any value.

CHAPTER III

IMPLICATIONS

Introduction

This chapter presents the practical application of the material previously reviewed. Unfortunately, few teachers and parents are aware of the theories on nutrition and learning.

When in limited instances such information is imparted to teachers, they come out either overwhelmed or are made to feel silly through another high school unit on nutrition.¹

Practical Application of Information

Controlled diets might be used in place of drug therapy. Even if symptoms are relieved by drugs, it is important that parents not stop working on the problem.² Most do not use drugs with the controlled diet.

Diet is one element of the environment which can be controlled. Of course, it is advisable to use any of these diets only under a doctor's supervision. However, if a parent or teacher is aware that a child's behavior is

¹Jani, S. N. and Jani, L. A., personal correspondence, March 12, 1976.

²von Hilsheimer, George, Allergy, Toxins and the Learning-Disabled Child, p. 23.

satisfactory in the morning and deteriorates in the afternoon, it would not do any harm to see what he is eating for lunch. A nutritionally sound lunch might be substituted for several weeks and the response observed. Such a minor change in diet would not be harmful. Parents can observe any behavior change after a certain food is eaten. This information could then be presented to a doctor. By alerting themselves to the possibility of an allergic reaction to foods and additives, parents and/or teachers might be more able to recognize symptoms.

Summary

If parents and teachers were more aware of the symptoms of the susceptible child's allergic reactions to certain foods, combinations of food, and/or additives, they might be able to work with a doctor in discovering the reason for unacceptable behavior and learning problems. Parents can experiment a little with the food fed to a child, but if they wish to use one of the diets previously described, they should do so under medical supervision.

CHAPTER IV

SUMMARY AND CONCLUSION

The primary purpose of this paper was to review the literature and research pertaining to nutrition, behavior, and learning. A secondary purpose was to suggest practical application of this information.

Review of the research and literature on the subject seemed to indicate that more professionals are becoming involved in the use of nutritional control to treat learning and behavior problems. In the past, information has been received through clinical observation, but presently more controlled research projects are being conducted. Because of the complexities in isolating various nutrients, this can be a very complicated matter.

Parents and teachers can utilize the information from this literature by merely being aware of the possibility of a link between nutrition, behavior, and learning. If aware, they can become more alert in observing children.

The conclusion reached was that more study and research on nutrition, behavior, and learning is feasible and necessary before nutrition can be called a causative factor in behavior and learning.

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Hawley, C. Livermore, California. March 1976.

Jani, Subhash N. and Linda A. Western Illinois University,
Macomb, Illinois. March 12, 1976.

APPENDIX

SAMPLE LETTER

Dear _____ :

I am currently writing a research paper in partial fulfillment of the requirements for a master's degree in learning disabilities. This paper has to do with the possible relationship of nutrition, behavior, and learning. Once completed, it will be available at Cardinal Stritch College, Milwaukee, Wisconsin.

While reading the _____ issue of _____
_____ Journal, I read your article "_____
_____" . I would greatly appreciate any further information you might have about this project.

Enclosed is a self-addressed, stamped envelope for your convenience.

Thank you for your time,

Anna Miller

FOODS ELIMINATED BY DR. FEINGOLD'S DIET

GROUP I

This is the list of fruits and vegetables that contain natural salicylates. They must be omitted in any and all forms--fresh, frozen, canned, dried, as juice or as an ingredient of prepared foods.

FRUITS

Almonds
Apples
Apricots
Berries
 Blackberries
 Boysenberries
 Gooseberries
 Raspberries
 Strawberries
Cherries
Currants
Grapes and raisins or any
 product made of grapes,
 e.g. wine, wine vinegar,
 jellies, etc.
Nectarines
Oranges (Grapefruit,
 lemon and lime are
 permitted)
Peaches
Plums and prunes

VEGETABLES

Tomatoes and all tomato
 products
Cucumbers (pickles)

GROUP IINOT PERMITTEDCEREALS

All cereals with artificial colors and flavors
All instant-breakfast preparations

BAKERY GOODS

All manufactured cakes, cookies, pastries, sweet rolls, doughnuts, etc.
Pie crusts
Frozen baked goods
Many packaged baking mixes

LUNCHEON MEATS

Bologna
Salami
Frankfurters
Sausages *
Meat loaf
Ham, bacon, pork*

ALL POULTRY

All barbecued types
All turkeys with prepared basting, called "self-basting"; prepared stuffing

PERMITTEDCEREALS

Any cereal without artificial colors or flavors, dry or cooked

BAKERY GOODS

Any product without artificial color or flavor, but most bakery items must be prepared at home
All commercial breads except egg bread and whole wheat (usually dyes)
All fours

ALL MEATSALL POULTRY EXCEPT STUFFED

* When colored or flavored, usually indicated on the package.

<u>NOT PERMITTED</u>	<u>PERMITTED</u>
<u>FISH</u>	<u>ALL FRESH FISH</u>
Frozen fish filets that are dyed or flavored; fish sticks that are dyed or flavored	
<u>DESSERTS</u>	<u>DESSERTS</u>
Manufactured ice creams, unless the label specifies no synthetic coloring or flavoring; the same applies to sherbet, ices, gelatins, junkets, puddings	Homemade ice cream without artificial coloring or flavoring
All powdered puddings	Gelatins--homemade from pure gelatins, with any permitted natural fruit or fruit juices
All dessert mixes	Tapioca
Flavored yogurt	Homemade custards and puddings
	Plain yogurt
<u>CANDIES</u>	<u>CANDIES</u>
All manufactured types, hard or soft	Homemade candies, without almonds
<u>BEVERAGES</u>	<u>BEVERAGES</u>
Cider	Grapefruit juice
Wine	Pineapple juice
Beer	Pear nectar
Diet drinks	Guava nectar
Soft drinks	Homemade lemonade or limeade from fresh lemons or limes
All instant-breakfast drinks	Seven-Up
All quick-mix powdered drinks	Milk
Tea, hot or cold	
Prepared chocolate milk	
<u>MISCELLANEOUS ITEMS</u>	<u>MISCELLANEOUS ITEMS</u>
Oleomargarine	All cooking oils and fats
Colored butter	Sweet butter, not colored or flavored
Mustard	Mustard prepared at home from pure powder and distilled vinegar
All mint-flavored items	Jams or jellies made from permitted fruits, not artificially colored or flavored
Soy sauce, if flavored or colored	
Cider vinegar	
Wine vinegar	
Commercial chocolate syrup	

NOT PERMITTED

Barbeque-flavor potato
chips
Cloves
Catsup
Chili sauce
Colored cheeses

PERMITTED

Honey
Homemade mayonnaise
Distilled white vinegar
Homemade chocolate syrup
for all purposes
All natural (white)
cheeses

SUNDRY ITEMS

Practically all pediatric medications and vitamins contain artificial color and flavors. When medications are required, a physician should be consulted.

Most over-the-counter medications contain aspirin, as well as artificial flavors and colors, e.g., Aspirin, Bufferin, Excedrin, Alka-Seltzer, Empirin, Empirin Compound, Annacin.

All toothpastes and toothpowder*
All mouthwashes
All cough drops
All throat lozenges
Antacid tablets
Perfumes

- * A salt-and-soda mixture can be used for cleaning teeth.
Neutrogena soap (unscented) can be substituted for toothpaste or powder.