Better Nutrition Studies

By F. BARBARA ORLANS

Nutrition experiments. What is the first thing that comes to mind when you hear those words? Do you think of *deprivation* studies or something else? Those teachers and students who equate nutrition experiments with deprivation studies betray a decided lack of imagination. Unfortunately, various commercial bodies have so successfully promoted inadequate-diet experiments on animals (by providing free animals and "deprivation kits") that high school teachers have been conditioned to accept these studies in the curriculum and as suitable science-fair projects, often to the exclusion of more revealing experiments. This heavy reliance on improper-feeding experiments should be replaced by nutrition studies that are more humane and more relevant to society's needs.

What's Wrong with Deprivation Studies

Present guidelines for the use of animals in science fairs require that deprivation-of-nutrients experiments "proceed only to the point where symptoms of the deficiency appear" (National Society for Medical Research Ad Hoc Committee, 1969). However, this caution has proved ineffective because inexperienced youngsters working at home (and even teachers, if untrained in pathology) cannot identify that "point." The lingering death of deprived animals has been reported at several science fairs, and yet the students have said they had no idea the animals were so sick.

These guidelines also require that after disease symptoms appear the dietary deficiency shall, if possible, be corrected; otherwise the animals must be humanely put to death. As most youngsters do not have the experience, the equipment, or the knowledge of the symptoms and doses needed to fulfill these requirements, they should not undertake diet-deficiency experiments for science competitions.

In addition to the technical difficulties of conducting these experiments properly, there are moral, psychologic, and social objections to deprivation studies in elementary and secondary schools. Is it morally justifiable to demonstrate established facts over and over again when animal suffering is involved? If the intentional infliction of crippling disease is tolerated, then with as much justification the effects of bad driving could be portrayed by squashing animals between metal and concrete until their bodies are crushed. Plainly, the adverse effects of such demonstrations outweigh their possible educational benefits. Surely the many alternative ways of conveying the same information—movies, discussions, and the like—are preferable to those that harm animals.

How readily do students relate their own food habits and human nutritive problems to the experience of watching rats slowly losing their hair and developing swollen eyes, bloody nostrils, and pneumonia? A youngster may not be persuaded by the teacher's directive, "Well, now go and eat a good breakfast."

Hurting Animals Has Hardening Effects

It is of paramount importance that the child first develop a positive attitude to life and be protected

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from violent experiences. A youngster is not asked to put an animal to death; nor should he be required to hurt one. Yet insensitiveness to these issues has led the National Dairy Council (1968) to promote *second*-grade class demonstrations of growth retardation in chickens not fed milk products. Such activities can be emotionally upsetting or—even worse—emotionally desensitizing or hardening, to immature minds. It is wrong to condition children from an early age to watch or participate in hurting animals. How much better it would be to have second-graders undertake studies suggested in the *Kindness Club Project Manual* (National Humane Education Center, 1969).

A manual produced by another commercial enterprise to promote inadequate-diet experiments on animals by young students states, "One who loves animals will deeply sympathize with the [diseased] animals when their symptoms appear but he must realize that this is the result we have been working for. . . ." (General Biological Supply House, 1937). But should we help children to overcome or, on the other hand, to preserve their reluctance to hurt animals? Sensitive youngsters turn away from deliberate infliction of pain and disease on helpless animals. They do not want to be responsible for causing animals to become blind, unable to walk, or retarded in growth. There are many accounts of teenagers sabotaging class demonstrations of inadequate-diet effects by slipping the mice wholesome nourishment when the teacher wasn't looking. In these formative years, should not kindly instincts be fostered rather than suppressed?

Disproportionate Emphasis on Vitamins

The U. S. Food and Drug Administration has said, "Vitamins and minerals are supplied in abundant amounts by commonly available foods. Except for persons with special medical needs, there is no scientific basis for recommending routine use of dietary supplements" (*Federal Register*, Dec. 14, 1966: 31 FR 15746). Many food and drug company advertisements, however, prefer to suggest that large numbers of affluent, overfed Americans may suffer vitamin deficiencies, and too many teachers unwittingly promote this fancy by undue attention to vitamin-deficiency experiments. James L. Goddard, former commissioner of the U. S. Food and Drug Administration, has declared, "We may *already* have achieved an optimum of *mis*understanding about the nature and value of [vitamin] products" (Goddard, 1968; italics in original).

Attention should be directed, instead, to the real American problem: obesity. As many as 23% of teenage girls and 18% of teenage boys are obese—and obese youngsters are less likely to be accepted at high-ranking colleges (Canning and Mayer, 1966). Among the middle-aged, obesity is accompanied by a threefold rise in heart disease. Among the poor, some 44% of women and 34% of men are obese (Goldblatt, Moore, and Stunkard, 1965). How instructive and constructive it would be, if youngsters (especially those from improverished homes) were told to purchase a week's breakfast of high nutritive value for a small sum, recording the relative costs of protein, carbohydrates, and fats. Constructive advice about fad foods and the factors that result in obesity would constitute practical education in nutrition. Sound, scientific facts and answers to commonly asked questions about obesity are provided by the professor of nutrition at Harvard University in an excellent book, *Overweight* (Mayer, 1968).

Sound Ways of Teaching Nutrition

Of course, there are many ways to learn about the deleterious effects of poor diet without harming or killing animals. Clive M. McCay, professor of nutrition at Cornell University, has pointed out that "hundreds of good nutritional experiments . . . can be done without any suffering of the animal(s)" (McCay, 1956). For instance, compare the rates of growth of animals kept on (i) standard laboratory chow given *ad lib.* with those kept on (ii) a varied diet comprising many different kinds and tastes of foods and those on (iii) a varied diet with high protein content. Does diet affect their social behavior? Demonstrate in class how animals, when offered both suitable and unsuitable foods, will select a balanced diet of correct proportions and amounts. The lesson is, if rats can do this, so perhaps can teenagers! Measure the metabolic rates of animals and human beings. Show photographs or movies of well-conducted demonstrations of improper animal diet. (See references for movies.) Make chemical analyses of foods for mineral content.

Keep a detailed record of students' eating habits and assess the nutritive values. Elicit reaction time, decision-making ability, and work ability of a group of students who have regularly omitted breakfast for four weeks; then have them eat a good breakfast and retest, comparing the results. (A simple, standard psychologic test, which could be used, is the time taken to sort a deck of cards into suits and rank. The results may comport with recent professional findings that made use of a variety of tests: when breakfast was omitted students took longer to make decisions, had less neuromuscular control, and did less work.) Collect data on the school-lunch and milk programs: does the availability of hot lunches and milk coincide with distribution to the neediest children?

Study newspaper accounts of famine in Biafra or India. Read the recent HEW national survey of malnutrition in the United States, by Arnold E. Schaefer (1969). Make a study of local welfare distribution to the indigent and try to assess its adequacy. Study the objectives of the National Council on Hunger and Malnutrition in the United States

and read its Action Reports (available from the Council, 1211 Connecticut Ave., N.W., Washington, D.C. 20036). Ponder the concise book, *Still Hungry in America*, by Coles and Clayton (1969).

Check local shops for fortified or enriched foods; for example, milk or bread to which vitamins and other nutrients have been added, and iodized salt. (A recent national survey found that 5% of people examined had an enlarged thyroid gland, indicating iodine deficiency; yet 40% of food markets surveyed in Texas failed to stock iodized salt and the shopkeepers were unfamiliar with its purpose [Schaefer, 1969].) Compare the cost of milk fortified with vitamin D with the cost of unfortified milk. Currently there is no law governing the enrichment of foods; discuss the advisability of such a law.

The following examples are taken from interesting nutrition pamphlets issued by the U.S. Food and Drug Administration (see references). Ask the students to make a list of food additives on labels of foods that have been purchased for use at home and determine which are useful and which are potentially harmful (such as monosodium glutamate in baby foods and cyclamates in soft drinks—both of which were recently banned). Check labels from a variety of foods and classify all label statements according to which requirements of the Food, Drug, and Cosmetic Act the statements are intended to meet. Give three students an identical shopping list (for example, bread, orange juice, cheese, and canned peas) and have them shop individually, without adult help. Compare their purchases and have them explain how they decided on each purchase. Compare methods of food preparation and preservation 50 or more years ago with present-day methods. Visit a grocery warehouse, a food-processing plant, or a farmer's grain bin.

Many other studies could be added, but enough suggestions have been offered to indicate the range of pertinent and compassionate investigations that will inform students about current problems while providing a sound education in nutrition.

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The following films describe the role of vitamins and the effects of deficiency. Names of firms that lend the films without rental charge are given in parentheses.

Foods and nutrition, b/w, 11 min.; Encyclopaedia Britannica Films, Wilmette, Ill.

Vitamins, b/w, 14 min. (Medical Motion Pictures, Merck Sharpe & Dohme, West Point, Pa.)

Vitamins and some deficiency diseases, color, 35 min. (Lederle Laboratories, Pearl River, N.Y.)

Vitamins and your health, color, 20 min. (Eli Lilly Co., Indianapolis, Ind.)

Cooperation in Arctic Research

"Scientists of every nation will be welcome to cooperate with any Arctic research activities under NSF sponsorship," William D. McElroy, director of the National Science Foundation, said at an international symposium inaugurating a new building at the Geophysical Institute, University of Alaska.

Discussing Arctic research policy and planned scientific activities, he said that for polar scientists the "critical question" today is how to encourage sincere international cooperation in Arctic research. He announced plans for a project, developed recently by U.S. and Canadian scientists, called Arctic Ice Dynamic Joint Experiment (AIDJEX). This will be a concerted study of sea ice as an impediment to shipping. Early concepts call for manned and unmanned ice stations, submarines, and aircraft to map 100 km^2 of ice, from which models will be developed to use in predicting movement of the ice pack.

"The needs of science should not be used as an excuse to defer action," McElroy said. "But if the northern regions are to be developed for man's use, that development must be discriminating. . . . Protection of the environment must go hand in hand with development of the Arctic." He added, "If man is to move, operate, and settle in harmony with this unique and fragile wilderness, additional information about the terrestrial and marine environments must be available to prevent irreversible harm."