

RECENT PUBLIC
EDUCATION EFFORTS ABOUT
HEALTH AND DIET

Alan S. Levy, FDA and
James T. Heimbach, USDA

The FDA Health and Diet Survey (HDS) have tracked consumer awareness and knowledge of diet/disease relationships during a period (1978-1988) when there have been at least 3 major programs to publicize the role of diet as a risk factor for chronic diseases. This paper presents trend data from the surveys and related market data that identifies some of the cognitive impacts of these education programs. Despite using different messages and different implementation strategies, all 3 programs have been very successful at raising awareness of specific diet/disease relationships among all segments of the population.

INTRODUCTION

A consensus about the potential value of encouraging healthier dietary habits in the population seems to have emerged among the public health, medical and scientific communities in the past 20 years. Data has accumulated that certain dietary patterns are associated with increased risks for chronic and degenerative diseases including heart disease, stroke, obesity and cancer (NAS, 1989; DHHS, 1988). Nutrition education is increasingly being seen as a means to reduce population risk factors for these diseases, a means which is an alternative to more costly kinds of medical and clinical intervention strategies.

The Dietary Guidelines for Americans (DHHS/USDA, 1978), for example, suggest that for a healthier diet Americans should eat less fat, particularly saturated fat, cholesterol and sodium while increasing consumption of complex carbohydrates and fiber. There have been a series of recent scientific reviews (DHEW, 1979; DHHS, 1980; DHHS, 1983; NRC, 1982; NIH, 1986), that have recommended as a matter of public policy the reduction of dietary risk factors for various chronic diseases. With this mandate, the National Institutes of Health, notably the National Heart, Lung and Blood

Institute (NHLBI) and the National Cancer Institute (NCI) have undertaken nutrition education activities to promote healthier food habits among the general public.

In collaboration with NHLBI, FDA has conducted a series of national telephone surveys, known collectively as the Health and Diet Surveys, which were intended in part to be evaluation instruments for assessing the impact of nutrition promotion activities engaged in by FDA and other Federal agencies (Heimbach, 1985; Schucker, et al., 1987). The purpose of this paper is to examine the results from these surveys and available market data on trends in consumer beliefs, knowledge and reported health behaviors that seem to be related to these public education efforts. Informing and educating the public about the health effects of diet is a difficult undertaking. Understanding how effective these program have been and the limits to their effectiveness should have broad applicability to other campaigns and circumstances and should enhance the chances of designing successful information programs.

NATIONAL HEALTH AND DIET PROGRAMS

The three national programs addressed in this paper are the National High Blood Pressure Education Program (NHBPEP) (NHLBI, 1979), the National Cholesterol Education Program (NCEP) (Lenfant, 1986), and the Cancer Prevention Awareness Program (CPAP) (NCI, 1984). Each of these programs includes components other than public education in diet and health; for example, each also endeavors to encourage the public to receive appropriate screening tests and conducts information programs for health professionals. Here, we will be concerned only with their diet/disease public education aspects.

The common theme for these initiatives and the hallmark of recent U.S. public education efforts in diet and health is the link made between recommended dietary changes and reduced risks of chronic disease. Each of these programs takes as its objective raising awareness and understanding about specific diet/disease relationships. Each program, however, takes as its focus a different diet/disease relationship; the NHBPEP focuses on the link between sodium and hypertension; the NCEP is concerned with the relationship between fat,

particularly saturated fat, blood cholesterol and heart disease; and the CPAP is interested in cancer and its possible links to fat and fiber in the diet.

A distinctive characteristic of all these programs is that they are not Federal government controlled information campaigns. They are made up of a loose collection of separate activities sponsored by varying coalitions of public and private organizations. Important contributors to the process include the news media and the food industry along with a number of professional, scientific and consumer groups. The self defined Federal government role is to foster more activity by setting objectives, by supporting basic research, by monitoring the health and nutrition status of the American population, by seeking to create a consensus among the scientific and public health communities about appropriate recommendations for dietary practices. The common emphasis is on applying the latest scientific understanding of diet and health links to dietary guidance for the public.

The nature of the Federal government role is nicely suited to the needs of the news media. In recent years, U.S. news media have expanded their coverage of health issues, introducing innovations such as regular health features on local news broadcasts, weekly supplements in daily newspapers devoted to health topics, and an increasing number of specialized magazines and television programs dealing with health and fitness topics. The government and other participants in public education efforts such as industry and consumer groups are willing suppliers to this demand from the media for health news. The strategy of developing consensus positions based on the latest scientific research is ideally suited to the needs of the news media for self contained stories which can be presented concisely without too many qualifications. News delivered by the popular print and broadcast media has become an increasingly important channel for disseminating health and diet information to the general public.

The communication strategy of making dietary recommendations based on the latest scientific understanding of diet and disease links has to be seen in relation to the existing public opinion context for diet and health issues in the U.S. Available data

from the Roper Surveys (Roper, 1985) indicates that the level of general interest and concern about nutrition has been at a consistently high level in the U.S. population since at least the mid 1970's. There has been little change, for example, in response to survey questions asked in 1976, 1978, 1980, 1983 and 1985 such as "How important to you is the nutritional value of the food you eat?" or "How important to your personal health and well-being is the amount and kind of food you eat?" Throughout this period, almost 90% of the public reported they considered the nutritional value of food to be very important and 60% considered their diets very important to their health.

METHODS

Data Sources

The basic approach taken in this paper is to treat the three national programs as case studies, and to review in each instance available trend data in order to identify their impacts on public knowledge, belief, and behavior. The primary data sources, available in all instances, are public opinion tracking surveys conducted by FDA that were designed to evaluate the cognitive impacts of these kind of public nutrition education initiatives. Key measures assess causal knowledge and concern about specific diet/disease relationships emphasized by the various health and diet program. Knowledge/concern levels are generally assessed by open ended, non-directive questions about specific dietary causes of heart disease, hypertension and cancer and about possible health problems related to intake of fats, cholesterol, sodium and fiber.

The surveys consist of telephone interviews with nationally representative samples of about 4,000 consumers, and provide information about what the public believes about relationships between diet and health. By comparing the responses given to the same questions asked from year to year, we can estimate trends and relate these trends to ongoing public education activities. (Unless otherwise specified, all data in the tables are from the Health and Diet Survey.)

Changes in public knowledge and belief that occur contemporaneously and are consistent with the message content of public information campaigns are the most sensitive and compelling indicators of the effectiveness of

such campaigns.

RESULTS

Sodium and Hypertension

The primary objective of the joint FDA/NHLBI sodium initiative which began in 1981 as part of the NHBPEP was to educate the public about the links between sodium or salt and high blood pressure. As part of the

initiative, FDA began to encourage manufacturers to voluntarily provide sodium content information on the food label and to lower the amount of sodium in processed food. FDA also proposed that sodium content information be required for nutrition labeling. In coordination with the NHBPEP, a number of public and professional education efforts were initiated, including publications, public service announcements, media, mailings, the development of a modular television package on sodium for use by local television stations, demonstration projects and training workshops for nutritionists, dietitians, physicians and other health professionals. The initiative and its various parts were covered extensively in the popular print and electronic media.

The effect of the 1981 initiatives is striking: Between 1979, when NHLBI conducted a survey of public knowledge and reported behavior related to high blood pressure (NHLBI, 1981), and the 1982 HDS, public awareness of the relationship between sodium and hypertension nearly tripled, from 12% to 34%. Since 1982, top of the mind awareness of sodium/salt as a risk factor for hypertension has remained at the 1982 level.

Food manufacturers responded to this consumer demand by introducing a number of sodium-reduced products: an average of more than nine new products per month throughout 1983 as compared to only four products per year prior to that date (FDA, 1987). As of summer 1988, 89% of Americans have seen such products, 64% have bought them at least once, and 19% regard themselves as regular buyers. It is interesting to note that between 1982 and 1984, the major movement was from "have not seen such products" to "have seen but not bought", while between 1984 and 1988 there has been steady increases in the reported levels of regular purchases of such products.

Home use of table salt is a clear behavioral indicator of the level of consumer concern about sodium because it is easily controllable behavior that directly reflects this concern. Consumer purchases of table salt in U.S. supermarkets showed a sharp decline beginning in 1981, with sales tonnage falling 12% between the base year 1979 and 1983 (A.C. Nielsen, 1985). Sales of table salt have stabilized in recent years at the lower post-initiative level indicating the lasting impact of the sodium/hypertension initiative.

Major Perceived Causes of High Blood Pressure*

	1979-1988		
	1979 %	1982 %	1988 %
Emotional pressure/Stress	49	50	53
Salt/Sodium	12	34	34
"Poor"/Unbalanced diet	30	32	11
Overweight	26	27	28
Heredity	12	16	16
Fats/Cholesterol	6	16	35

*Source for the 1979 data:
NHLBI Survey of the Public
and High Blood Pressure

Awareness and Purchase of Low Sodium Products

	1982	1984	1986	1988
	%	%	%	%
Have Purchased such Products	49	46	61	64
Regularly	13	11	16	19
Sometimes	22	20	30	30
Rarely	14	15	15	15
Have seen but not bought	22	40	27	24
Have not seen such products	29	14	12	11
Total	100	100	100	100

U.S. Supermarket Sales of Table Salt
(Conversion Basis = Pound)

	1979	1981	1983	1985
	460,112	452,737	402,601	405,045
	100%	98%	87%	86%

Fiber and Cancer

In early 1984 the National Cancer Prevention Awareness Program initiated a multi-year effort aimed at increasing the public's knowledge of risks related to cancer and encouraging behaviors that may reduce people's chances of getting cancer. The most visible element of the initiative was a cooperative effort with the Kellogg Company to publicize the possible value of a low fat, high fiber diet for preventing certain kinds of cancer. This message was carried in advertising and on product labels of Kellogg's high fiber breakfast cereal, All Bran. This aspect of the cancer education initiative was both innovative and controversial. The high fiber/cancer prevention message incorporated in consumer product advertising was supported by a multi-million dollar national print and television campaign (estimated at \$15 million for the first year) which began in October 1984, a level of paid effort an order of magnitude larger than anything in previous diet and health education campaigns. The fact that the message was closely associated with a certain type of commercial product also distinguished it from the broad dietary recommendations that have characterized other efforts.

Dietary Components Believed to Prevent Cancer

	1984	1986	1988
Any component named	32	54	48
Vegetables/Fruits	10	22	31
Fiber/Bran/Roughage/Whole grains	9	32	28
Vitamin C/Ascorbic acid	5	3	2

The impact of the Kellogg/NCI initiative on consumers and the industry was striking, both in terms of increased public awareness of fiber and cancer and in terms of increased sales of high fiber cereals. In the 1984 Health and Diet survey, conducted before the start of the Kellogg/NCI initiative, respondents were asked what things they had heard that people might eat or drink to help prevent cancer fiber was named by 9% of the public and fruits and vegetables by 10%. By 1986, less than 18 months after the beginning of the initiative, the percentage of people who named fiber more than tripled to 32% and mention of fruits and vegetables doubled to 22%. By 1988, top of the mind mentions of fiber as a cancer preventive pulled back slightly from

the 1986 levels to 28%, and fruits and vegetables have regained then status as the number one dietary component associated with cancer. These impressive increases were mirrored by substantial sales gains for high fiber breakfast cereals. Levy and Stokes (1987) examined sales data from a geographically restricted sample of 20 supermarkets. Sales of high fiber breakfast cereals (defined as cereals with at least 4 gms. of fiber/serving) accounted for approximately 6% of the

4 billion a year market for breakfast cereals prior to the Kellogg/NCI initiative. Within one year of the start of the campaign, the market share of high fiber cereals increased to 8% of the breakfast cereal market, a 33% increase worth close to \$80 million in added sales. Sales gains for high fiber cereals are continuing, spurred by a number of new product introductions into the high fiber cereal category which are being supported by heavy promotional spending.

The Kellogg/NCI initiative is a valuable case study of the dynamics inherent in diet and health education activities in the U.S. Within six months of the initial Kellogg All-Bran advertising campaign, there were a number of competitive responses from other companies, including packaging changes, increased advertising budgets, requests to NCI for Kellogg type collaborative arrangements, and most significantly, the introduction of several new high fiber cereals intended to compete directly with Kellogg All-Bran and to benefit from the public's increased interest in the claimed cancer-preventive value of fiber.

Fat, Saturated Fats, Cholesterol and Coronary Heart Disease

The primary objective for the diet/health portion NCEP is to increase public awareness of the relation between high intakes of fat, saturated fat and cholesterol, on the one hand, and elevated blood cholesterol, and coronary heart disease on the other. Key messages include dietary guidance for reducing the percentage of calories from fat in the diet, especially saturated fat, and for limiting the intake of dietary cholesterol. Unlike the situation for sodium/hypertension and fiber/cancer initiatives, there is an extensive history of public education efforts concerned with diet and cardiovascular disease. The American Heart Association and other groups have been implementing diet/heart disease

information campaigns since the 1950's.³⁰

Since the January 1984 release of the results of the Blood Cholesterol Clinical Trial Study, (Lipid Research Clinics Program, 1984) there has been a noticeable increase in diet and health messages in the print and broadcast news media addressing the role of blood cholesterol and specific types of dietary fatty acids as risk factors for coronary heart disease.

Perceptions of Dietary Risk Factors for Heart Disease

	1982 %	1986 %	1988 %
Fats/Foods with fat	29	43	55
Cholesterol/Eggs	26	40	45
Salt/Salty Foods	11	14	17
Eating too Much	5	5	3

Health Problems Believed Linked to Fat Intake

	1984 %	1986 %	1988 %
Have heard of health problems	78	84	84
Heart disease/Heart attacks	51	57	53
Overweight/Obesity	23	25	25
High blood pressure	20	19	13
Atherosclerotic disease	18	24	19
High blood cholesterol	18	18	30

The cognitive impacts of recent attempts to educate the public about

the role of cholesterol in mediating the relationship between dietary fat intake and heart disease have been examined in a series of questions included in the Health and Diet Surveys since 1982.

Overall awareness that heart disease risk may be affected by diet has increased from 58% of the public in 1982 to 76% in 1986 to 83% in 1988. More specifically, belief that excessive consumption of fats, saturated fats, saturated fats, and foods that contain them may cause heart disease has grown from 29% to 43% to 55%, while mention of dietary cholesterol intake as a risk factor increased from 26% to 40% to 45%.

Another way of measuring the impact of efforts to inform the public of the suspected role of fat in causing heart disease is to ask people if they have heard about any health problems that might be related to how much fat they consume. Again, it is clear that there have been significant gains in mention of heart disease and, in particular, mention of high blood cholesterol has increased from 18% in 1984 to 80% in 1988.

Education and the Impact of Recent Diet/Disease Initiative

All of the case studies examined thus far show fairly dramatic increases in population knowledge levels about specific diet/disease relationships associated in time with efforts to publicize these relationships. It seems appropriate to consider whether these increases in knowledge level are distributed equally across the population or whether certain groups are mainly responsible for the increases. The next table gives the population percentage by education level of respondents indicating knowledge of certain specific diet/disease relationships for at least one survey preceding the beginning of the relevant diet/disease initiative and for the most recent survey.

Recent Trends in Public Awareness of Selected Diet/Disease Relationships by Education

Percent Respondents who say that too much sodium or salt is a cause of hypertension.

Education	1973	1986	1988
Not High School Grad	10	37	36
High School Grad	13	43	47
Some College/College Grad	19	53	57

Percent Respondents who say that too much Fat/Saturated Fat/Fried Foods are probable causes of heart disease.

Education	1978	1986	1988
Not High School Grad	12	28	45
High School Grad	21	36	47
Some College/College Grad	33	49	64

Percent Respondents who say that Dietary Cholesterol is a cause of heart disease.

Education	1978	1986	1988
Not High School Grad	10	22	31
High School Grad	22	34	42
Some College/College Grad	37	46	53

Percent Respondents who say that Dietary Fiber can prevent cancer.

Education	1978	1986	1988
Not High School Grad	1	18	15
High School Grad	3	27	21
Some College/College Grad	8	41	36

Educational level is closely associated with the full complex of socioeconomic status indicators such as income, race, occupational status. In the present context education level can reasonably be considered a surrogate for overall socioeconomic

status. Prior to the beginning of the various diet/disease initiatives, respondents with higher education have higher knowledge levels about specific diet/disease relationships. Respondents with at least some college education are more likely to mention specific nutrients or specific nutrient/disease relationships compared to respondents with less than a high school education by factors ranging from 2:1 for sodium, 3:1 for fat/saturated fat, 4:1 for cholesterol and 15:1 for fiber.

However, over the period when the various diet/disease initiative were active there were substantial increases in knowledge levels for all education groups. The magnitude of increases in knowledge levels for specific diet/disease relationships were not greatly different between education groups. On a relative basis, the lower education groups are clearly closing the gap between themselves and high education groups.

Increases in knowledge levels about the cancer preventive effects of fiber, the most recent of the diet/health initiatives, were somewhat greater for higher education groups, but there were not differences at all between education groups in the increases seen with respect to knowledge of sodium, fat or cholesterol. Diet/disease information programs do not appear to eliminate differences in knowledge levels between education groups, but neither do they exacerbate these differences. All education groups seemed to derive substantial cognitive benefits from public information campaigns intended to increase awareness and knowledge of specific diet and disease relationships.

Discussion

Each of the diet/disease health promotion campaigns we have examined in this paper was successful to some degree at raising the levels of knowledge and awareness in the general population about specific nutrient-disease links. Population levels of causal knowledge about sodium and hypertension, for example, increased 280 percent in less than two years following the 1981 sodium initiative. Awareness and knowledge about fiber-cancer in the population increased 350 percent in the two years following the 1984 Kellogg-NCI fiber/cancer prevention campaign. Recent increases in population levels of awareness about the role of dietary fats and blood cholesterol in heart disease

were not modest, between 70 and 90 percent, but these increases were still substantial and have to be seen in light of the higher base of knowledgeable consumers to begin with in the case of dietary factors for heart disease compared to the situation for sodium-hypertension and fiber-cancer.

The communication strategy adopted by each campaign was essentially the same. Science based health messages that identified dietary risk factors for a specific disease in terms of specific nutrient relationships were used in all cases. Mass media exposure of these messages to the public seemed to be a crucial element in each of these campaigns. Mass media exposure could come from either news coverage of the scientific basis for the nutrient/disease claim or from commercial/advertising that presented authoritative science based health messages depending on the relative involvement of industry and government in the campaign. The 1981 sodium/hypertension initiative was largely a government led effort with little paid advertising that relied heavily on the news media to carry the message. The 1984 fiber/cancer initiative was primarily an industry led effort that relied heavily on paid advertising. Recent gains in awareness about the role of fatty acids and blood cholesterol in heart disease seem to be due to coverage of in the news media inspired by the 1984 release of the results of the Blood Cholesterol Clinical Trial Study.

The case studies also demonstrate that cognitive improvements in the general public are associated in a complicated cause and effect fashion with changes in the marketplace, in part, because food companies try to respond to perceived consumer demand for products with desirable nutrition characteristics. The availability of low sodium and high fiber products in the U.S., for example, increased dramatically during the same time periods that cognitive gains occurred in the population. Promotional efforts in support of these new product introductions or in support of established products featuring desirable nutrition characteristics reinforce, and in some instances constitute the major part, of the messages about diet and disease relationships that reach the public. Several instances of significant commercial developments in the marketplace (e.g., reduced consumer purchase of table salt, increased

consumer purchases of high fiber cereal) can be attributed directly to increased consumer concerns about specific diet/disease links.

Based on the U.S. experience with diet/disease health promotion efforts, it seems the substantial cognitive gains can be achieved in all segments of the population when biomedical/science, government, industry and the media coordinate their efforts to deliver health messages about specific diet/disease links to health practitioners and the general public. It is not altogether clear how this recent U.S. experience translates to situations where the scientific legitimacy of a health message is not so evident or where access to mass media communication channels is more limited. A crucial factor in other circumstances will almost certainly be the degree of consensus about a particular health claim within the relevant communities of government, industry and biomedical science. Scientific legitimacy, access to mass media and consensus among the involved parties are necessarily interrelated factors. At least in the U.S., these factors seem to constitute the practical conditions for the success of diet disease health promotion campaigns.

Bibliography

U.S. Department of Agriculture/U.S. Department of Health and Human Services. 1978. Dietary Guidelines for Americans, 24 pg. U.S. Government Printing Office, Washington, D.C.

U.S. Department of Health, Education and Welfare. 1979. Healthy People: The Surgeon General's report on health promotion and disease prevention. DHEW Publication No. (PHS) 795507. U.S. Government Printing Office, Washington, D.C.

U.S. Department of Health and Human Services. 1980. Promoting health/preventing disease: objectives for the nation. DHEW (PHS) Publication No. 79-55071. U.S. Government Printing Office, Washington, D.C.

U.S. Department of Health and Human Services. 1983. Promoting health/preventing disease. Public Health Service implementation plans for attaining the objectives for the nation. Public Health

Reports, September-October (Supp. 1):132-155.

National Heart, Lung and Blood Institute. 1979. Report of the Hypertension Task Force, Vol. 1. General summary and recommendations. NIH Publication No. 79-1623. National Heart, Lung and Blood Institute, Bethesda, MD.

U.S. Department of Health and Human Services. 1981. The Public and High Blood Pressure. NIH Publication No. 81-2118. U.S. Government Printing Office, Washington, D.C.

Lenfant, C. 1986. The National Cholesterol Education Program, Public Health Reports, 101:2-3.

Lipid Research Clinics Program. 1984. The Lipid Research Clinics Coronary Primary Prevention Trial Results. II. The relationship of reduction in incidence of coronary heart disease to cholesterol lowering. JAMA 251:365-374.

National Institutes of Health. 1986. Lowering blood cholesterol to prevent heart disease. Consensus Development Conference Statement, Vol. 5, No. 7. Office of Medical Applications of Research, NIH, Bethesda, MD.

National Research Council, Committee on Diet, Nutrition and Cancer. 1982. Diet, nutrition and cancer. Washington, DC, National Academy Press.

Roper Organization. 1985. Report #85-8, 35. New York, New York.

Heimback, JT. Sodium, Hypertension, and the American public. Public Health Reports, 1985. 100:371-372. A.C. Nielsen 1985

Levy, AS, RC Stokes. 1987. Effects of a health promotion advertising campaign on sales of ready-to-eat cereal. Public Health Reports, 102:398-403.

Heimback, JT. Cardiovascular disease and diet: The public view. Public Health Reports, 1985, 100:5-12.

Schucker, BH, K Bailey, JT Heimback, ME Mattson, JT Wittes,

C Haines, DJ Gordon, JA Cutler, VS Keating, RS, Goor, BM Rifkind. Change in public perspective on cholesterol and heart disease: Results from two national surveys. Journal of the American Medical Association, 1987, 258:3527-3531.

Heimbach, JT. Risk avoidance in approaches to food choice. Clinical Nutrition, 1987, 6:159-162.

Heimbach, JT. The growing impact of sodium labeling of foods. Food Technology, 1986, 40(12):102-107.

Food and Drug Administration. 1987. Sodium Content of the Retail Food Supply,

NAS. 1989. Diet and Health: Implications for Reducing Chronic Disease Risk. National Academy Press. Washington, D.C.

DHHS. 1988. The Surgeon General's report on Nutrition and Health. DHHS (PHS) Publication No. 88-50210. U.S. Government Printing Office, Washington, D.C.