



Examining The Links Between Diet And Cancer

Diet and Cancer: What Have We Learned?

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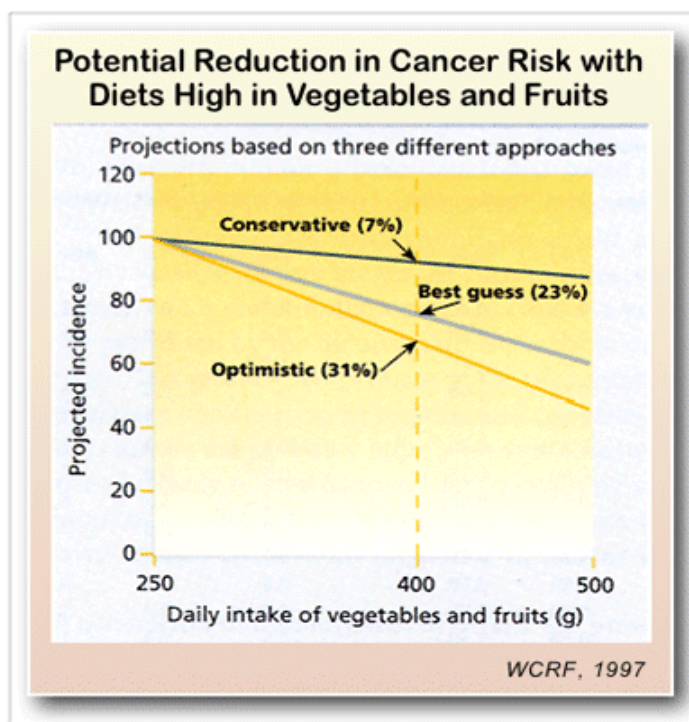
In the mid-1970s, the U.S. National Cancer Institute initiated a Diet and Cancer Program to support investigations in this largely unexplored area. Over the last 25 years, scientific reports on nutrition and cancer relationships have appeared with increasing frequency. What has this body of research revealed?

An Historical Perspective

Many of the earliest studies in the field of diet and cancer were ecologic, examining correlations between cancer rates and cross-sectional dietary exposures, generally based on dietary surveys or national food consumption data and corresponding incidence or mortality rates. Among the earliest was a study by Armstrong and Doll in 1975, which suggested that higher consumption of meat might predispose to colon cancer and that higher intake of dietary fat might predispose to breast cancer.

Subsequent studies emphasized the case-control approach, in which patients with particular types of cancer and suitably matched controls were interviewed about their diets prior to the onset of the disease. Because dietary recall can be biased (inadvertent overestimation or underestimation by cases relative to controls), many investigators initiated large prospective cohorts, such as the renowned Nurses Health Study at Harvard University and the Cancer Prevention Study of the American Cancer Society, as well as the more recent Multiethnic Cohort Study of Diet and Cancer, and the European Prospective Investigation into Cancer and Nutrition (EPIC). While much more costly, these studies obtain dietary information from subjects prior to the onset of illness, thereby obviating the potential recall bias of case-control studies.

Increasingly frequent reports from cohort studies since the 1990s have been crucial to establishing most of the diet-cancer relationships noted below. Although intervention studies (randomized control trials) are considered the ultimate means to explore the relationship of an exposure like diet to cancer, such investigations also have limitations and are rare, due to their enormous cost, difficulty to implement, and the impracticality of testing more than a single exposure level in one study.



Can Diet Increase Cancer Risk?

Many early case-control studies suggested a role of dietary fat, especially saturated fat, in the etiology of cancers at several sites, especially the breast, prostate and colorectum (large bowel). Because the major sources of saturated fat in most Western diets are meat (notably red meat) and whole dairy products, these food groups in particular were implicated. However, subsequent cohort studies have been less supportive of this association. Furthermore, a 2006 report from an intervention trial, the Women's Health Initiative, failed to show a reduced risk of breast or colorectal cancer in women who followed a low-fat diet (though the women only maintained an average fat intake of 29 percent of calories, which is not particularly low). Thus, the role of dietary fat per se in these cancers remains unclear. Nevertheless, there is a strong biologic rationale for such an

effect, and supportive data from animal studies, so the hypothesis remains viable.

Other dietary constituents that may increase the risk of cancer include the heterocyclic amines and polycyclic hydrocarbons formed in meats cooked at high temperature or charcoal-broiled, and nitrosamines that can be formed from foods preserved with nitrates or nitrites (such as processed meats). An established carcinogen for humans is aflatoxin, a substance produced by molds that can contaminate improperly stored ground nuts, legumes and grains.

Obesity, which reflects an energy imbalance in the body, is clearly associated with several cancers, including those of the colon, endometrium, breast (in postmenopausal women), lower esophagus, kidney and gallbladder. And obesity is a growing global problem. Today, in the United States alone, more than 60 percent of adults are estimated to be overweight, with half of them classified as obese. And the developing world has not been spared: Obesity rates in India are now estimated at 15 percent.

Can Diet Lower Cancer Risk?

Vegetables, especially raw or minimally cooked, and to a lesser extent fruits, have been consistently associated with lower risks of many cancers, including those of the lung, esophagus, stomach and colorectum. Vegetables and fruits contain fiber, vitamins, minerals and a variety of non-nutritive constituents, such as carotenoids, flavonoids, indoles and sterols, all of which could account for this protective effect.

The reduced risks associated with vegetable and fruit consumption have been consistent in case-control and cohort studies, although the few intervention studies reported to date have yielded somewhat mixed findings. An expert panel of the World Cancer Research Fund (WCRF) reviewed the evidence on diet and cancer in 1997 and estimated the potential reduction in cancer risk achievable by increasing the consumption of vegetables and fruits (see figure). The figure shows three sets of projections – optimistic (maximal), middle-ground (average) and conservative (minimal) – of the effects of increased daily intakes of vegetables and fruits on overall cancer risk. Using the middle-ground projections, the incidence of cancer could be reduced by more than 20 percent with an average vegetable/fruit intake level of 400 grams/day (as recommended by WHO/FAO). If the average intake were increased to 500 grams/day, the incidence of cancer could be reduced by an estimated 40 percent.

Consumption of whole grains has also been related to lower cancer risk, perhaps because these foods too contribute fiber and other micronutrients to the diet and are relatively low in caloric density. Although dairy foods can add fat to the diet, as noted above, they are also an important source of calcium, which has been identified as a protective factor for colorectal cancer in many studies. Low-fat and skim dairy products provide calcium without increasing saturated fat intake.

Another important protective factor indirectly related to diet through its effect on energy balance is physical activity. Even

in moderate amounts, physical activity has consistently shown a benefit in reducing the risk of colorectal and postmenopausal breast cancers, with more limited evidence for some other sites.

The Jury is Still Out

Among the many reasons for the lack of clear and consistent associations between diet and cancer are the difficulties in valid assessments of dietary intake in free-living populations with access to an enormous variety of foods, the changing patterns of eating over time, and the complexity of the exposure (thousands of different constituents in foods, different methods of cooking and storing foods, etc.).

A more recently recognized complexity is variation in susceptibility among individuals and groups. Currently, research is underway to identify such inherited susceptibility factors and to study diet-gene interactions that may help to clarify associations between food intake and cancer. In 1997, for example, Le Marchand and colleagues in Hawaii showed that Japanese-Americans who consume their meats well-done are more susceptible to colorectal cancer than Caucasians, because they are more likely to carry a variant form of the gene that metabolizes the heterocyclic amines that form in foods cooked at high temperatures.

Whereas the effects of individual dietary components on cancer risk are relatively small (i.e., individuals with high exposures may have twice (or half) the risk of those with low exposure), food is a universal exposure, and the number of persons whose cancers can be attributed to adverse dietary exposures is enormous. Indeed, diet has been variously estimated to account for some 30 percent of the cancer burden in most populations. Nutrition is essential to life, however, so blanket elimination of the exposure as a cancer control measure is not an option.

Paradoxically, at a time when sedentary behavior has dramatically increased in most societies, food portions, both within and outside the home, have expanded. Reducing portion sizes and appropriately adjusting the ratio of meat to vegetables and grains on a typical plate can have an enormous impact on intake.

Modest Dietary Changes Could Reduce Risk

Cancer is a major public health burden in both the developed and developing world. In 2002, the estimated number of incident cancer cases globally was nearly 11 million, with about 40 percent of these in developing regions of the world. Many organizations, such as the WCRF, the World Health Organization (WHO) and the U.S. Department of Health and Human Services, have produced dietary guidelines to lower the risk for cancer (and other chronic diseases). All essentially reach the same conclusions, as summarized in the following table:

Comparison of Dietary Recommendations for Cancer Prevention with Those for Chronic Disease Prevention & Health Promotion

Food Groups or Nutrients	Diet and Cancer Prevention WCRF, 1997 ¹	Diet & Chronic Disease Prevention WHO/FAO, 2003 ²	Dietary Guidelines for Americans USDA/DHHS, 2005 ³
Fruits and vegetables	Select mostly plant-based diet. = 5 servings fruits & vegetables	At least 400g	Sufficient fiber-rich fruits & vegetables from all 5 groups
Meat, Poultry & Fish	Limit red meat to <3oz./d & <10% energy. Choose fish & lean poultry	No specific recommendation	Select lean meat, poultry, fish
Milk & Milk Products	No specific recommendation	No specific recommendation	= 3 cups fat-free or low-fat milk or milk products
Fats, Oils & Fatty Foods	15-30% ^a . Limit fatty foods & oils, especially of animal origin	15-30%; < 10% SFA 6-10%PUFA ^b ; < 1% Trans fats; <300 mg cholesterol/d	Limit fats & oils to 25-30% ; < 10% SFA <300 mg cholesterol. Trans fats as low as possible
Carbohydrates (% total energy minus protein and fat)	45-65% energy = 7 servings minimally processed grains, legumes	55-75% energy especially from whole grains (remaining 10-15% from protein)	= 3 whole grain servings; also consume dry beans
Total dietary fiber	38g and 25g for men and women = 50 years	> 25g preferably from whole grain foods	Choose fiber-rich foods
Free sugars	Limit consumption	< 10% ^c	Limit added sugar & caloric sweeteners
Alcoholic Beverages –if consumed	Not recommended. Limit to 1 drink for women & 2 for men	No specific recommendation	Limit to 1 drink for women; 2 for men. Avoid during pregnancy & lactation
Sodium chloride	<6 g. Limit salted foods	5 to 6 g (iodized)	< 2300 mg sodium (~1 tsp)
Dietary Supplements	Probably unnecessary, possibly unhelpful for reducing cancer risk	No specific recommendation	No specific recommendation
Food Hygiene, Cooking & Storage	Refrigerate perishable food; avoid eating contaminated food; Avoid charring foods	No specific recommendation	Practice good food hygiene. Avoid consuming raw or undercooked meat, poultry, eggs & dairy foods.
Body Weight	BMI 18.5-25. Limit weight gain in adulthood to 11 lbs.	Avoid obesity. BMI 18.5-24.9. Limit lifetime weight gain to 11 lbs.	Balance caloric intake and expenditure; prevent weight gain through exercise
Physical activity of moderate intensity ^d	60 min. brisk walk daily; =60 minutes vigorous activity/week	At least 30, pref. 60, minutes daily	30-90 minutes moderate-vigorous activity several times/week

¹ World Cancer Research Fund/American Institute for Cancer Research: Food, Nutrition and the Prevention of Cancer, Washington, DC 1997; ² World Health Organization: Diet, Nutrition And The Prevention Of Chronic Diseases. Report of a Joint FAO/WHO Expert Consultation. WHO Technical report Series 916. WHO, Geneva, 2003; ³ USDA/DHHS: Dietary Guidelines for Americans 2005. Government Printing Office, Washington, DC, 2005. ^a Percentages refer to proportion of total daily energy consumed.; SFA=saturated fats. ^b 1-2% of the PUFAs as n-3 PUFA.; ^c All added monosaccharides and disaccharides, plus sugars naturally present in honey, syrups and fruit juices ^d Recommended duration varies with focus: cardiovascular risk reduction or weight reduction.

CECheck-Up

The influence of diet and nutrition on cancer causation and prevention has been at the center of nutrition and health controversy at least since 1980, when the National Academy of Sciences issued a landmark report culminating in dietary recommendations to lower cancer risk. Over the past two decades, several other authoritative organizations, including the U.S. National Cancer Institute, the World Health Organization (WHO) and the American Institute for Cancer

Research, have followed with updated reviews of the evidence, accompanied by dietary guidelines. Essentially, these reports point to the complex and tentative state of knowledge on this topic. The summer 2006 issue of the *MONITOR* is devoted to summarizing this knowledge, and to examining dietary and public health policy guidelines to lower cancer risk.

In the lead article, Dr. Laurence Kolonel from the Cancer Research Center of Hawaii provides an overview of

the evidence on diet and cancer, highlighting the benefits of a high intake of fruits and vegetables, as well as the general consensus among authorities on dietary guidance to reduce cancer risk.

In the *Insider's View*, Junshi Chen of the Institute of Nutrition and Food Safety in Beijing points to increasing mortality from diet-related cancers in China, perhaps because of the increasingly apparent transition to a high-fat, low-fiber diet and a rise in obesity rates among the Chinese.

Features author Suzanne Murphy from the Cancer Research Center of Hawaii presents an analysis of research on dietary supplements and cancer, concluding that the evidence of benefits is meager and high-dose supplementations do pose some health risks.

In *Policy Beat*, Colin Tukuitonga of WHO provides insight into the development of WHO's 2004 Global Strategy on Diet, Physical Activity and Health, emphasizing the roles and importance of various stakeholders in implementing this comprehensive set of policy options.

Finally, *CECHE News* reports on the progress of two of CECHÉ's collaborative programs: a dietary approach to cardiovascular disease prevention, led by the Center for Science in the Public Interest; and the impact of "Orange Health-e," an electronic newsletter



developed for campus-wide health education at Syracuse University in collaboration with the institution's Newhouse School for Public Communications.

Based on our experts' discussions and international data, it is apparent that the complexity of diet and its relationship to cancer will continue to pose a challenge to researchers, policy-makers and the general public for some time to come!

Sushma Palmer, D.Sc.
Chairman, CECHÉ

Insider's View

Has the Rapid Dietary Transition in China Affected Cancer Risks in the Population?

by Junshi Chen, Ph.D.; Institute of Nutrition and Food Safety, Chinese Center for Disease Control and Prevention, Beijing

The status of diet and nutrition among both urban and rural Chinese populations has improved significantly in the last two decades, and the prevalence of malnutrition and nutritional deficiency has continually declined. Meanwhile, the prevalence of non-communicable chronic diseases, including cancer, has rapidly increased.

Are recent changes in Chinese diet and nutrition related to this surge in chronic disease, and specifically in cancer mortality?

Changes in Diet Affect Body Weight

During the past 20 years, the dietary changes among the Chinese people include increased consumption of animal products and fat/oil, and decreased intake of cereal grains, coupled with a rise in the use of highly refined rice and wheat flour (See Table).

Between 1982 and 2002 (the most recent year for available national exposure data), fat intake increased from 68.3 to 85.6 g/person/day in urban populations and from 39.6 to 72.6 g/person/day in rural populations. As a consequence, the contribution of fat to the total energy intake rose from 25 to 35 percent in urban populations and from 14 to 28 percent in rural populations. During the same period, the contribution of cereal to the total dietary energy decreased from 70 to 47 percent in urban populations and from 80 to 61 percent in rural populations. While the average Chinese diet remains plant food-based, with cereals as a staple (366 and 415 g/person/day in urban and rural populations, respectively) and vegetable and fruit intake high (330 and

	Urban			Rural		
	1982	1992	2002	1982	1992	2002
Rice & Flour	435	388	350	394	445	389
Other Cereals	24	17	16	137	41	26
Tubers	66	46	32	228	108	56
Vegetable & Fruits	382	407	330	361	349	332
Meat & Poultry	62	100	104	22	38	70
Fish & Shrimp	22	44	45	7	19	24
Vegetable Oil	21	32	40	9	17	30

g/person/day

332 g/person/day in urban and rural populations, respectively), Westernization of the dietary pattern is clear.

One of the most striking and obvious health outcomes of these dietary changes is the increase in overweight and obese people in China. The percentages of overweight (BMI ≥ 24) and obesity (BMI ≥ 28) in the total population increased from 12.8 and 3.1 percent, respectively, in 1992, to 17.5 and 5.7 percent in 2002. Although these BMIs are lower than those in Western countries, if one considers only adults in large Chinese

cities, the prevalence of overweight and obesity has reached 30.0 and 12.3 percent, respectively. And the numbers are continuing to increase steadily. Meanwhile, obesity is known to adversely affect the risk for several chronic diseases, including several forms of cancer.

Dietary Changes Have Shifted the National Disease Burden

Along with these changes in dietary patterns and other lifestyle factors, such as increased rates of smoking and decreased physical activity precipitated by the explosion of the automobile and urban work methods, the disease pattern of the Chinese people is in transition, moving from communicable to non-communicable diseases, including cancer, at breakneck pace.

At present, non-communicable diseases account for about 70 percent of total deaths in China. Meanwhile, according to the most recent nationwide disease surveillance data collected from 145 sites, from 1991-2000, the age-adjusted mortality for total cancer in China increased by 24 to 26 percent, from 114 to 144 per 100,000 population in males and 67 to 83 in females. A 50 percent increase in lung cancer mortality (from 22.7 to 33.9 per 100,000 persons) during this time was due mainly to the delayed effects of cigarette smoking. (Both number of smokers and cigarette usage among smokers were up.)

Mortality from several diet-related cancers also increased. For example, the age-adjusted death rate for colon cancer rose 15 percent in males (from 5.4 to 6.2 per 100,000 persons) and 10 percent in females (from 4.4 to 4.8 per 100,000 persons), and that of breast cancer in females climbed 29 percent, from 3.1 to 4.0 per 100,000 persons from 1991-2000. It is hypothesized that these increases in colon and breast cancer are related to the dietary changes and weight gains noted above.

Esophageal and stomach cancers continue to be the major cancers in China, accounting for about half of total cancer deaths. However, studies in high-risk areas for

esophageal cancer (e.g. Linzhou, Henan province) have shown that, although overall esophageal cancer mortality did not change significantly over the last decade, it decreased among younger age groups. Experts hypothesize that this change was related to improvements in local diet as part of the rapid economic development and corresponding transition from a monotonous, deficient diet to a more varied, micronutrient-rich one that affected younger people in particular. This is supported by the observation that esophageal cancer mortality in older age groups in the same area has stabilized. In contrast, mortality for stomach cancer has remained stable or showed a slight increase, presumably because the major risk factors for this cancer, including a high infection rate with the stomach/intestinal bacterium *Helicobacter pylori* and a high salt intake, did not change.

Commitment to Cancer Control Unclear

Although improvements in cancer diagnosis may have contributed to the increase in cancer mortality in China during this past decade, it is unlikely that this alone would account for the 24 to 26 percent rise in total cancer mortality within the 10-year period. Dietary changes represented by the increased consumption of animal foods and oils, and decreased consumption of cereals are likely to have played a major role in the striking overall upsurge.

With this in mind, in 2004, the Ministry of Health promulgated a Five-Year Plan for the Control of Cancer in China, emphasizing balanced diet, moderate drinking and tobacco control as major preventive measures. Since no national death registration system exists in China, another national retrospective survey on cancer mortality is planned, and will commence later this year. Nevertheless, an overall commitment to combat this public health problem is lacking, as compared with the control of infectious diseases, which still receives the lion's share of government attention and resources.

Features

Dietary Supplements: Do They Lower—or Raise—the Risk of Cancer?

by Suzanne P. Murphy, Ph.D., R.D., Researcher, Cancer Research Center of Hawaii, Honolulu

More than half of the U.S. adult population takes some type of dietary supplement. In fact, in 2005, this growing constituency spent about \$23 billion on such products.

Choosing a supplement today is no small task. Most supplements contain one or more essential vitamins and minerals. Some contain compounds found in foods that are not considered nutrients, such as isoflavonoids (from soy products), while others contain herbal and botanical compounds not normally found in foods (such as saw palmetto or ginseng). Increasingly, dietary supplements contain combinations of many different compounds. Furthermore, the line between a food and a dietary supplement has become blurred, because compounds found



Supplements often deliver levels of nutrients that greatly exceed the RDAs, despite the lack of convincing evidence that high levels of supplements benefit overall health or reduce cancer risk.

primarily only in dietary supplements are now being added to foods (e.g., ginseng in beverages), while foods can appear on the market as pills or capsules (e.g., dried cranberry powder). Some dietary supplements provide nutrients at approximately the recommended daily level (following guidelines such as the Recommended Dietary Allowance (RDA) or Daily Values), while other supplements provide much higher levels, often beyond those obtainable from food alone. In many countries, bottle labels provide information on the percent of the recommended nutrient intake that is supplied by a dose of the supplement (see image).

Do Supplements Protect Against Cancer?

Dietary supplements might protect against cancer by providing essential nutrients that are low in a typical diet. (Nutrient intakes that are below requirements eventually lead to deficiency diseases, and are also likely to be associated with a higher risk of chronic diseases such as cancer.) For example, a 1986-1991 study in a poorly nourished population in China found that both new cases of cancer, as well as deaths from cancer, were reduced in those who received supplements containing the antioxidants vitamin E, beta-carotene and selenium at one to two times the daily recommended level. Thus, individuals with diets that are low in antioxidants might benefit from dietary supplements that provide these nutrients.

Many dietary supplements deliver levels of nutrients that greatly exceed the RDAs, often at levels not possible to achieve with food alone. Many studies in different parts of the world have addressed the question of whether high levels of supplements can reduce cancer risk in relatively well-nourished populations. Observational studies that have looked at cancer risk among people who chose to use dietary supplements have sometimes found significant associations, but many of these associations have not been supported by placebo-controlled randomized trials. The observational studies may be misleading because, as is well-known, people who choose to use supplements generally have healthier behaviors (such as better diets and lower body weights) than those who do not use supplements, and these confounding factors may contribute to their lower risk of cancer.

Results from randomized trials to date do not provide conclusive evidence about the efficacy of dietary supplements. From 1985-1993, one of the few trials showing a positive effect of supplements found a decreased risk of prostate cancer (and, possibly, of colon cancer) among male smokers who were given 50 mg of vitamin E per day (about three times the RDA). However, several other high-dose vitamin E trials did not demonstrate a

reduction in cancer risk, or in total mortality. Three studies have demonstrated a protective effect of selenium supplements for certain cancers, but the studies have several flaws and the results are inconclusive. In a 1994-2002 study in France, a combination of several antioxidants (vitamin C, vitamin E, beta-carotene, selenium and zinc) at about twice the RDAs reduced the overall risk of cancer in men, but not in women. An ongoing trial in the United States, Puerto Rico and Canada of the effect of selenium and vitamin E supplementation on prostate cancer may allow stronger conclusions about supplements of these two nutrients, at least for this particular cancer site.

Do Supplements Increase Cancer Risk?

Most nutrients have the potential to cause toxicity if taken at high enough levels, which raises concerns about the amounts of nutrients that can easily be obtained from dietary supplements. Several randomized studies seem to point to possible risks of taking high levels of dietary supplements, including an increased risk of cancer. Perhaps best-known is a study of beta-carotene and lung cancer among smokers, conducted from 1985-1993 in Finland. In an unexpected finding, smokers who received beta-carotene had a higher risk of lung cancer. The same phenomenon occurred in a similar 1989-1996 study of smokers and asbestos workers in the United States. Other studies involving non-smokers have found no effect of beta-carotene on cancer risk. In the above-mentioned antioxidant study in France, the risk of prostate cancer was reduced in men with a normal baseline prostate-specific antigen (PSA) but increased in those with an elevated baseline PSA. These studies have increased awareness of possible adverse effects of dietary supplements, at least for some segments of the population.

The Bottom Line

In spite of the wide popularity of dietary supplements, there have been few well-designed studies to date that document their effectiveness in reducing the risk of cancer. Furthermore, there is concern about possible adverse effects, particularly at intake levels that exceed the RDAs. More systematic studies of the risks and benefits are clearly needed.

In May 2006, a panel convened by the National Institutes of Health in the United States concluded, "The present evidence is insufficient to recommend either for or against the use of multivitamin/mineral supplements by the American public to prevent chronic disease."

CECHE Supports CSPI'S Advocacy For Healthy Hearts

by Michael Jacobson, Ph.D., Director, Center for Science in the Public Interest, Washington, D.C.

Cardiovascular disease (CVD) is the leading cause of death in the United States. Although mortality rates for coronary heart disease and stroke have declined, some 650,000 will still die this year from these two types of CVD. Meanwhile, catheterizations, angioplasties, bypasses and other CVD-related medical procedures not only set Americans back \$60 billion, but they also kill 30,000 people a year. Statins and other CVD medications cost an additional \$30 billion a year.

The federal government's response to this health crisis is disappointing. While the National Heart, Lung, and Blood Institute (NHLBI), a unit of the National Institutes of Health, offers strong advice about the importance of diet and exercise as a means of both preventing and treating heart disease and stroke, U.S. regulatory agencies have done little to reduce CVD rates. Equally frustrating is industry's reluctance to proactively make its products as healthful as possible.

While numerous factors cause CVD, including genetic disposition, level of exercise and stress, the Center for Science in the Public Interest (CSPI) has identified three dietary elements – trans fat, saturated fat and sodium – whose reduction or elimination from the food supply offers the quickest, most affordable path to CVD prevention. In addition, the consumption of fruits, vegetables and whole grains should be increased to further reduce disease rates.

With CECHÉ support, CSPI is working with CVD experts to advocate policy changes to reduce this deadly disease, including a ban of trans fat in the American food supply and a reduction in the level of sodium in prepared and processed foods.

Trans Fat (from partially hydrogenated vegetable oil) Is Risky

Until around 1990, trans fat was considered as innocuous as other monounsaturated fats (such as those found in olive oil). Then studies demonstrated that trans fat, like saturated fat, increases the "bad" (LDL) cholesterol in blood, and, uniquely, decreases the "good" (HDL) cholesterol, both of which increase the risk of heart disease.

In a July 2002 report, the National Academy of Sciences' Institute of Medicine concluded that people should consume as little trans fat as possible. In January 2006, the Food and Drug Administration (FDA) mandated trans-fat labeling on Nutrition Facts labels on packaged foods, the result of a 10-year effort by CSPI.

As industry now scrambles to tout "0 Trans Fat" on its products and find new oils to replace the old, CECHÉ supports CSPI's efforts to press for a full ban of trans fat. Toward that end, in 2005, CSPI petitioned the FDA to limit trans fat to 2 percent of fat in foods, which is tantamount to a ban on partially hydrogenated vegetable oils. It also issued "Trans Fats – Going...Going," a report that details the findings of its survey on trans fat amounts in popular foods, and industry efforts to replace them with more salubrious oils.

In addition, CSPI has continued to pressure the food



A Broken McPromise

Trans fat causes tens of thousands of heart-disease deaths each year. So why did McDonald's break its promise to eliminate trans fat from its cooking oil?

and restaurant industries to voluntarily switch to liquid oils like canola, soy and corn, and to use as little butter, palm and coconut oil as possible. Among the notable changes, Frito-Lay has stopped using partially hydrogenated oils in most of its products; Kraft and ConAgra have reduced levels of or eliminated trans fat in their products; and many smaller companies are doing the same. Even Crisco shortening, the quintessential partially hydrogenated fat, now comes in a trans-free version. To support its mission, in 2005, CSPI also launched an interactive Web site, www.transfreeamerica.com, a valuable resource on trans fat that features a petition drive and e-activism campaign.

Meanwhile, this year, CSPI released the results of its tests on the trans fat content in frying oils used in 20 leading hospitals and several government agencies. The results: Many cafeterias, including the one at the U.S. Department of Agriculture, were frying foods in partially hydrogenated oils. Some of the hospitals and the agriculture department immediately changed their oils, and both reports have been widely quoted in the media and now stimulate discussion in key policy arenas.

Too Much Sodium Is Dangerous

Found in every U.S. kitchen, restaurant and food-production facility, salt may well be the most dangerous food ingredient of all. Eating too much salt raises blood pressure, which increases the risk of heart attack and stroke.

Beginning 25 years ago, CSPI pressured the FDA to require better labeling of sodium. But even with labeling now on all food packages, sodium consumption remains at a dangerously high level.

The FDA's daily recommendation for sodium intake is 2,400 milligrams (mg). Recently, the National Academy of Sciences significantly lowered that recommendation to 1,500 mg a day for people who have, or are at risk for, hypertension. Yet, according to government

surveys, sodium intake rose from about 2,800 mg per day in 1980 to about 3,000 mg in 1990 to 3,300 mg in 2000. (And those surveys do not even consider what Americans consume daily via the salt shaker.)

In 2004, the director of the NHLBI, Dr. Claude Lenfant, and two colleagues estimated that halving the sodium content of restaurant and processed foods would save 150,000 lives per year. In addition, tens of thousands of individuals would avoid nonfatal but debilitating strokes and heart attacks, and millions could discard their high blood pressure pills.

To support sodium reduction, earlier this year, CSPI released “Salt – the Forgotten Killer,” a report that identifies trends in sodium consumption, underlines the high levels of sodium in processed foods and restaurant meals, and makes policy recommendations designed to reduce Americans’ sodium intake. It also released “Salt Assault,” which compares the salt content of popular processed foods, revealing that some manufacturers are loading up their products with two, three or even four times as much salt as their competitors within a food category; the report served as the basis for a major *Wall Street Journal* article. In

addition, CSPI is attempting to persuade members of Congress to commission a study of the FDA’s and USDA’s handling of salt over the past 25 years, and to consider further regulatory or legislative action.

Future Prospects

In the coming months, CSPI will continue to press policy-makers to adopt sensible approaches to reducing sodium levels and protecting the public’s health. It will also hold press conferences and briefings to educate the public and decision makers about the harmfulness of a high-sodium diet.

Meanwhile, given sufficient funding, on a broader level, the CSPI-CECHE healthy heart project expects to enhance its CVD efforts and reach through physician networks; pressing Congress to correct governmental failures to lower sodium content in foods; investigating labeling initiatives to support consumer interests; and assessing recommended diets by the nation’s leading heart-disease prevention advocates.

Healthy Campus Initiative Takes Forward Strides

by Fiona Chew, Ph.D., Professor, S.I. Newhouse School of Public Communications, Syracuse University, Syracuse, N.Y.

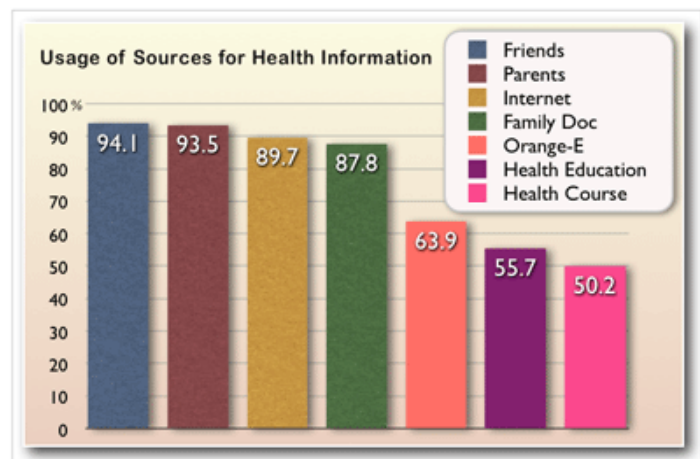
In spring 2005, Syracuse University’s Health Services launched “Orange Health-E,” an electronic newsletter intended to provide students with preventive health advice and healthy tips about nutrition, exercise and risky-behavior avoidance.

From April 6 through May 10, 2005, the S.I. Newhouse School of Public Communications, with support from CECH, conducted an electronic survey among 6,000 randomly selected students to assess the usage and helpfulness of this new health-promotion newsletter. A total of 301 responses were obtained, yielding a response rate of 5 percent. Demographics showed that the sample contained proportionately more females and graduate students than the actual student population.

Highlights of the 2005 survey revealed that friends were the most widely used source of health information, closely followed by parents and the Internet. Nine out of 10 students also rated both their parents and the Internet 7.2 on a 1-10 helpfulness scale. The next most helpful source of health information was health-focused coursework, but this involved only 43.8 percent of the students. At the time of the fieldwork, the electronic newsletter, which had just been launched, was rated 4.8 on helpfulness and used by 43.4 percent of the students.

This spring, a follow-up survey was conducted from April 4 through April 25 among 4,000 randomly selected students. A total of 323 responses were obtained, yielding a response rate of 8.1 percent. As in the first survey, the respondent sample skewed female and included more graduate students than the actual student body.

This time around, parents were rated as the most helpful source of health information, with nine out of 10



students rating their parents 7.0 on a 1-10 helpfulness scale. Parents were also one of the most widely used health information sources, tapped by 93.5 percent of respondents. Family doctors also received a 7.0 helpfulness rating and were used by 87.8 percent of the respondents. The third most helpful source of health information (6.7 helpfulness mean) was the Internet, followed by health-focused coursework (6.2 helpfulness mean), which was used by 50.2 percent of the students, an almost 7 percentage-point increase from the 2005 survey results.

The electronic newsletter increased its helpfulness rating to 5.9 and its usage among respondents rose to 63.9 percent, a more than 20 percentage-point increase, and proof that “Orange Health-E” is broadening its reach and becoming more effective in serving the student population.

WHO Strategy on Diet, Physical Activity and Health Targets Global Chronic-Disease Burden

by Colin Tukuitonga, M.P.H., Noncommunicable Disease Research Coordinator, World Health Organization, Geneva

Chronic, noncommunicable diseases, such as cancers, heart disease and diabetes, are currently the leading causes of death, disability and disease worldwide, except in sub-Saharan Africa. They account for about 60 percent of all deaths and 47 percent of the global burden of disease, with 66 percent of the deaths attributed to noncommunicable diseases occurring in developing countries, usually among younger people than in developed countries.

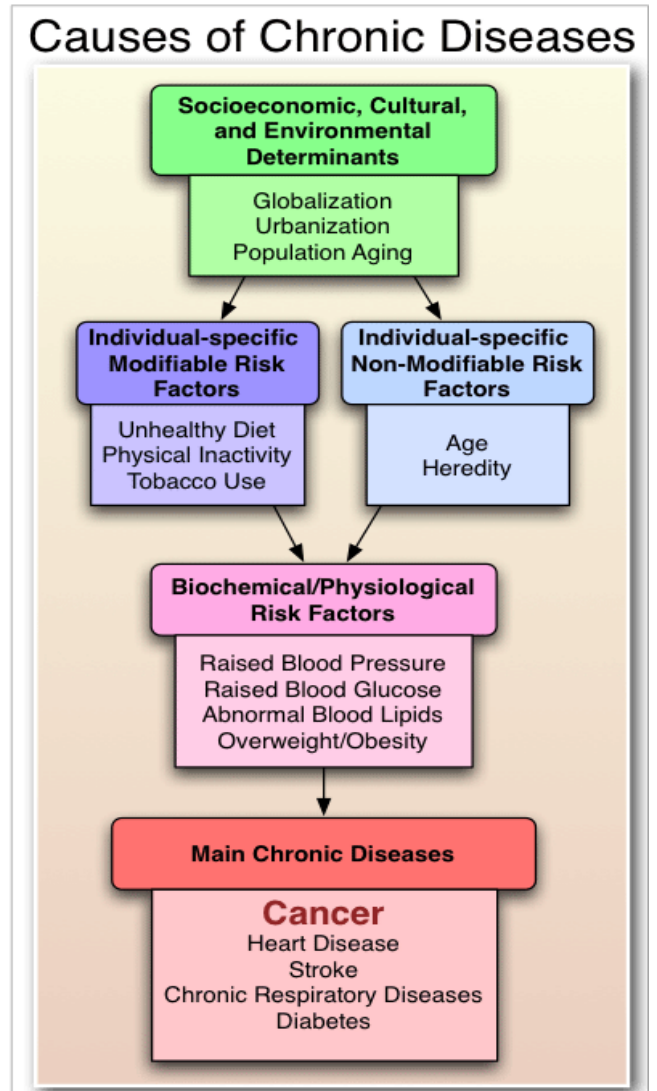
The World Health Organization (WHO) projects that the global epidemic of chronic diseases and their common risk factors will escalate and worsen, leading to 73 percent of all deaths and 60 percent of the global disease burden respectively by 2020, unless decisive, effective actions are taken at international, regional, national and local levels. An international public health policy instrument could contribute significantly to the prevention and reduction in the risk of selected cancers and other chronic diseases by improving national dietary (and physical activity) practices.

An International Policy Framework

In response to this challenge, the World Health Assembly (WHA) developed and adopted the WHO Global Strategy on Diet, Physical Activity and Health (DPAS) in May 2004. (WHO does not have a separate strategy for diet, physical activity and cancer prevention since DPAS addresses two of the major risk factors common to cancers, heart disease and other chronic diseases.)

DPAS builds upon several prior WHA policy statements such as the 2003 WHO/Food and Agriculture Organization (FAO) report on diet, nutrition and the prevention of chronic diseases, in addition to agreements and declarations made at the regional level of WHO. A comprehensive set of policy options, DPAS calls upon all stakeholders – governments, educators, nongovernmental organizations (NGOs) and the private sector – to take action. Governments have a central leadership and stewardship role in shaping national public health policies, including national food availability, affordability and quality. DPAS calls on governments to develop, implement and evaluate actions appropriate to national circumstances that promote individual and population health through improved diets and increased physical activity to reduce the risks and incidence of chronic diseases, including cancer.

Within a multisectoral national framework, ministries of health have responsibility to convene, coordinate and facilitate active participation of other agencies and stakeholders. Ministries and institutions that should contribute include those responsible for policies on food, agriculture, youth, recreation, sports, education, commerce and industry, finance, transportation, media and communications, social affairs, local government, and environmental and urban planning.



DPAS also calls on civil society and NGOs to inform and influence individual and community behaviours, and monitor the activities of governments, the private sector, and organizations and institutions that are involved in promoting healthy diets. NGOs can also help to ensure that governments provide support for healthy lifestyles, and that the food industry provides healthier products and better information about these products.

In addition, as responsible employers, manufacturers of food and drink products, providers of information and advocates for healthy lifestyles, the private sector, including the food industry, retailers, catering companies, sporting-goods manufacturers, advertising and

recreation businesses, pharmaceutical companies and the media, all have important roles to play in preventing and reducing the risk of chronic disease. Because many companies operate globally, international collaboration is crucial. Initiatives by the food and drink industries to reduce the fat, sugar and salt content of processed foods and introduce innovative and nutritious food choices could significantly improve the quality of food available in the market place.

National Food and Nutrition Action Plans and Dietary Guidelines

DPAS recommends that nations develop and implement their own national food-based dietary guidelines as interventions for the prevention of cancers and other chronic diseases.

National food and nutrition action plans and Food Based Dietary Guidelines are available and promoted in many countries by WHO and FAO. These guidelines provide evidence-based recommendations for improving national diets, including advice on measures to reduce cancer risk (e.g. increase consumption of fruits and vegetables), as well as actions to discourage practices which heighten cancer risk (e.g. reduce consumption of red or preserved meat). Dietary and nutritional interventions are more likely to be effective if the public policy agenda includes supportive actions by all relevant sectors such as agriculture and education.

Implications for Global and Regional Food Policies

International trade in food is a substantial global economic activity constituting 11 percent of global trade, thereby exceeding international trade in fuel, according to a 2001 article by Pinstrep-Andersen and Babinard. Processed foods in developed countries are produced by only a few transnational corporations. Much of this food is high in salt, sugar and fat, is actively marketed globally, and comprises predominantly energy-dense nutrient-poor (EDNP) items; there is little promotion of healthy foods. Partly in response to the adoption of DPAS, however, several large global food and beverage manufacturers are beginning to change the composition of some products and/or introduce healthier options.

While most of the food consumed in developing countries is grown or produced locally, processed foods are becoming increasingly popular, partly because they are often cheaper than locally produced foods. Developing countries already face growing challenges to limit the exposure of populations to EDNP foods as these nations begin to manage the dual burden of sharing the chronic diseases of

developed countries, while struggling to bring hunger and malnutrition under control.

Concerned by the rising levels of chronic diseases worldwide, parents and public health groups argue that voluntary and self-regulatory actions to limit the promotion and consumption of EDNP foods are inadequate and that national legislative interventions and international action are needed to stem the tide. This grassroots outcry, coupled with the growing role of public health issues in investment decisions, may help to encourage food and beverage manufacturers to continue to improve their product portfolio.

Challenges of Implementation

Implementation of DPAS at the global level presents major challenges, primarily due to the lack of appreciation of the social and economic costs of chronic diseases on individuals, families and nations, as revealed in a 2006 WHO report. Political commitment to the prevention of chronic diseases and their risk factors at all levels is a low priority. For example, in a recent assessment by WHO, less than half of its member states have implemented or plan to implement DPAS recommendations. Furthermore, some of the interventions proposed by DPAS conflict with the interests of stakeholders, such as the food and non-alcoholic beverage industries and advertisers. Recommendations to reduce salt, sugar and fats have been met with some resistance. Activities promoting healthy diets should therefore use a multi-stakeholder approach, be culture-specific, include information about energy balance, and emphasize the importance of physical activity.

New and innovative solutions are needed to challenge the established roles of and relationships in the health sector. Crucial for improving national diets are effective partnerships between public and private sectors (especially food and non-alcoholic beverage industries) to ensure that affordable and healthy food choices are available. Such partnerships remain largely undeveloped because public health agencies are uncertain about the influence of the private sector on their standard-setting and regulatory roles.

National and international agricultural policies and guidelines must take note of public health rather than just food security and trade issues. For example, the agricultural sector needs to seriously promote increased production of fruits and vegetables instead of publicly bemoaning the production of sugar and animal-based products. A WHO/FAO workshop held in Rome in May 2006 underlined the need for agricultural policies to promote public health. Encouraging the production and consumption of locally produced and unprocessed foods will be an important part of this process – and a good start.