

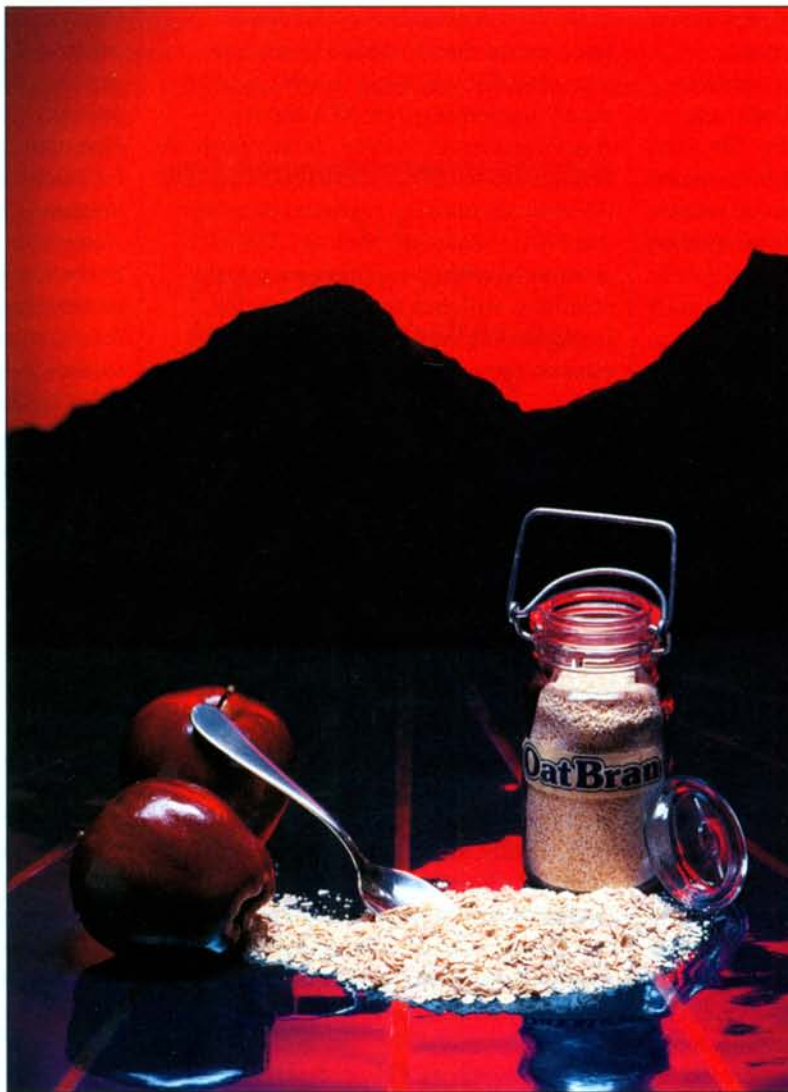
NATIONAL CANCER INSTITUTE STRATEGIES IN CANCER PREVENTION

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The National Cancer Institute's activities in five important areas—early detection, public education, and antismoking, dietary, and chemopreventive research—are discussed by the director of NCI's Division of Cancer Prevention and Control.

Nearly one million new cases of cancer are diagnosed in the United States each year, with 494,000 annual deaths attributed to this disease. The National Cancer Institute (NCI) has set a goal to improve cancer control and reduce U.S. cancer mortality by 50 percent by the year 2000. Ongoing interventions that promote dietary modifications to reduce cancer risk, prevent smoking, and advance screening methods for early detection, are a key part of that goal.

With the exception of smoking, dietary habits are the single most significant lifestyle factor in cancer risk.¹ The estimated 35 percent of cancer deaths that may be related to diet have stimulated an aggressive effort to explore the role of nutrition in cancer prevention. A large body of epidemiological evidence provides consistent support for a relationship between specific dietary components and the development of certain cancers, notably those of endocrine or digestive system origin (breast, prostate, colon, stomach). Vitamins A, C, and E, carotenoids, selenium, calcium, fiber, and a number of non-nutritive components are hypothesized to contribute alone, or in combination, to the apparent cancer-preventive effects of certain food groups identified in dietary recall studies. Both epidemiological and laboratory research



trients, and other active compounds that may inhibit cancer. Diet and cancer prevention research focuses on the influence of food groups (e.g., fat, the most clearly implicated dietary tumor promoter, and fiber, a possible inhibitor of tumor development). Chemoprevention research is directed toward identifying specific natural or synthetic chemical agents (e.g., retinoids, selenium, isothiocyanates, tamoxifen) that are biologically active as cancer preventives, to be developed for use in clinical prevention interventions. More than 1,000 chemopreventive compounds are under consideration for further development, with more than 75 currently being evaluated in the preclinical setting. Promising cancer-inhibiting agents are prioritized for testing in human intervention studies.

The NCI supports four types of prevention

identify high intakes of dietary fat as cancer promoting.²⁻⁵

Dietary Modification and Chemoprevention

A scientifically rigorous program at NCI, including diet and cancer and chemoprevention research, is designed to identify and characterize micronutrients, macronu-

trials aimed at reducing the incidence of cancer. These clinical interventions are meant to benefit the population at large (e.g., beta-carotene), individuals at very high risk (e.g., smokers exposed to asbestos), individuals with precancerous lesions (e.g., colon polyps), and individuals at high risk for cancer recurrence (e.g., breast cancer). More than 30 human intervention trials are currently supported by

NCI; some in collaboration with other countries. Results from these interventions will be available in the 1990s.

Dietary Guidelines

While the importance of diet and chemopreventive interventions in reducing cancer risk is being further established by current research, interim guidelines have been proposed by NCI and a number of scientific organizations.^{2,5,6} These guidelines recommend dietary modifications to increase consumption of fruits, vegetables, and whole grains, while decreasing fat intake, avoiding alcohol and frequent consumption of smoked and pickled foods, and maintaining a desirable weight. Thus the guidelines emphasize diets rich in cancer-inhibiting factors and recommend reducing factors that may be cancer promoting.

Biotechnology and the Changing Food Supply

In addition to the development of recommended dietary guidelines, the modification of foodstuffs through advances in food and agricultural science, including food and agricultural biotechnology, represents an important mechanism for promoting cancer reduction strategies. These advances are effecting changes in our food supply and may have profound effects on nutritional intake and long-term health.

A favorable development in the food industry, driven by consumer demand, is an emphasis on new product development. Recently developed fat substitutes, such as Simplese and Olestra, may reduce the percentage of fat in numerous oil-based and dairy products. Sharp reductions have been made in the total fat content of market livestock through breeding, genetic improvement, and the use of growth hormones. Genetic engineering applied to agriculture can also provide greater yields of high-quality fruits, vegetables, and grains with improved disease resistance, nutritional content, and other qualities that may increase consumption of foods that have possible cancer-preventing benefits.⁷

Smoking Prevention

Smoking and tobacco use have long been linked to lung cancer in hundreds of conclusive laboratory and epidemiological

studies. Lung cancer incidence can be prevented almost completely by eliminating this practice. Effective smoking prevention and cessation strategies targeted to the public at large and specific high-risk groups are being developed and tested at NCI.

NCI's Community Intervention Trial for Smoking Cessation (COMMIT), initiated by the Smoking, Tobacco, and Cancer Program, involves more than two million people in 22 communities in the United States and Canada in the testing of smoking cessation strategies delivered through organizations and social institutions. The American Stop Smoking Intervention Study (ASSIST) is a five-year plan that will begin in 1991, and be jointly implemented by NCI and the American Cancer Society. It will establish community-based demonstration efforts to disseminate smoking cessation programs that NCI evaluations, such as COMMIT, show to be effective. These community coalitions will then form the basis for implementing nationwide smoking and tobacco prevention programs.

Early Detection

Increased attention is being given to the early detection and screening of cancer, and when an available treatment may be most effective. Numerous national organizations, including NCI and the American Cancer Society, recommend increased use of mammography for breast cancer screening, as well as fecal occult blood testing and sigmoidoscopy for the screening of colorectal cancer, and Pap tests for cervical cancer screening. The NCI broadly disseminates early detection guidelines for skin, lung, cervical, colorectal, breast, testicular, prostate, and oral cavity cancers. These guidelines are reviewed periodically as new data become available.

Information Dissemination and Behavior Modification

Effective mechanisms for modifying behavior and transmitting information to clinicians, patients, and the public are recognized as effective means of cancer control and are an integral part of NCI's research strategy. Information channels include primary care health professionals (e.g., physicians and dentists), workplace programs, school programs, marketplace

programs, mass media, public health agencies, and NCI's Cancer Information Service (CIS) and Cancer Prevention Awareness Program. The CIS, by maintaining regional cancer information centers that are accessible through a national toll-free telephone number (1-800-4-CANCER), provides the most current information on all aspects of cancer to any interested individual.

Summary

Cancer rates for whites younger than 65 years of age show decreases for many common cancers, including colorectal (14 percent), bladder (29 percent), oral (17 percent), and cervical (38 percent), but disproportionate increases at certain sites for blacks and elderly persons, and increases or no improvement among women for lung and breast cancer, respectively. Antismoking, dietary, and chemopreventive intervention research; early detection; and public education are major focuses in cancer prevention and control at NCI. ■

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