

Diet/cancer recommendations debated

Controversy over diet/cancer link points up difficulties of formulating public policy guidelines from incomplete or uncertain research data

Jeffrey L. Fox
C&EN, Washington

The search for causes and the consequent efforts to develop preventive measures against cancer involve a wide range of experts—basic biologists, nutritionists, toxicologists, epidemiologists, clinicians, and policy planners, just to name a few of the influential participants. They are a fractious lot. Hence, their achievements, despite arising out of efforts directed at a common goal, often are presented piecemeal and sometimes are contradictory. The policy goals the experts recommend thus come across as being less than coherent.

Recent attempts to develop a policy on diet and cancer provide an example of the difficulties experienced when experts address this worthy goal. This limited, but by no means easy, project falls within a broader framework in which the issue of major causes and contributors to cancer incidence is being studied. That issue bears directly on diet. Yet, there has been little agreement—indeed, there often is outright disagreement—about which problems deserve emphasis, never mind which dangers demand immediate correction.

Within this context, an ad hoc committee of the National Research Council, which is part of the National Academy of Sciences in Washington, D.C., was set up to develop dietary recommendations to lower the risk of cancer in the U.S. (C&EN, June 21, page 4). The project was begun at the request of the National Cancer Institute, which itself formulated recommendations in 1979. Those recommendations, however, were based on a relatively quick survey of the scientific literature and also on hunches and personal judg-

ments of Arthur C. Upton, then head of NCI. NRC's charge was to develop guidelines based on a more thorough analysis of available data, including any recent studies, and to recommend areas for research.

The NRC committee has met the first part of its obligation by putting together a substantial report (more than 250 pages in length) and by issuing a set of "interim" guidelines that are remarkably similar to those issued by NCI a few years ago. A second report, establishing priorities for future dietary and cancer research, is expected to be completed in another year.

Essentially, the NRC report holds that most common cancers potentially are preventable since they are determined more by "habit, diet, and custom," rather than by genetic factors. However, "it is not now possi-

ble and may never be possible to specify a diet that protects all people against all forms of cancer," the report says.

Its goal, then, is to present guidelines for a diet "consistent with good nutritional practices and likely to reduce the risk of cancer." These guidelines call for a reduction in con-

NEWS ANALYSIS

sumption of fats from the present level of about 40% of the average person's caloric intake to about 30%. This means a reduction in the consumption of fatty cuts of meat, whole-milk dairy products, and cooking oils and fats. In addition, Amer-

Researchers closing in on basics of malignancy

Researchers studying cancer at the cellular level are growing increasingly confident that they're close to making fundamental and important discoveries about the nature of malignancy. That confidence stems from many convergent observations of the circumscribed set of genes found in some tumor-causing viruses and in certain malignant cells from animals.

Recently, researchers at several laboratories, including the National Institutes of Health in Bethesda, Md., Cold Spring Harbor Laboratory on Long Island in New York, Massachusetts Institute of Technology in Cambridge, and Harvard medical school in Boston, have mounted an enormous effort to understand how these genes are related, hoping to learn from that what they do to make normal cells become malignant. Last year, it still was an open question whether these two subsets of genes were truly related (C&EN, March 16, 1981, page 16). Now the scientists studying them believe the viral and animal-cell genes to be closely related, if not identical, in their detailed molecular structures.

These similarities also extend to genes found in some human cells—including cells that are considered normal as well as cells that are frankly malignant.

Most of these genes share the property of "transforming cells," that is, of changing the characteristic growth pattern of a normal cell to the uncontrolled growth typical of a cancer cell. Such genes exert this effect when introduced into test cells, usually a particular type of mouse cell.

Just how these genes transform cells remains a mystery. The genes do encode for a protein, which seems important for malignant transformation. In some instances, that protein is an active, membrane-associated "kinase," meaning it can transfer phosphoric acid residues from nucleotide phosphates (usually guanosine triphosphate) typically to itself or to other proteins. Whether such enzymic activity is crucial to transformation still is unknown, but seems likely.

An important conviction is that these genes are ubiquitous, and their activity in normal cells either is carefully modulated or nil. When moved about from one cell type to another, these genes can become activated—sometimes thanks to deliberate biochemical tinkering by scientists, and other times possibly just by being in another place. The exact way in which control over these genes is exerted, and how it's lost, could be pivotal to malignancy.

icans should eat more fruits, vegetables, and whole-grain cereal products, especially those rich in vitamin C and in carotene. Dietary supplements of individual nutrients found in these foods should be avoided, the committee cautions, because they may be toxic in high doses.

The guidelines also call for minimizing consumption of salt-cured, salt-pickled, and smoked foods, and limiting the consumption of alcohol, particularly by those who smoke, to moderate levels.

The NRC guidelines, mild and general though they may be, are eliciting much the same criticism as did their NCI predecessors. Those criticisms come from many different camps. Some must be taken as the obvious outcry of special interest groups who have something tangible at stake should NRC's suggestions become widely implemented. Those interest groups, including meat processors and distributors, naturally have the right to protect their turf. Yet, in matters affecting public health, surely even the special interest groups owe the experts a fair hearing.

For example, the American Meat Institute faults NRC for relying on studies that compare dietary habits of people in different countries. A similar organization, the National Meat Association, takes NRC to task for "taking a simplistic approach to a very complex question." The association also criticizes the "almost steady stream of contradictory statements coming from the scientific community," calling it "perplexing and confusing to the public."

Some defenders of NRC's efforts may discount such criticisms, no matter what their intrinsic validity might be; they judge them on the basis of who's issuing them. But criticisms also are emanating from within the scientific camp, even, ironically, from scientists who sit on other NAS committees and boards.

Over the long term, such pluralism probably is healthy in the search for truth. Meanwhile, though, it can be perplexing not only to the public, but also to the news media and to members of the scientific community who genuinely are interested in maintaining coherence in thought and purpose.

Robert E. Olson is a biochemist at St. Louis University school of medicine and a member of the NAS Food & Nutrition Board. He is critical of the recent NRC report as he has been a critic of past reports pertaining to diet and disease. "We



Grobstein: no cancer-free life

were accused of being too conservative," he tells C&EN, referring to a report on dietary influences on heart disease prepared by FNB two years ago. "This [NRC] report... is more flamboyant and liberal about changing diet. My feeling is the evidence linking diet to cancer is weaker than that for heart disease."

The problem of differences among scientists is very much a question of what evidence anyone considers acceptable. The NRC committee states in its report that scientifically valid data "are provided by three major sources: epidemiological studies on human populations; experimental studies on animals; and in-vitro tests for genetic toxicity." Critics, including Olson, simply don't agree with that premise. "I'm surprised, especially with [the committee's] use of epidemiologic research," he says, calling it "hardly proper" to apply such results toward making "sweeping" changes in diet. Thus he calls the report "premature" and says that any general recommendations about diet ought to be backed by data from clinical trials.

Olson's suggestion is sound from a scientific standpoint but undoubtedly impossible from a practical one. Many dietary effects on cancer are believed to be subtle—contributory rather than directly causative. The scope that would be needed to test, for example, whether reductions in fat intake affect cancer incidence goes way beyond the limits of most clinical trials.

The question of time is central to the disputes that develop over can-

cer policy. Olson, for instance, argues that, in most matters concerning public health policy, lack of speed may be a virtue. On one level, there is a risk that the public will be deceived into following new practices that will do them no good, he says. And at another level, adopting such practices might cause harm. Specifically, he says that reductions in intake of animal fat may deprive some people of needed nutrients, particularly people who are recovering from disease or children who are growing rapidly.

"This research is relatively young," says Clifford Grobstein, chairman of the NRC committee and professor of biology and public policy at the University of California, San Diego. "We have resisted overoptimistic statements... but recognized that we should try to put what we learn to use as soon as possible."

This notion—that new knowledge be used "soon" in formulating policies—represents a fundamental point of difference between groups within the scientific community. It also is perhaps the most crucial difference underlying the two reports issued by FNB and NRC.

Oddly enough, for all the criticism it is drawing, the NRC report is hardly a radical document. Urging people to eat more fresh fruit, vegetables, and whole grains—welcome though such recommendations may be—is not all that different from what children are told in U.S. schools. And cutting back on fat intake, a virtue touted indirectly by clothing designers, also is by now common wisdom that is transmitted by way of the medical community. Ironically, no one seems to question the right of family doctors to tell their otherwise healthy patients to shed extra weight by cutting back on dietary fats.

NRC's study—the result of a careful weighing of dozens, perhaps hundreds, of published studies—certainly deserves to have some impact, especially when measured against its formidable competitor, the many advertising devices affecting what people eat. It would seem peculiar simply to ignore—or worse, dismiss—the compilation of so many carefully executed studies while deferring whole hog to the endless entreatments from commercial advertisements to buy and consume all manner of foods. The scientists whose interests reside solely in improving public health can't remain silent indefinitely against that din in hopes that someday scientific certainty will arrive.