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EDITORIAL

Adequate Supplies of Fruits and Vegetables

The public has become increasingly aware that a diet that includes four or five fruits or vegetables per day substantially reduces the incidence of many types of cancers. At present, supplies of these foods are abundant and relatively inexpensive. But continuation of trends in the cancellation (banning) of fungicides could lead to food scarcities. An increase in the contamination of foods by fungal products that include carcinogens and nerve, liver, and kidney poisons would also follow. Moreover, in the absence of protective fungicides, plants in self-defense create phytoalexins, some of which are toxic to humans and induce carcinomas in rodents.

An immediate cause for concern is the content of a Consent Decree dated 20 September 1994 in which the Environmental Protection Agency is a participant. Implementation of the Consent Decree is being challenged by six food protection and processing organizations. However, the Delaney Clause is involved, and as long as that proviso stands, the Consent Decree is likely to be implemented. In that event, many of the most effective fungicides would ultimately be banned by the Environmental Protection Agency.

Fruits and vegetables are subject to attack by pests that include hundreds of species of fungi. If the number of permissible fungicides is reduced so that few are available, fungi will destroy crops. Were synthetic fungicides not available, experts have said that production of apples would be reduced 40%; grapes, 33%; peaches, 49%, and strawberries, 38%. Production of most vegetables also would be decreased. Prices would rise. Low-income people would be victims.

The cost and effort involved in creating new pesticides is so substantial as to inhibit development of new fungicides. Producers of agricultural chemicals have synthesized and tested tens of thousands of substances for possible use as herbicides, insecticides, or fungicides. These have been designed to interfere with metabolic pathways of the pests that differ from those of humans. A candidate commercial product is subjected to a battery of about 100 different tests, requiring a time span of as much as 9 years, and costing $50 to $100 million. Only a small fraction of substances meet requirements. The sales of fungicides are so limited that few if any new ones are likely to become available.

Implementation of the Consent Decree mentioned above would result in eventual cancellation of many chemicals because they can be shown to induce cancer in one strain and one sex of a rodent when huge, nearly lethal doses are administered. An example is the important, widely used fungicide captan. Under the Consent Decree, distribution of this substance is slated eventually to cease. Captan is relatively nontoxic. It is rarely detected on produce or in ground water. It is readily decomposed. However, when incorporated in the diet of cancer-prone $B_6C_3F_1$ mice at the level of 16 million parts per billion, duodenal carcinomas were found in 3 of 46 male mice and 3 of 48 female mice. When the dose was halved, only one carcinoma was found in a male and none in 49 females.* The evidence suggests a threshold for carcinomas, but this was disregarded. On the basis of the occurrence of a few benign tumors, captan was regulated as a carcinogen. During their lifetimes, the high-dose mice each ingested a quantity of captan greater than its total body weight.

Pesticides, including captan, are already highly regulated, and foods possibly containing them are monitored. Pesticides in most food samples are not detected by the Food and Drug Administration in spite of excellent oversight capabilities. Maximum concentration levels have been set on the basis of rodent experiments such that a person eating a food each day for 70 years would have one additional chance in 1 million of dying from cancer. This is to be compared to cancer deaths from other causes, which total 237,000 per million. Since each of the many steps in federal risk assessment usually exaggerates risks, the true probability of consumers dying of cancer because of synthetic pesticides is probably less than 0.01 per million. In any event, the benefits of fungicides in the production and distribution of health-enhancing fruits and vegetables should not be jeopardized by the folly of the Delaney Clause and actions of a regulation-proliferating agency.

Philip H. Abelson

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