

JUN 28 1982

DIET, WORKPLACE CALLED CANCER FACTORS

Saying that "most common cancers are *potentially preventable*," a National Research Council committee has begun recommending general dietary guidelines to reduce the risk of cancer. Despite their mildness and similarity to guidelines publicized by the National Cancer Institute two and a half years ago (C&EN, Oct. 15, 1979, page 20), the NRC committee's report has been criticized instantly.

In a separate but topically related development, epidemiologists who study cancer incidence are calling for "continued vigilance in the workplace and environment" to prevent cancer. They are acting on the basis of a recent analysis which, in part, contradicts another widely discussed epidemiologic study that played down the importance of such risk factors for cancer (C&EN, Aug. 17, 1981, page 32).

The National Research Council, the research arm of the National Academy of Sciences in Washington, D.C., was commissioned by the National Cancer Institute to prepare its report, "Diet, Nutrition, and Cancer." The ad hoc committee responsible for that report consisted of 13 scientists from the U.S. and Canada, including chairman Clifford Grobstein, professor of biological sciences and public policy at the University of California, San Diego.

The epidemiologists whose study

refers to the importance of the workplace and the environment include Devra Lee Davis, who recently moved to the Environmental Law Institute in Washington, D.C.; her former colleague at Johns Hopkins University in Baltimore, Kenneth Bridbord; and Marvin Schneiderman, a consultant with Clement Associates, also in Washington.

The principal trend to which Davis and her colleagues wish to direct scrutiny is that of increasing cancer deaths among older men in the U.S. These epidemiologists discern an increase in deaths due to cancer among men between the ages of 45 and 65 in the U.S. However, the trend is opposite for men below the age of 45, they note, with a drop in cancer mortality of about 40% since 1950.

Davis also draws attention to increases during the past several decades of the bulk manufacture of chemicals that are known to cause cancer in humans, including a doubling of "synthetic carcinogen production" in the past decade. Any effects of this increased manufacture on cancer incidence, either among workers or in the general populace, won't be known "until the end of the century," she says, adding: "Those who say we have no problem are jumping the gun." Thus she takes issue with a study published last year by British epidemiologists Richard Doll and Richard Peto. They

concluded that cigarette smoking could account for the only discernible general increase in cancer mortality. Davis says that chemical exposure, infectious disease incidence, and nutrition also must continue to be scrutinized.

A wide group of experts, including Doll and Peto, agree that nutritional factors probably play an important role in cancer. The NRC committee also agrees, but says "precise estimates of diet's contribution are not yet possible."

Nonetheless, says chairman Grobstein, "We recognize we should try to put what we learn to use as soon as possible. By controlling what we eat we may prevent such dietary cancers."

Thus the NRC committee has formulated rather mild and "interim" recommendations for the general population. These recommendations are explained carefully and qualified cautiously by the committee. The committee adds an even more general caveat: "It is not now possible, and may never be possible, to specify a diet that protects all people against all forms of cancer."

The critics of the committee's guidelines are arguing that it may not be possible to specify a diet that protects against any form of cancer. The most vehement critics perhaps are the meat suppliers. Representatives of the American Meat Institute and the National Meat Association, both headquartered in Washington, D.C., greeted visitors to the NRC press conference with statements offering instant criticism of the cancer-diet report.

That criticism also draws attention to inconsistencies within NRC, and in particular to the stance taken by NRC's Food & Nutrition Board two years ago regarding dietary guidelines (C&EN, June 2, 1980, page 6). Board member Robert E. Olson, a biochemist at St. Louis University school of medicine and a principal author of that FNB report, also is critical of the new NRC report, calling it "premature. My basic philosophy is don't make public health recommendations unless you're sure of a benefit," he says.

Grobstein defends the NRC report, saying: "I don't think we're pushing any unproven theories." □

Dietary guidelines may help reduce cancer risk

The Committee on Diet, Nutrition & Cancer of the National Research Council says the following guidelines are "consistent with good nutritional practices and likely to reduce the risk of cancer." Moreover, the guidelines ought to be followed in "their entirety" for maximum benefit.

- Consumption of fats should be reduced from the current level of about 40% to about 30% of total calories in the diet—"a moderate and practical target."

- The daily diet should include fruits, especially those rich in vitamin C; vegetables, particularly those rich in carotene and also members of the mustard family; and whole grains. However, taking of supplements of minor nutri-

ents found in these foods is not recommended, inasmuch as high doses are "potentially toxic."

- Foods cured or pickled with salt and smoked foods should be "minimized" in the diet.

- Contamination of foods with carcinogens "from any source" should continue to be minimized. "Intentional additives" should continue to be evaluated before approval for use in foods.

- Mutagens in foods should be identified and tested for their ability to cause cancer. Where "feasible and prudent," mutagens should be "removed" or their levels "minimized."

- Any drinking of alcohol, particularly by smokers, should be done "in moderation."

means of limiting exposure, arguing that it has been documented that personal protective equipment "is not less expensive."

Health Layoffs Interpreted

Interpreting the recent dismissals of four senior health officials by companies which he characterized as "not at the top of the heap in statesmanlike business operations," Corn argued that they were laid off because they simply attempted to respond to regulations rather than "selling" the positive gains of their programs.

"You can't build a program on responding to regulations, because when the regulations disappear, as they are now, the program does too," he said. "The aim should be long-term responsiveness to the health needs of workers."

Corn reported that more than 300 industrial hygienists applied for the some 50 job openings posted at the American Industrial Hygiene Conference, held earlier this month. With the economy in recession, he said, companies are not hiring, but the responsible ones "aren't firing, either."

Sheldon Samuels, safety and health director of the AFL-CIO Industrial Union Department, argued at the meeting that labor unions have demonstrated their commitment to worker protection by leaving their safety and health programs intact during general staff cutbacks prompted by the recession.

Labor unions now employ 65 permanent, full-time safety and health professionals, Samuels said, up from only four when he began in his position in 1971. None of these is in danger of being laid off, he stated. In addition, some 200 union safety and health positions are funded by OSHA New Directions and other government grants.

Labor-Management Committees

Samuels questioned the Reagan Administration's commitment to labor-management cooperation, contending that its withdrawal of the walkaround pay regulation and current efforts to limit worker access to company-held health data demonstrate an unwillingness to promote "two-way" cooperation.

"No labor-management committee can be successful without equal access to data and education and training [of committee members]," he asserted. "In a democratic society, you cannot have a mandated labor-management committee that preserves management prerogatives."

Neil V. Maresca, environmental health training coordinator for the International Lead Zinc Research Organization, Inc., also addressed this theme, maintaining that employers and workers must be trained in group problem-solving techniques if a labor-management committee is to be successful.

Describing his experience working with a St. Joe Lead Company/Lead Industries Association joint committee system at the company's Herculaneum Smelter, Maresca endorsed a "team approach" in which traditional adversarial relationships are gradually broken down. The project was funded by the U.S. Labor Department.

Remarking that "management is used to giving instructions," Maresca recommended that committee members "learn how to listen and how not to dictate solutions to a group." Projects that do not train members in group decisionmaking, he said, result either in "anarchy" or "revert to traditional adversarial relationships."

The greatest problem with worker attitudes is the potential for "apathy, negativism, and distrust of anything the company tries to do," the training specialist stated. Follow-up is important to counter these, Maresca argued, warning

that employees will lose faith if they do not see action taken on their suggestions.

Results also help to combat apathy, he said. In the St. Joe project, blood-lead levels, grievances, and absenteeism declined, while morale and productivity rose, he reported.

Publication Available

Announced at the seminar was the publication of a case study, *How OSHA Enforces the Law: The Effectiveness of the Occupational Safety and Health Administration in Protecting Workers in the Copper Smelting Industry*. Written by Sophie Weber, it includes commentaries by Corn of Johns Hopkins and Frank Goldsmith of the Cornell University School of Industrial and Labor Relations.

The report was published by the sponsors of the seminar, INFORM, Inc., a public policy research group that studies the impact of business activity on the environment, the workplace, and consumers. It grew out of a 1979 research project on safety and health in the copper smelting industry.

Copies of the OSHA enforcement study are available for \$15 from INFORM, 381 Park Ave. South, New York, N.Y. 10016; telephone (212) 689-4040. A full publications list may be requested, the group noted.

Carcinogens

STUDY FINDS RISE IN JOB-LINKED CANCER AMONG OLDER MEN; GREATER CAUTION URGED

Cancer deaths among men under 45 years of age declined between 1968 and 1978, but cancer incidence and mortality of the types linked to occupational exposure to chemicals and cigarette smoking rose among men over 45 and increased sharply among men over 65, according to an analysis published June 11.

Although the authors of the study acknowledged the difficulty of drawing direct causative links between chemical exposures and cancer, in their conclusion they urged "caution and vigilance." They pointed to a doubling in production of synthetic organic carcinogens during the decade studied and warned that the health effects of this growth "are not likely to be fully expressed before the end of this century."

The role of toxic chemicals in cancer causation "remains a matter of speculation that may never be simply resolved," the authors stated. They backed the maintenance of general controls, however, saying they may improve public health in unforeseen ways by countering other adverse health effects not now associated definitively with chemicals.

"The safer use of toxic chemicals in industrial societies may improve public health in the same way that better water supplies, sanitation, working and housing conditions, and nutrition did in the latter half of the nineteenth century," they argued.

The article, "Cancer Prevention: Assessing Causes, Exposures, and Recent Trends in Mortality for U.S. Males, 1968-1978" appeared in the journal *Teratogenesis, Carcinogenesis, and Mutagenesis*. It was written by Devra Lee Davis of Johns Hopkins University and the Environmental Law Institute; Kenneth Bridbord of the National Institute for Occupational Safety and Health, and Marvin Schneiderman of Clement Associates, Inc.

Doll-Peto Differences Cited

In presenting the findings at a June 10 Environmental Law Institute seminar, Davis pointed out that her group's conclusions differ as a result of methodology from those reported last year by Sir Richard Doll and Richard Peto

(Current Report, May 13, p. 1027). Doll and Peto's argument — that U.S. cancer mortality had not increased generally except for a rise attributed to cigarette smoking — was based on their decision to study only men under 65, a choice made in order to avoid diagnostic bias that can occur when studying older groups, Davis said.

"Given the marked reduction in cancer mortality for men from 35 to 44, analyses of men under 65 will tend to reflect this improvement in mortality and exclude effects in workers who have had longer industrial exposures to workplace hazards," the researchers stated in the article.

Along with the longer exposure period for the older men, Davis noted, poorer diets seen in past decades may have affected the results, since diet has been demonstrated to be a factor in resisting cancer. In addition, she pointed out that cigarette consumption was higher in the past, with cigarettes that were higher in tar and nicotine.

A decrease in infectious diseases also may have led to reduced cancer among younger men, according to the study, because there may have been less exposure to viruses that can both initiate and promote cancers by damaging the body's immune system. Per capita exposure to industrial chemicals also has decreased in recent years, it noted, due to automation of production processes and the growth of the white-collar workforce. Another factor cited was the lessening use of heavy metal carcinogens such as lead and arsenic.

Comments during the seminar centered on the study's use of synthetic organic chemical production as a measure of future cancer incidence and on the use of cancer as a measurement of the risk of chronic health effects from chemical exposure.

John Higginson, former director of the International Agency for Research on Cancer, recommended that workplace studies look beyond cancer for what may be worse exposure hazards, such as cardiovascular, neurotoxic, renal, psycho-physical, and premature aging ailments.

Sanford Gaines, assistant general counsel of the Chemical Manufacturers Association, questioned whether the study had actually linked a cancer increase to chemical production, citing the many data qualifications used by the researchers. Sheldon Samuels of the AFL-CIO Industrial Union Department pointed to lingering dangers of heavy metal carcinogens even after their production has declined, saying that they may affect cancer mortality for decades after their first use.

Noise

OSHA REVISES INTERPRETATIONS OF AMENDMENT IN FIELD MEMORANDUM

The Occupational Safety and Health Administration May 19 issued a memorandum to all regional administrators rescinding and revising some interpretations of the agency's hearing conservation rules that were detailed in an earlier memorandum issued in March.

These revisions concern follow-up procedures for audiometric testing programs, requirements to report hearing losses on the OSHA Form 200, the acceptance of old audiometric baseline data, monitoring requirements, the determination of the "action level" for employees working longer or less than eight hours, the definition of significant threshold shift, and the use of hearing protectors prior to baseline testing.

The updated memorandum is necessary because the March interpretations "were not properly coordinated," John Miles, OSHA field coordinator and author of the new

memorandum, told the regional administrators in a cover letter. He said that "as a result instructions were included which were either incorrect or are premature on the basis of the current rulemaking proceedings on the hearing conservation amendment."

Referral and Testing

In the March memorandum (Current Report, March 18, p. 828), the agency clarified 1910.95(j)(8)(iv)(a) to specify that the time period by which employers must inform employees in writing of the existence of a significant threshold shift is 21 calendar days.

As in the earlier memorandum, the agency still says that for companies with in-house testing capabilities, the determination of the STS can occur at the time of testing or at the time the annual audiogram is compared to the baseline. In cases where companies send their test results to a professional reviewer, the determination occurs when the employer receives the results of the review.

However, the new memorandum includes an additional statement that there may be a few circumstances where there may be justification for not meeting the 21 calendar day limit. The new memorandum instructs compliance officers not to cite "where the employer is taking reasonable steps to ensure notification and has kept the employee and/or employee representative informed of the situation."

OSHA Form 200

As in the earlier memorandum, the agency still maintains that under its recordkeeping regulations at 29 CFR 1904.2, work-related noise-induced hearing loss must be recorded on the OSHA 200 form.

The new memorandum tells enforcement personnel generally to consider a citation when an employer fails to report on the OSHA 200 form a hearing loss equal to or greater than 20 dB at any test frequency, and where that employee's time-weighted average noise exposure is 85 dB or greater. The agency stated further that if the employee was referred to a physician and it was determined that the loss was not work-related, then the loss does not have to be reported.

The memorandum noted that the provision for recording a significant threshold shift on the OSHA form 200 is currently stayed and is being reconsidered.

'Grandfathered' Audiograms

In the new memorandum, the agency has deleted the requirement in its March interpretation that in order for old baseline audiograms to be acceptable they must have been administered by a trained technician, taken at the test frequencies of 500, 1000, 2000, 3000, 4000, and 6000 Hertz, in a reasonably quiet room and with calibrated equipment, and that the old audiogram showing the lowest thresholds should be selected as the baseline.

Miles told the regional administrators that this interpretation provided "too much detail," which he said is inappropriate in light of on-going rulemaking proceedings.

The new memorandum does not detail requirements for showing that the old "grandfathered" audiograms reflect reasonable compliance with the audiometric test requirements of the amendment. It also states that if the employer wishes, new baselines can be established.

Monitoring Requirements

Miles said the old enforcement instructions regarding monitoring requirements in cases where employers decide to include all employees, regardless of their exposure, in the

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The same problems exist with respect to the PCB-specific provisions of the Connecticut statute, according to EPA.

The state also failed to submit any documentation concerning interstate burdens that might result if Connecticut law was substituted for TSCA, the agency said. If storage or disposal requirements by the state were significantly different from federal regulations or the regulations of nearby states, "serious obstacles to interstate commerce could result from companies having to transport wastes across state lines," EPA said.

Connecticut's interest in exemption from TSCA stemmed from an attempt by a company to warehouse waste PCBs in a Connecticut town. The move was opposed by the local community on up to the state level, but the warehouse complied with federal rules and won a permit. The state then applied for an exemption from the PCB provisions of the federal regulations so it could impose its own controls.

Reporting

PRODUCTION CONFIDENTIALITY TO BE PROTECTED AS VOLUME TOTALS ARE COMPILED, AGENCY SAYS

Total production statistics for chemicals on the Toxic Substances Control Act Chemical Inventory may be released under a scheme which would place in broad production categories those chemicals for which such data have been claimed confidential, according to the Environmental Protection Agency.

The plan, termed the "roll up" method by the agency, was developed to provide the public with general aggregated data on the chemicals while still protecting company claims of confidentiality.

About 40 percent of the 54,369 chemicals reported to the inventory had one or more submitters who made claims of confidentiality for production ranges, according to the June 23 agency notice (47 FR 27075). Of those, 15,422 substances had only one claim of confidentiality, 3,000 had two claims, and 3,010 had three or more claims.

Under the roll up method, chemicals on which manufacturers claimed confidentiality would be placed in one of the following broad categories:

- Range 1 — 0 to 1 million pounds;
- Range 2 — 1 million to 100 million lbs.;
- Range 3 — 100 million to 1 billion lbs.; and
- Range 4 — 1 billion lbs. and above.

In a limited number of situations where a chemical's production range overlaps the upper or lower bounds of the broad range, the inventory chemical will be placed in an expanded range based on the calculated total production, EPA explained.

Non-Confidential Production

The agency said that when originally reporting the chemicals for the inventory, firms which did not claim production data confidential placed the substances within one of the following 11 categories:

- N — none;
- 0 — 0 to 1,000 lbs.;
- 1 — 1,000 to 10,000 lbs.;
- 2 — 10,000 to 100,000 lbs.;
- 3 — 100,000 to 1 million lbs.;
- 4 — 1 million to 10 million lbs.;
- 5 — 10 million to 50 million lbs.;
- 6 — 50 million to 100 million lbs.;
- 7 — 100 million to 500 million lbs.;
- 8 — 500 million to 1 billion lbs.; and
- 9 — over 1 billion lbs.

Public comments on the roll up method of reporting confidential production totals will be accepted until Aug. 23 and should bear the identification number OPTS-80012. The comments should be sent to Document Control Officer (TS-793), Office of Pesticides and Toxic Substances, EPA, Room E-409, 401 M St. S.W., Washington, D.C. 20460.

For more information, contact the Industry Assistance Office at the above address or call (800) 424-9065 toll free, or 544-1404 in the Washington, D.C. area.

Reporting

STANDARD OIL REPORTS KIDNEY DAMAGE IN INHALATION STUDIES ON NAPHTHA STREAMS

Inhalation of selected naphtha streams resulted in degenerative kidney effects in male test animals, according to preliminary data submitted by Standard Oil Company of Indiana to the Environmental Protection Agency.

The firm submitted the data under Section 8(e) of the Toxic Substances Control Act, which requires firms to notify the agency when learning of data that shows a chemical to cause a health hazard. The studies were performed by the Illinois Institute of Technology Research Institute for the oil firm.

According to the notice, all male rats exposed to full-range alkylate naphtha in concentrations of 1.5 milligrams per liter to 15 mg/l suffered from degeneration or necrosis of the kidneys, while female test animals suffered no health effects.

Inhalation studies on a hydrocarbon blend containing approximately 22 percent full-range alkylate naphtha resulted in kidney tubular degeneration or necrosis for five of the 10 male test animals exposed to 15 mg/l, seven of the 10 exposed to 1.5 mg/l and one of 10 exposed to 0.5 mg/l. After a one month recovery period, degeneration was still noted in most of the subjects experiencing the health effects. Female rats experienced no kidney damage.

A similar inhalation study conducted on light catalytic cracked naphtha showed "no evidence of any treatment-related lesions," the company's report said. Another study on light straight run naphtha will be repeated due to respiratory problems experienced by all animals, including controls, it added.

Based on the preliminary data, the firm noted "there is reason to believe that certain naphtha streams may be responsible for the degenerative kidney effects seen in male rats." The American Petroleum Institute has been asked to study the substance.

Standard Oil noted that the test findings are similar to those reported by Exxon Corp. and Atlantic Richfield Co. in earlier Section 8(e) submissions which noted kidney effects resulting from exposure to a light alkylate naphtha and to unleaded gasoline.

Labeling

UNIONS PLEDGE MORE ACTIVITY IN STATES; TRADE SECRETS, HAZARD EVALUATION DEBATED

The AFL-CIO and member unions will continue to seek state and local chemical labeling laws "as long as we can and until such time as we see a strong federal standard," the labor federation's safety and health director, George H.R. Taylor, stated during Occupational Safety and Health Administration rulemaking hearings June 16.

Asked by Bill Leathers, a representative of Dow Chemical Co., what the AFL-CIO's position on state laws would be

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whenever ready, the water was dispensed into gallon jugs and consumed freely. It was also used to prepare milk from the dried powder. No incidence of gastrointestinal upset was experienced by any member of the family consisting of four males ages nine, 14, 15, 43 and two females ages 12 and 43 (none of whom had been to Mexico before).

It is not recommended that ozone be used in murky water or in suspect soft drinks. We used only clear water and used the ozone as a final treatment.

It is felt that neither the output of ozone nor the flow rate is critical because so much is lost to the atmosphere. As long as the bubbling action was lively and an excess of ozone was very evident by smell, 10 minutes contact was adequate.

Robert T. Anselmi

Denver

Chemically induced cancers

SIR: Under the News of the Week (C&EN, June 21, 1981, page 4) you published an article "Diet, workplace called cancer factors," which publicized the National Research Council committee's newly recommended "dietary guidelines" devised to help reduce cancer risks.

The article goes on to report that the guidelines had been criticized instantly by such epidemiologists as Devra Lee Davis, who calls for

continued vigilance in the workplace and environment and draws attention to increases during the past several decades of the bulk manufacture of chemicals that are known to cause cancer in humans, including a doubling of synthetic carcinogen production in the past decade. Davis is also reported to take issue with the study "The Causes of Cancer" by the British epidemiologists Richard Doll and Richard Peto, who concluded that cigarette smoking could account for the only discernible general increase in cancer mortality.

The divergent views of such reputable epidemiologists cast a shadow on the tenets of their science. In their above-mentioned study, Doll and Peto comment on this situation. They observe that "epidemiology has at present an undeservedly low reputation among people who have first artificially limited themselves to wondering which environmental pollutants to restrict and who then find that almost none of the few thousand chemicals they are worried about have been adequately studied by epidemiologists."

This is, however, to condemn epidemiology for failing to achieve ends that it does not have. Epidemiology starts not with the 10,000 chemicals polluting a particular city, but with the 10,000 annual cancer deaths in that city, and it tries to determine the major causes of these actual deaths."

There are several recent studies that proceed from mortality or morbidity statistics. Significant

for an appraisal of the threat of chemicals are:

1. "Epidemiologic Study of Refinery and Chemical Plant Workers," *Journal of Occupational Medicine*, Vol. 24, No. 3, March 1982. In this survey, the mortality experience of 8666 regular workers at Exxon's Baton Rouge refinery and chemical plant was determined. Mortality from all causes of death was lower than expected when compared with that of the U.S. population of similar sex, age, and race.

2. "A Retrospective Cohort Study of Mortality and Cancer Incidence Among Chemists," *Journal of Occupational Medicine*, Vol. 23, No. 7, July, 1981. The study examines mortality and cancer incidence among 3686 men and 75 women who were employed as chemists in 1959. During the period 1964 to 1977, they experienced lower overall mortality than other salaried employees of the chemical company.

3. "Cancer Incidence in the Love Canal Area," *Science*, 212, page 404, June 19, 1981: Data from the New York Cancer Registry show no evidence for higher cancer rates associated with residence near the Love Canal toxic waste burial site in comparison with the entire state outside New York City.

These findings weaken the thesis of the rise of chemically induced cancers so that its threat should not detract from the NRC committee's recent report.

Ernest W. Volkmann

Lafayette, Pa.

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