

Rachel's Environment & Health News

#531 - How They Lie -- Part 4: The True Story of Alar -- Part 2

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Continuing our history of Alar from last week (and filling in a few more details prior to 1986):

Alar is a growth-regulating hormone sprayed on apples to hold them on the tree longer and reduce bruising. Keeping apples on the tree longer darkens their red color, making consumers happy. Alar therefore provides economic benefits to apple growers, who can harvest their crop during a 5-week period instead of a 3-week period (which reduces their labor troubles, among other benefits).[1] The benefit to consumers is a cosmetically-enhanced apple that stays a bit crunchier a bit longer. Alar was voluntarily withdrawn from the U.S. market by its manufacturer, Uniroyal Chemical corporation, in 1989 after 10 years of controversy.

Despite the benefits of Alar, studies in 1967, 1973, 1977, 1978, and 1979 indicated that Alar (and its contaminant and breakdown byproduct, UDMH) causes several kinds of cancer in both sexes of two species of animals, mice and hamsters. There is also evidence of cancer in a third species, rats, exposed to Alar in a study conducted by the National Cancer Institute in 1978.[2]

By the early 1980s, the public health community had reached agreement that Alar/UDMH causes cancer in laboratory animals and is a "probable human carcinogen:"

** The International Agency for Research on Cancer (IARC) in Lyon, France, listed UDMH as a probable human carcinogen in 1982.[3]

** The Carcinogen Assessment Group within U.S. Environmental Protection Agency (EPA) in January, 1984 reached this same conclusion, and calculated a cancer potency number for UDMH.[4]

** The U.S.'s National Toxicology Program (NTP) in its 1984 report to Congress listed UDMH in the category, "may reasonably be anticipated to be carcinogens." The NTP's 1984 statement on UDMH began, "There is sufficient evidence for the carcinogenicity of 1,1-dimethyl hydrazine (UDMH) in experimental animals." [5] At that time, the NTP report was a consensus statement by nine U.S. federal agencies: Centers for Disease Control; National Institute for Occupational Safety and Health; Consumer Product Safety Commission; EPA; Food and Drug Administration (FDA); National Cancer Institute; National Institute of Environmental Health Sciences; National Library of Medicine; Occupational Safety and Health Administration.

During 1985, EPA hired independent auditors to visit the laboratory of Bela Toth at University of Nebraska to check his work. It was Toth who had conducted the 3 screening studies that had first revealed carcinogenicity of Alar/UDMH in mice and hamsters. The auditors criticized some of Toth's laboratory practices but in each case they concluded that the basic finding of carcinogenicity was supportable.[6]

In late summer, 1985, EPA announced it was preparing to ban Alar from use on food crops (its use on flowers would continue). EPA submitted its proposed ban plan to the 8-member Science Advisory Panel (SAP) established by federal law. The SAP held a one-day meeting and concluded, "The Toth Alar studies do give rise to concern over the potential oncogenicity of daminozide [Alar]."[7] Oncogenicity is the ability to cause tumors. However, the SAP said, the available studies would not permit EPA to calculate the SIZE of the cancer hazard posed by Alar and UDMH in food. If this were true, the legal effort to ban Alar would be an uphill battle.

The judgment of the SAP itself may have had a political bias. A Senate oversight subcommittee revealed that 7 of the 8 members of the SAP had been "paid consultants to the chemical industry or to organizations supported by the chemical industry at the time they served on the [Alar-decision] panel." At least one member of the SAP developed a direct financial connection to Uniroyal, Alar's manufacturer, shortly after the SAP rendered judgment on the Alar

data. Uniroyal hired Chris Wilkinson a few months after he left the SAP, and sent him back to Washington to lobby EPA scientists on Uniroyal's behalf, trying (unsuccessfully) to alter the protocols that EPA had set for Uniroyal's mouse studies of Alar.[8] Neither Wilkinson nor Uniroyal saw anything wrong with such a revolving door arrangement.

EPA was not required by law to follow the recommendations of the SAP, and EPA staff scientists disagreed with the SAP conclusion, but this was a political matter, to be judged at the highest levels of EPA. In January, 1986, EPA announced it would not seek to ban Alar, but would require apple growers to reduce its use by 50%, and would require Uniroyal, for the first time, to conduct its own studies of the carcinogenicity of Alar. Alar had then been on the market for 18 years and Uniroyal had never studied its carcinogenicity. Uniroyal says it has studied the health of its manufacturing workers exposed to Alar and found no problems, but the company refuses to release the data from those studies.[1]

Entering 1986, Alar was still legal but had fallen under a pretty severe cloud. During 1986, the following events occurred:

** Gerber, the baby food manufacturer, announced finding Alar in its apple juice and apple sauce.

** The American Academy of Pediatrics urged EPA to ban Alar.[10]

** Gerber, Heinz, and Beech Nut stopped accepting Alar-treated apples for use in baby foods.[9]

** The makers of Mott's apple products, Veryfine apple juice, and Red Cheek apple juice, among others, announced they would not accept Alar-treated apples.[9]

** The Washington Apple Commission urged apple growers in the state of Washington to stop using Alar.[10] More than half the nation's apple crop is grown in Washington state.

** The State of Massachusetts passed legislation to phase out (by 1988) the use of Alar for apples that would later be processed and/or used for infant or baby foods.[1]

** The State of Maine followed the example of Massachusetts, but restricted the use of Alar even more rapidly, by October, 1986.[1]

** Despite its continuous claims of safety for Alar, Uniroyal voluntarily sent an advisory to apple processors recommending that Alar-treated apples not be used for apple sauce because its intensive processing might cause Alar to release UDMH.[9]

** At least four of the country's major grocery chains notified their apple suppliers that they would no longer accept apples treated with Alar. Safeway, the nation's largest chain; Kroger, the second-largest; Giant, the biggest chain in the Washington, D.C., area; and Grand Union, in the New York area pledged to stop stocking Alar-treated apples.[11]

Events of 1987

** In January, 1987, EPA's Carcinogen Assessment Group (CAG) did what the Science Advisory Panel (SAP) in 1985 had said couldn't be done (and which the CAG had previously done in 1984[4]): CAG developed a quantitative estimate of the cancer potency of Alar/UDMH.[12] This was the cancer potency estimate used in 1989 by Natural Resources Defense Council (NRDC) in its now-famous report, INTOLERABLE RISK: PESTICIDES IN OUR CHILDREN'S FOOD.

** In March, NRDC, Ralph Nader, the State of New York, the Maine Department of Human Services, several pediatricians, and several children, filed suit in the U.S. Court of Appeals in San

Francisco to try to force EPA to ban Alar. This same group had petitioned EPA in 1986 to ban Alar, but the agency had refused.

** By now, NRDC has initiated a study of the hazards of 23 pesticides in the diet of American children during the first 6 years of life, focusing on three things: (a) the cancer hazard; (b) toxicity to the central nervous system; (c) inadequate protection of public health provided by a pesticide regulatory system that seems incapable of responding in a timely way to widely-acknowledged chemical hazards. This is the study that will eventually be accused of creating the "Alar scare." The fuse is lit.

[To be continued]

--Peter Montague (National Writers Union, UAW Local 1981/AFL-CIO)

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[1] Additional apple growers' benefits from Alar are described in Beth Rosenberg, "The Story of the Alar Ban: Politics and Unforeseen Consequences," *NEW SOLUTIONS* (Winter 1996), pgs. 34-50.

[2] Alar is the trade name of daminozide, also known as succinic acid-2,2-dimethylhydrazide, which is CAS #1596-84-5. UDMH is unsymmetrical 1,1-dimethylhydrazine, which is CAS #57-14-7. Alar is manufactured by reacting succinic anhydride with UDMH, a toxic component of rocket fuel. Therefore UDMH has always been a contaminant present in Alar. Furthermore, Alar de-grades into UDMH when it is heated --as in cooking apple sauce, or sterilizing apple juice for bottling --or when Alar is digested in the human stomach. So when we discuss the dangers of Alar, we are always necessarily discussing the dangers of Alar and UDMH combined. For citations to sources for this information, see REHW #530.

One 1973 cancer study and two 1977 cancer studies were described and cited in REHW #530; other studies indicating carcinogenicity of Alar or UDMH are: F.J.C. Roe and others, "Carcinogenicity of hydrazine and 1,1-dimethylhydrazine for mouse lung," *NATURE* Vol. 216 (1967) pgs. 375-376. And: National Cancer Institute [NCI], *BIOASSAY OF DAMINOZIDE FOR POSSIBLE CARCINOGENICITY* [DHEW Publication No. (NIH) 78-1333; NTIS document No. PB-285 073] (Port Royal, Virginia: National Technical Information Service [NTIS], March, 1978); this NCI study showed carcinogenicity among male rats. And: C.C. Haun and others, "A six month chronic inhalation exposure of animals to UDMH to determine its oncogenic potential," *PROCEEDINGS OF THE NINTH CONFERENCE ON ENVIRONMENTAL TOXICOLOGY* (Dayton, Ohio: Wright-Patterson Air Force Base, Aerospace Medical Research Laboratory, March, 1979).

[3] International Agency for Research on Cancer [IARC], *IARC MONOGRAPHS ON THE EVALUATION OF THE CARCINOGENIC RISK OF CHEMICALS TO HUMANS*, SUPPLEMENT 4 (Lyon, France: IARC, 1982). See Appendix 2. The IARC can be contacted at: IARC, 150 Cours Albert Thomas, 69372 Lyon, France.

[4] U.S. Environmental Protection Agency, *HEALTH AND ENVIRONMENTAL EFFECTS PROFILE FOR 1,1-DIMETHYLHYDRAZINE* [EPA/600/X-84-134] (Port Royal, Va.: National Technical Information Service [NTIS], January, 1984). The NTIS document number is PB88-130083.

[5] United States Public Health Service, National Toxicology Program, *FOURTH ANNUAL REPORT ON CARCINOGENS --SUMMARY 1985* (Washington, D.C.: U.S. Government Printing Office, 1986), pgs. 92-93.

[6] U.S. Environmental Protection Agency, Office of Pesticides and Toxic Substances, *REPORT OF THE AUDITS OF THE STUDIES ON THE CARCINOGENIC POTENTIAL OF SUCCINIC ACID 2,2-DIMETHYLHYDRAZIDE (DAMINOZIDE) AND 1,1-DIMETHYLHYDRAZINE IN SWISS MICE, STUDIES CONDUCTED AT THE EPPLBY INSTITUTE, THE UNIVERSITY OF NEBRASKA MEDICAL CENTER, OMAHA, NEBRASKA, AUDITS CONDUCTED JANUARY 21-24, 1985* (Washington, D.C.: U.S. Environmental Protection Agency, 1985). And: D.G. Goodman, *REVIEW OF THE BLOOD VESSEL NEOPLASMS OF LUNG, KIDNEY, AND LIVER IN SWISS MICE ADMINISTERED 1,1-DIMETHYLHYDRAZINE IN DRINKING WATER, PREPARED FOR DYMARC CORPORATION, 1140 ROCKVILLE PIKE, ROCKVILLE, MARYLAND, AUGUST 19, 1985* (Washington, D.C.: U.S. Environmental Protection Agency, 1985).

[7] Philip H. Gray, Jr., "Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Scientific Advisory Panel: Review of a Set of Scientific Issues being Considered by EPA in Connection with the Special Review of Daminozide [Alar]," (Washington, D.C.: U.S. Environmental Protection Agency, October 4, 1985).

[8] Eliot Marshall, "Science advisers need advice," *SCIENCE* Vol. 245, No. 4913 (July 7, 1989), pgs. 20-22; and see Beth Rosenberg, "The Story of the Alar Ban: Politics and Unforeseen Consequences," *NEW SOLUTIONS* (Winter 1996), pg. 37.

[9] Winston Williams, "Polishing the Apple's Image," *NEW YORK TIMES* May 25, 1986, pg. C4.

[10] Paul Roberts, "The Big Red Machine; Washington's battle-scarred billion-dollar apple industry has proved there is life after Alar," *SEATTLE [Washington] WEEKLY* February 23, 1994, pgs. 16-23.

[11] Irvin Molotsky, "Consumer Saturday; A Ban on Treated Apples," *NEW YORK TIMES* July 26, 1986, pg. A10.

[12] W. Pepelko, "Memorandum --Evidence for Carcinogenicity of 1,1 Dimethylhydrazine (DMZ)," (Washington, D.C.: U.S. Environmental Protection Agency, Carcinogen Assessment Group, January, 1987). See also: Eliot Marshall, "A is for apple, Alar, and... alarmist?" *SCIENCE* Vol. 254, No. 5028 (October 4, 1991), pgs. 20-22.

Descriptor terms: alar; pesticides; apples; nrdc; natural resources defense council; epa; bans; regulation; alar; daminozide; udmh; carcinogens; cancer; uniroyal; nci; ntp; iarc; carcinogen assessment group; cag; intolerable risk: pesticides in our children's food; ralph nader;