PESTICIDE RESIDUES IN MILK

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The Federal Food, Drug, and Cosmetic Act enforced by the Food and Drug Administration is the legal instrument which guards and protects the safety of all our foods, drugs, and cosmetics. Under this law a food may not contain any amount of added poisonous substance unless a safety level called a "tolerance" has been established for that substance. A recent amendment to the law, called the Miller Amendment, provides specifically for tolerances for pesticide chemicals added to raw agricultural products. If a tolerance has been established, the amount of the substance present must not exceed the tolerance. Such tolerances have been established for many pesticide chemicals on a large variety of raw agricultural commodities. You may ask if tolerances have been established or considered for milk. They have been considered but no tolerance yet has been established for any such substance in milk. The Food and Drug Administration takes a serious view of any proposal to add foreign substances to milk and milk products. Let us examine the problem in its several ramifications.

Soon after the Food and Drug Act of 1906 became law, the Bureau of Chemistry of the Department of Agriculture, which then enforced the law, adopted the policy that milk should not contain added poisonous chemicals such as formaldehyde. This policy was reaffirmed shortly after World War II, when DDT became available for civilian use. It was discovered that use of DDT for fly control in dairy barns results in DDT in the milk as it comes from the cow. With this discovery the Food and Drug Administration restated the policy that milk should not bear added poisonous substances. The Department of Agriculture, in registering labels for DDT, required warnings against use of the chemicals around dairy animals and against treated forage of dairy animals. These warnings, if followed, should keep the pesticide out of milk.

Today, the policy of the Food and Drug Administration that there shall be no residues in milk is being subjected to searching scrutiny. Agricultural authorities, pesticide manufacturers, and others are asking whether it is necessary. We in the Food and Drug Administration are quite willing to examine and reconsider the traditional policies in the light of current facts and future discoveries.

First, let us consider the basic reason for keeping poisons out of milk. Milk is a unique food. It is the principal article of diet for infants and many invalids, groups of people unable to resist physical stresses with which normal children or adults can cope.

Most of the pharmacological studies on pesticide chemicals are made on weanling animals. These studies show what level of poisonous residues in the diet of such animals causes no detectable harm, but do they show what level of poisonous residue in the diet of a suckling animal or a sick one is safe? We do not know the answer. However, there are scientists inside the government and outside it who have grave reservations about the advisability of tolerating any added poisons in milk on the basis of currently available pharmacological data. Certainly, if the Food and Drug Administration's traditional policy—"There shall be no added poisons in milk"—were to be changed, the change should come only after the most careful consideration of all available facts by scientists in the fields of pharmacology, medicine, and public health.

As mentioned above, we establish tolerance today under the Miller Amendment to the Food, Drug, and Cosmetic Act. The amendment provides that a petitioner may request a tolerance for a pesticide chemical in a raw agricultural commodity. If the petition shows that the requested tolerance level is safe and can be met and if the Department of Agriculture certifies that the pesticide chemical is useful, then the Food and Drug Administration establishes a permitted tolerance level for residues of the chemical. In harmony with the requirements of the Miller Amendment we will accept and file petitions requesting tolerances in milk, provided, however, that the basic evidence specified in the law is included in the petition. We will consider each application on its own merits and if a petition demonstrates the safety of the requested tolerance in milk we will establish a tolerance.

Prominent scientists, responsible industry members, and law enforcement officials agree that the Food and Drug Administration must require greater evidence of safety in setting a tolerance in milk than would be required to justify a tolerance on other foods. It is not known whether FDA will ever set a tolerance greater than zero for any pesticide in milk.

1Presented at the Northwest Regional Milk Sanitation Seminar, Portland, Oregon, September 12, 1957.
That is where we stand today. Our fundamental philosophy is being scrutinized and re-evaluated but it is not changed now. Milk containing residues still is illegal in interstate commerce.

Returning now to the specific problem of DDT in milk, the Food and Drug Administration has been concerned for several years that food bearing residues of this substance and other chlorinated hydrocarbon pesticides may have public health significance. It is now well established that DDT concentrates in the fat when taken into the body of an animal. In the case of dairy animals, the DDT is excreted in the milk and because of its fat solubility it will be concentrated in the fatty dairy products such as cream, butter, and cheese.

Let us make no mistake, DDT is a "poison" as the term is commonly understood—otherwise it would not be effective as an insecticide. Injury to man from consumption of foods contaminated with small amounts of DDT has not been demonstrated. However, changes in the liver have been noted in rats fed a diet containing only 5 parts per million of DDT. It is known that DDT accumulates in the fat of human beings exposed to the insecticide.

The position of milk in the American diet is supreme. Dairy products make up a little more than 20% of the average civilian diet in the United States. Fluid milk itself constitutes at least 25%. Compare this with other foods in our diet: wheat products make up 9%; potatoes, less than 8%, and no single class of fruit more than 3%. The integrity and wholesomeness of milk and milk products as the principal diet of infants and an important element of diet throughout the human life must not be brought into question.

With the development of scores of new insecticides during the last decade it has become increasingly apparent that some of these do constitute a threat to the safety of our milk supply. A number of these new insecticides have been found similar to DDT in that they are accumulated in the fat of dairy and meat animals and excreted in the milk. Let me re-emphasize, since no tolerance has been established for any pesticide in milk, milk containing DDT and these other insecticide residues is illegal under the Federal law. Most states and many cities have similar laws.

This means that insecticides used on cows, in dairy barns, cream stations, and processing plants must be selected and used with great caution in order to avoid contamination of milk or other dairy products at all points from farm to consumer. To the farm producer it also means that crops grown either for use or sale for feeding dairy and meat animals must likewise be free from poisonous residues which may be transferred to the milk or meat or within any tolerance which may be set for the feed forage crops.

During the fall of 1955 and early 1956, about 1600 samples of milk from all sections of the United States were collected by our inspectors. The samples were frozen, packed in dry ice, and shipped by air to our Washington laboratories, where they were examined for antibiotics. Half the samples also were examined for pesticide residues. Sixty-two per cent of the 800 samples tested contained pesticide residues. Pesticides were encountered in the following order of incidence: BHC 60%; DDT 54%; Lindane 26%; Rhothan 24%, and Methoxychlor 3%. There seems to be two main sources of milk contamination: residues on forage crops, and contamination as a result of insecticide sprays either on cows themselves or in the barns and surroundings.

The presence of these residues in the nation's milk supply is a serious problem to the dairy industry and to enforcement officials alike. The Food and Drug Administration is convinced that an educational program in depth is the best solution. Acting on this belief, our first step was to transmit to the U.S. Department of Agriculture and Public Health Service the results of our 1955-56 survey, both as to pesticides and antibiotics.

The Department of Agriculture immediately initiated an extensive educational program designed to eliminate antibiotics and pesticide residues from the milk supply. During the period from February to April of this year four regional committees of State Extension dairymen met to consider the problem with State Extension directors and members of the Department of Agriculture. The recommendations of these committees for eliminating antibiotics and pesticide residues from the milk supply have been sent by the Department of Agriculture to all states for their use. The recommendations are being distributed widely through farm and trade meetings, schools, county agents, radio, TV, the press and other media.

Last month the Food and Drug Administration issued guide lines for the responsible use of pesticides to assist producers and manufacturers of dairy products in assuring the legality, safety, and wholesomeness of their products with respect to the possibility of contamination with pesticides. These guide lines are based on the best information now available, which admittedly is incompletely and subject to change in certain instances. Much of our knowledge
in this field has resulted from very recent investigation. Where the available information is not adequate to show that no contamination of milk will result from the recommended use, we can only advise against such use until the evidence is developed. The law places responsibility for developing this evidence on the manufacturer of the pesticide or the proponent of its use for the purpose. However, it is the responsibility of the Food and Drug Administration to take whatever action is necessary for the protection of the public health and the integrity of the nation's food supply.

The following guidelines which were correct as of July 16, 1957 are quoted. We should recognize that it may become incomplete or inaccurate as more knowledge is available as new products are registered for these uses and new tolerances are established. We plan frequent revision of the statement as it may be necessary.

"1. Insecticides which are safe for spraying cows and for other uses in and around the dairy barn, provided that utensils and the drawn milk are adequately protected:

Pyrethrin MGK 264
Piperonyl Butoxide MGK R-11 (repellant)
Allethrin Tabutrex (repellant)

"2. Insecticides which may be used for fly control around dairy barns, provided the insecticides are not sprayed directly onto the cow or on the feed trough, and provided utensils and the drawn milk are adequately protected:

Diathion—spray, bait, cords Dipterex—bait only
Parathion—cords only Lindane—spray, bait
Malathion—spray, bait Methoxychlor—spray only
Chlorthion—spray, bait TEPP—bait or floor spray only

"3. Certain pesticides may be used on growing crops intended for dairy cattle feed provided the amounts remaining on the feed do not exceed approved tolerance levels. When the pesticides are used according to label directions, crops sprayed with the following pesticides are within legal tolerance levels and are considered safe:

Methoxychlor Sabadilla
Heptachlor Ryania
TEPP Malathion
Rotenone Parathion
Pyrethrin (Pyrethrin-piperonyl butoxide)

"Although a number of other insecticides have been used for these purposes in years past, the recent discoveries regarding appearance of insecticides in milk from spraying of the cow or other uses around the dairy barn, have made it necessary to re-examine the propriety of use of insecticides other than those listed above. The public should not be used as 'guinea pigs' for the testing of products which may be injurious."

TEPP when used according to directions on growing crops will not leave a residue. Rotenone, Pyrethrum, Sabadilla, and Ryania are exempt from requirement for tolerances when used according to directions on growing crops.

If you have an insect problem which cannot be controlled by one of the insecticides listed as safe, consult an expert for advice as to what may be used and what special precaution may be necessary to ensure protection of dairy products.

With the combined efforts of industry and government we are convinced substantial progress is being made. The market for dairy products depends upon continuing public confidence in their safety, integrity, and wholesomeness. Let us ensure this continued confidence. Thank you for this opportunity to discuss a most vital subject at your Milk Sanitation Seminar.