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Prevention of Pesticide Residues in Milk

Prepared by—

Staff members of the University of Idaho Agricultural Experiment Station and Agricultural Extension Service.

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Pesticide residues in milk and milk products can be prevented by closely following the instructions found in this publication or on the pesticide container label.

Prevention of Pesticide Residues in Milk

Pesticides are important in dairy farming. They are used to control weeds, plant diseases and insect pests. They must be properly used to prevent residues from occurring in milk and milk products. The Food and Drug Administration, U.S. Department of Health, Education and Welfare, has emphasized that no pesticide residue will be allowed to occur in milk. The use of all pesticides that will result in residues in milk must be avoided.

Infestations of blow flies, horn flies, house flies and stable flies are often found on dairy farms. They breed in manure and other moist organic matter, therefore, the first and most important step in fly control is sanitation. Systematic removal of fly-breeding materials must be an integral part of any dairy management program.

Follow these suggestions when using fly sprays:

- Do not apply any insecticide recommended for house fly control except pyrethrum in the milking parlor, barn, or loafing shed while animals are present.
- Use only pyrethrum sprays in the milk room.
- Do not apply fly sprays in such a way that they will contaminate feed mangers, feed, or water.
- Use fly control materials only in the amount and manner recommended. They are most effective when applied with a good sprayer.
- Treat before fly populations build up and repeat applications before a fly problem develops.

Insect Pest Control on Dairy Animals

Important: In order to comply with Food and Drug Administration regulations concerning insecticide residues in milk, only the materials appearing below should be used on dairy animals.

Insect	Insecticide	Dosage Amount of Insecticide Per 100 Gallons of Spray or Other Treatment as Indicated	Restrictions – Remarks
Lice and Ticks	Rotenone	2 lbs. 5% wettable powder, or 1% dust	Two applications about 2 to 3 weeks apart necessary for best results.
	Pyrethrins plus synergist	Follow manufacturer's directions. Finish spray usually contains 0.025 pyrethrin plus 0.25 synergist.	
Grubs	Ronnel (Trolene)	One 37.5 gram pill per 300 lb. body weight.	Do not treat within 60 days of lactation.
	Rotenone treatments are of limited value. They kill only about 80% of the grubs in the back and usually have no appreciable effect on subsequent infestations when control work is on an individual basis.	7½ lbs. 5% wettable powder as a spray, or prepare a wash with 12 ozs. 5% rotenone wettable powder plus 4 ozs. laundry soap per gal of water or rub dust containing 1⅔% rotenone into back.	For spraying use high pressure, at least 250 pounds. When using wash, rub solution into back with stiff brush. Use brush or hand to rub dust into back thoroughly. First application just before grubs drop and repeat at 30-day intervals until grubs no longer appear.

Insect Pest Control on Dairy Animals (Continued)

Insect	Insecticide	Dosage Amount of Insecticide per 100 Gallons of Spray or other Treatment as Indicated	Restrictions—Remarks
Horn Flies	Methoxychlor*	Use 1 heaping tablespoon 50% wettable powder per animal. Rub lightly into hair on back and neck.	Apply methoxychlor no oftener than once every 3 weeks.
	Malathion*	Use 1.5 ozs. (3 tablespoons) of 5% dust per animal. Do not contaminate feed, water, or milking equipment.	Do not apply to lactating dairy cattle later than 5 hours before milking or during milking. Application may be repeated at 10-14 day intervals.
	Pyrethrins plus synergist	Follow manufacturer's directions for preparing finished spray. Directions usually call for applying wet or mist sprays every 3-7 days.	These materials do not have long residual effect. Frequent treatments will be necessary. Automatic sprayers that treat dairy cattle are available. When their use is practical a pyrethrin oil spray is generally recommended.
	Lethane or thanite	Follow manufacturer's directions. These usually call for use as a mist spray applied daily with hand sprayer.	
	Allethrin or MGK 264 or MGK R-11 (repellent) or Tabutrex (repellent)	Follow manufacturer's directions.	

*Do not apply methoxychlor or malathion to cows in milking parlors or in barns until cows are milked and ready to be turned out. These dust treatments are not adapted for use in milking parlors.

Fly Control in and on Dairy Barns

Important: In order to comply with Food and Drug Administration regulations concerning insecticide residues in milk, only the materials appearing below should be used in or on dairy barns.

Insecticide	Dosage Amount of Insecticide Per 100 Gallons of Spray or Other Treatment as Indicated	Restrictions—Remarks
Dry or wet baits containing Dibrom, Dipterex, Diazinon, or malathion.	Use as recomended by manufacturer.	
Dibrom 0.3% as a spray.	5 pints 41% (4 lbs. per gallon) emulsifiable concentrate.	Over but not on animals and in infested areas.
Diazinon 0.25% as a spray.	8 lbs. 25% wettable powder or 1 gal. 25% emulsifiable concentrate.	Do not use in milk rooms or contaminate feed and water. Apply all sprays at rate of 1 to 2 gallons per 1,000 square feet of surface. Exclude animals at time of application.
Malathion 1% as a spray.	32 lbs. 25% wettable powder, or 1½ gals. 57% emulsifiable concentrate.	
Korlan 1% as a spray.	32 lbs. 25% wettable powder, or 8 gals. of 12% emulsifiable concentrate, or 4 gals. 24% emulsifiable concentrate.	
Lindane 0.3-0.5% as a spray.	10-16 lbs. 25% wettable powder or 1½-2½ gals. 20% emulsifiable concentrate.	
Methoxychlor 2.5% as a spray.	4 lbs. 50% wettable powder.	
Pyrethrins plus synergist as a spray: 0.1-0.2% pyrethrins plus 1-2% synergist.	Use as space spray in accordance with manufacturer's directions.	May be used in milk rooms. Usually used at rate of 1 to 2 ozs. per 1,000 cubic feet.

Herbicides

Any herbicide that is specifically cleared for use on feed or forage crops is approved only if evidence shows there will be no residue in milk if used in the approved manner. It is important to read the label before applying any herbicide on feed or forage to be used by producing dairy cows.

Caution should be used when feeding cannery wastes or crop residues, such as alfalfa and clover chaff, to producing dairy animals. Herbicides and other pesticides used in the production of fruit, vegetables, and seed crops may not be approved for use on feed and forage crops.

The following herbicides have clearance for use on feed or forage crops.

1. 2,4-D on a no-residue basis for corn and small grains. It may also be used for spraying pastures with the following precautions:
   a. Remove producing dairy animals at time of application.
   b. Do not graze for a 2-week period. This is advisable, not only to prevent residue, odor or flavor from appearing in milk, but also from the management standpoint. Delayed grazing will assure a better weed kill and will allow the pasture grasses to grow more luxuriantly so that they offer more competition and produce more forage.
2. MCPA on a no-residue basis applied to small grains when underseeded with alfalfa or sweet clover.
3. Dinitro DNBP (dinitro alkanol amine salts) for pre-emergence annual weed control in alfalfa or in small grains. Do not pasture treated fields.
4. Amitrol (Aminotriazole, ATA Weedazol) on a no-residue basis in pastures or on other crop lands providing:
   a. The animals are removed before application.
   b. Pasture is not grazed or hay is not cut for 8 months following application.
   c. Amitrol can be used 2 weeks before plowing and planting corn.

d. No other crop should be planted before 8 months after application.

e. Application is made before October 1.

5. Soil sterilants, sodium chlorate and carbon bisulfide, may be used at approved rates and times, without causing a residue in the milk of animals grazed in the area.

Use of other herbicides, unless specifically cleared for use on feed or forage crops may result in residue problems in milk.

The practice of grazing producing dairy animals on roadsides, ditch banks and other waste areas may result in residue problems, where unapproved herbicides have been used to treat these areas.

Hay and Forage Crops

Insecticides

The Food and Drug Administration has established residue tolerances for a few insecticides on hay and forage crops. When such chemicals are used according to directions, no residues should occur in the milk. This must be assured before tolerances can be established on forage crops. The following insecticide residue tolerances have been established on hay and forage crops:

Malathion, 8 parts per million; parathion, 1 part per million; demeton, 5 parts per million on fresh alfalfa and clover, 12 parts per million on alfalfa hay and clover hay; Phosdrin, 1 part per million; methoxychlor, 100 parts per million; Sevin, 25 parts per million on cornfodder and forage.

Malathion, parathion, demeton, Dibrom, Phosdrin, methoxychlor and Sevin may be used to control some of the insect pests that attack Idaho hay and forage crops. If these are used in the amounts recommended and if the suggested interval between application and cutting is observed, the forage can be fed safely to dairy animals.

Aldrin, Aramite, dieldrin, heptachlor, DDT, toxaphene are recommended to protect legume and grass seed crops from destructive insect pests. All of these leave persistent residues that may appear in milk when forage treated with them is fed to dairy animals. Trithion is recom-

mended for limited use on legume seed crops. The persistence of Trithion residues on these crops has not been established. Dieldrin, or heptachlor used to control over-wintering adult alfalfa weevil, will not result in residues on hay crops if applied in early spring prior to new growth.

The FDA has established a tolerance of zero for aldrin, Aramite, TEPP, dieldrin, and heptachlor on hay and forage crops. No specific tolerance on hay or forage has been set for DDT and toxaphene, which means no residue is permitted. Crop residues or field refuse from forage legumes or grass seed fields treated with any of these chemicals should not be fed to dairy animals. Pelletized or wafered livestock feeds which incorporate crop residues from fields treated with any of these insecticides must not be used as dairy feed.

Cannery Wastes

Insecticides

Some dairymen use cannery wastes as feed or ensilage. It is necessary to protect practically all vegetable crops from insect attack. Information on the amount of insecticide residue which might appear on field refuse and cannery waste is extremely limited.

The FDA has established residue tolerances for most insecticides on raw agricultural crops. These tolerances are specific for insecticides and the crops to which they can be applied. Dosage rates are recommended by Federal and state workers. Intervals between application of insecticides and harvest date based on residue data are a part of pest control recommendations.

To avoid residues recommendations for use of pesticides, somtimes require that applications be made before the edible portion of the crop appears. Some insecticides are recommended only for pre-planting soil treatment. The fact that a residue tolerance has been set and control recommendations followed, is no assurance that the parts of the plant not used for human consumption would be free of objectionable residues. Often these are the parts used as livestock feed.

Because of their short life, certain chemicals may be registered on a "no residue" basis. This means that data have been submitted to

the U.S. Department of Agriculture showing that, when used as directed, no residue would be present on the portion of the plant used for human food. A few chemicals such as sabadilla, rotenone, sulfur, and pyrethrum, because of their inherent safety, are exempt from requirement of a tolerance. These are generally less effective in the control of insects and are not often used.

The degree to which pesticide residues may concentrate in cannery wastes or ensilage made from these wastes is known for only a few crops. For example, apple pomace which consists largely of the outside skin of the fruit may contain DDT residues much greater than the the 7 parts per million allowed on the whole fresh fruit.

It is extremely difficult to give definite instructions for safe feeding of cannery wastes to dairy animals. To guide County Extension agents, processors, poultrymen, dairymen, and those interested in livestock feeding, situations where they should be alert to possible residue problems appear in the **Insecticide Recommendations of the Entomology Research Division for the Control of Insects Attacking Crops and Livestock** 1961 Season. USDA Agriculture Handbook No. 120. (For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D. C. Price 65 cents). Attention to these suggestions will aid in preventing residue contamination of milk, poultry and poultry products, and other meat.

In general, it is unwise for dairymen, poultrymen, or those fattening animals for slaughter, to feed field wastes or cannery refuse from any crop treated with aldrin, Aramite, BHC, chlordane, DDT, dieldrin, endrin, heptachlor, Kelthane, lindane, Perthane, TDE, Thiodan, toxaphene, and Trithion. Additional feeding tests may alter these suggestions in the future.

On the other hand, it would appear that cannery waste from vegetable crops treated with the insecticides Diazinon, Dibrom, malathion, methoxychlor, nicotine sulfate, Sevin, parathion, Phosdrin, pyrethrum, sabadilla, rotenone, and TEPP could be fed provided the recommended dosages were not exceeded, and the proper interval between application and harvest were followed.

Fungicides

At present it is not known if fungicidal residues on crop waste or on crop refuse from processing industries will contaminate milk or meat when fed to dairy or meat animals. However, many fungicides utilized for seed treatment and for the control of foliage diseases are highly toxic to warm-blooded animals if taken internally. Therefore, it is suggested that precautions be taken regarding the utilization of crop waste or refuse from processing industries for feeding of dairy or meat animals.

Pesticide Drift

Pesticide drift may be a problem to dairymen in some localities. Growers whose crops are immediately adjacent to pasture being utilized by dairy animals should recognize the difficult problem that confronts the dairymen. They can help by applying only those insecticides which do not leave persistent residues. Efforts should be made to apply these materials under conditions that minimize the possibility of drift.

Orchardists whose plantings are immediately adjacent to hay crops or pastures being utilized by dairy cows can be of assistance by modifying their spray programs to minimize the possibility of drift from commonly used insecticides having persistent residues such as BHC, DDT, dieldrin, TDE, toxaphene, Kelthane and Tedion.

There is less risk of milk contamination from drift where methoxychlor, Sevin, Guthion, malathion, parathion, Phosdrin, and TEPP are used. In some cases orchardists could cooperate by using these materials on the several outside rows of their orchards adjacent to pastures or hay crops. Dairymen could also help by pasturing next to orchards prior to spraying and then fencing off a strip approximately 150 to 200 feet next to the orchard and leaving this area ungrazed for a period of about 10 days after each spraying.

Summary

There must be no residues of pesticides in milk or milk products. On the basis of present limited information, it appears that the greatest danger of pesticide residues appearing in milk results from:

- Direct application of nonrecommended insecticides or improper applications of recommended insecticides to dairy cows, or in dairy barns.
- Feeding forage which bears residues of pesticides in excess of established tolerances.
- Feeding crop residues, field, or cannery wastes from crops treated with pesticides which have long-lasting residues.
- Pesticide drift on pastures.

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