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PCB's pose potential problems

by Philip Harrison

A **NOTHER** hazard to the dairy farmer: Polychlorinated biphenyls. Amounts of this chemical are being detected in milk, usually there by way of feed stored in a concrete silage silo that has incorporated a particular type of sealant used on the inside walls. These silos have been found in Ohio, Kentucky, Indiana, and Tennessee.

What are PCB's? The term "polychlorinated biphenyl" refers to a family of organic chemicals which have been produced and marketed in this country for 40 years. The sole manufacturer is the U. S. Monsanto Industrial Chemical Company, currently producing approximately 40 million pounds of PCB's per year.

PCB's manufactured by Monsanto are marketed under the trade name "Aroclor," followed by a four digit number, with "500" typically represented by the first two digits, "15" and the approximate chlorine percentage represented by the second two numbers. Thus, Aroclor 1584 is a mixture containing approximately 84 percent chlorine. "Aroclor 1584" was included in the formula of a sealant (Cumar) that was used by some silo manufacturers... thus, feed and milk contamination.

Any produce with a 5.0 ppm or greater of PCB's in milk is listed as adulterated by federal and state agencies because of excessive PCB contamination.

PCB's have also been used as dielectric fluids in capacitors and transformers, hydraulic fluids and heat transfer fluids. Other uses have included plasticizers and solvents in adhesives, printing ink, sealants, moisture retardants, paints and pesticide carriers.

PCB's belong to the same chemical family as DDT, dieldrin, aldrin and heptachlor. They also share some of the same characteristics in that they are: (1) stored in body fat, (2) difficult to move out of the body once they are deposited in fat and (3) slowly excreted in milk.

If PCB's are found in milk...

The objective is to reduce the PCB level in milk as soon as possible so that it is again marketable. PCB's stored in external bodies must be depleted.

1. Identify the source. Feed is a likely source with silage being the most probable cause of contamination. It is almost certain to be if the silage was stored in a silo constructed with concrete staves between 1960 and 1975 and coated with an epoxy called Cumar, or any other epoxy coating which used Aroclor 1584 as the plasticizer. Analysis of the silage or scrapings of the silo wall need to be made.

2. Stop feeding the contaminated feed. This is essential. Do not try to salvage contaminated feed by feeding it to hogs, dry cows, or steers as the PCB's will accumulate in the body fat of these animals, also.

3. If no feed or water source can be found, PCB's in the milk are from body stores coming from feeds fed previously.

4. Decontaminate cows by "milking out" the PCB's. There is no other method of getting rid of the PCB's that are stored in the cow's fat.

Using suitable feedstuffs, formulate the best milk-producing ration possible without causing a reduction in the percent milk fat.

Upon withdrawal of the contaminated feed in controlled lactation studies, there was a rapid drop in residue concentration of about one-half in 14 to 16 days. This phase was followed by a much slower elimination rate which was described as 1 percent drop per day of what remained each day.

Decontamination time will vary according to the level of PCB's in milk and body fat and the amount of milk that is produced daily. A minimum of 30 to 60 days is likely to be needed. However, in some herds, decontamination may extend to nine months or a year.

5. Beware of fresh snow and first-calf heifers. Because of excessive body fat on these particular animals, they would be loaded with PCB's. Do not market the first milk if the herd level is near the tolerance level.

6. Repairs or do not use the contaminated silo until inner surface has been cleaned and recoated. The only certain method for eliminating PCB's in silage is to build a new silo or replace the staves in the contaminated silo. Barrier coating is another alternative but cannot be considered a permanent solution because the barrier coating may come loose with time.

If barrier coating is feasible, then extreme care is required. All dirt and loose particles of old coating

and/or deteriorating wall surfaces must be removed. The barrier coating will be no better than the surface to which it is applied.

Special problems with sealing...

A special problem is encountered when the previous coating is still intact or the silo is constructed of wax-treated blocks. For good bonding, the barrier coat requires a firm, rough surface. Sandblasting may be the best way to remove insect coating. Do not use organic solvents because they will spread PCB contamination and may leave the surface unfit for recoating.

The barrier coating must withstand the harsh environment inside the silo. In addition, the sealer should not contain chlorinated hydrocarbons or toxic chemicals which will contaminate the silage (FDA approval for the product is recommended).

Milk is under constant surveillance for chemical residues, including PCB's, which are only one of a number of chemicals screened for in milk supplies. This means that more care needs to be given to knowing the history of all feeds used by dairymen.

Any dairyman who is using a concrete silage silo which was coated with Cumar is in jeopardy. If the type of coating is unknown, silo wall scrapings should be analyzed for PCB's.

Be cautious about the use of sewage sludge for fertilizer as it may be contaminated with PCB's from industrial sources.

It would be good insurance to document all feed purchases and store samples of these feeds for at least one year.

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