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Sources Of Pollution By Polychlorinated Biphenyls

(The Cooperative Extension Service at the University of Maine has distributed to Hancock County Extension Agents the following article on poultry contamination by polychlorinated biphenyls written by Harry C. Welson, Jr. and Forest V. Muir, poultry specialists.)

In mid 1971, a poultryman called upon to identify PCB might have thought it was initials for another government agency — such as Production Control Bureau. Not too many today can give a precise definition of PCB (polychlorinated biphenyls) but most everyone in the poultry industry, and a number of those outside the industry, are aware that it is a chemical substance which can contaminate food. Too many outside the poultry industry either misunderstand the situation or are misled by newspaper releases, or both.

In an attempt to add some clarification, we have taken parts of articles which were prevalent several months ago when PCB's were found in poultry products in the Southeast.

"What are PCB's? PCB is the common name for polychlorinated biphenyls. It is not a pure substance, but a highly stable industrial compound with many valuable uses. This explains why it is showing up in our environment; it is widely used and it does not break down easily.

"It is a mixture of chlorinated components. You pump chlorine into a mixture of biphenyl material. When it reaches certain levels, sometimes over 60 percent chlorine, it takes on certain physical characteristics.

"While it was reported by one source that Monsanto was the only domestic manufacturer, this is unlikely since a number of concerns have licenses to manufacture PCB, including corporations like Westinghouse, General Electric, Allis-Chalmers, Federal Pacific Electric Co., Wagner Electric and others.

"Manufacturers are also located in Germany, Italy, France, Japan and Russia.

"PCB is a chlorinated hydrocarbon quite similar to DDT. It is a contaminant, not a carcinogen (cancer causing).

"Information indicates commercial manufacture began in 1929. The product varies from mobile, oily liquids to crystalline white solids and hard nonrystalline material. Because of its many forms and properties, PCB's have found an application in many diverse fields, such as electrical insulation, fire-resistant material, heat transfer, hydraulic fluids, lubricants for use at high temperatures and pressures, ceiling and expansion mediums, as contituents in paints, varnishes, lacquers, adhesives, inks and waxes.

"Though rumors abound about PCB's appearing in various products, Poultry and Egg Institute of America's scientific director, Margaret Huston, has found no evidence PCB's are used in plastics as such. It might be used in inks used on plastic or paper cartons, however.

"PCB's are used in business forms which make several copies without the use of carbon paper.

"PCB contamination has been discovered in varied places during the past year, but got little publicity until the Carolina fish meal episode. Contamination of a flock of chickens in New York last year was reportedly traced to cracker meal.

"The explanation given by some investigators was that the cracker meal contained old cookies and crackers that were taken from store shelves when they became too old. These were packaged in boxes made with recycled paper. In the recycling process, the ink and adhesives (containing PCB's) on the boxes were recycled along with the paper so that PCB levels gradually built up.

"When a carload of old crackers and cookies is gathered, it is sold to feed companies (usually small ones). Since too much labor is involved in removing the cookies and crackers from their packages, they grind up everything — including the wrappers. Then PCB's show up in the feed.

"PCB's have been found in animal by-products originating in Illinois, in spent layers in Mississippi which ate feed which originated in Oklahoma, and in turkeys in Minnesota — traced to animal by-products from a local rendering plant which were incorporated into feed.

"Fish meal imported from Peru at several U. S. points was found to be contaminated with PCB's.

"'The widespread reports of PCB contamination sound like somebody has perpetrated a great evil,' Mrs. Huston declares, 'but the reason these compounds are so widely used is that they are handy for so many jobs because they don't break down easily. This is what you look for if you're trying to build a better mousetrap. PCB's are considered to be inert, and it's their inertness that makes them valuable. But this is also the reason they remain in our environment and wind up in chickens.'

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"How PCB's suddenly hit the spotlight is well known in the poultry and egg industry (summer 1971). PCB's leaked from a screw-type container being used to kill salmonella in fish meal at East Coast Terminal, Wilmington, N. C. The contaminated fish meal was mixed with feed that was sold to poultry and hog producers in at least 12 states, although shipments to Indiana and Arkansas were reportedly stopped before being fed.

"The situation could have become more widespread and could have affected much more product had not Holly Farms, Wilkesboro, N. C., discovered high PCB contamination in breeder flocks consuming the fish meal. Low hatchability promoted its investigation.

"About 88,000 chickens were destroyed when first tests showed that PCB contamination exceeded 5 parts per million. (p.p.m.). USDA moved in to begin testing hens and broilers over the affected area, but on August 27 reported it had found only one lot of turkeys, one lot of hens and one hog containing more than the maximum acceptable levels out of 352 tests on hens, 126 on broilers, 143 on turkeys and 66 on hogs. PCB's found per million parts of total edible tissue were 0 to 5.3 in hens, 0 to 0.7 in broilers and 0 to 11.8 in turkeys.

"Thus began the "Great PCB Scare' that grabbed newspaper and TV headlines all across the country, sending fear into consumers that they might be eating 'contaminated' eggs or poultry meat."

The fact that PCB's are so widely used makes it difficult to pinpoint the cause, although the ingredient carrying the PCB in a feed, for example, is quite readily identified. When PCB is identified in poultry, as in Maine during the week of Feb. 21, ingredients are tested and if found contaminated the PCB carrying ingredient is eliminated. There are sources other than ingredients but this is the most common source.

In the case of poultry meat, PCB's presence is usually noticed, but not always, in live birds. Once identified in the birds, FDA makes every attempt to assure a pure product in the market. Live poultry, processed poultry, and stored poultry is tested and released if found to meet acceptable levels.

PCB contamination is regrettable, for both the industry and the public — but the harm to the industry and individual farmers far exceeds any potential danger to the public. Reduced poultry product consumption is unnecessary, but usually results from "scare" reaction rather than any logic.

The PCB "scare" in the South east last August was estimated to have cost the industry 8 to 10 million dollars. This loss was not for condemned products, (there were only four truckloads involved) the loss was in retail sales — and a decline in prices. The loss does nothing to correct the problem.

The recent PCB problem in Maine broilers may follow a similar pattern. It is hoped that the above will provide you with a basis for answering questions and result in more logic action and less "scare" reaction on the part of the consumer.

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