perspective
Purdue University

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That deadly alphabet soup

PCB's and PBB's, mixtures of several chemical isomers, may be industrially useful substances—but become potentially deadly alphabet soups if they sneak into the food chain as they can and have.

Two research projects involving Purdue animal scientists and veterinarians hope to shed additional light on their effect on food animals.

The two compounds are not only similar in name but also in chemical structure: PCB means polychlorinated biphenyl; PBB means polybrominated biphenyl. Both have gained considerable notoriety in recent months for their contamination of livestock and dairy herds.

For example, PCB's have been a problem for many southern Indiana dairymen. More than 140 were put on notice last summer that their marketed milk contained PCB's above the 2.5 parts-per-million level considered a safe maximum by public health officials.

PBB was a contaminant in livestock feed in Michigan in 1973 and led to great losses, many of them still being adjudicated. PBB's apparently got into livestock feed by mistake and showed up eventually in 42 different mills and required quarantine of 500 farms.

PCB's are used in plastics; PBB's are found in a commercial fire retardant used in the fabrics industry. They are structurally related to the chlorinated insecticides such as DDT and like DDT they accumulate and are stored in body fat and show up in cow's milk and egg yolks. They are potentially cancer causing.

In the Indiana dairy herds, contaminated milk was traced to cows who ate silage from silos constructed of cement staves sealed on the inside with a product containing PCB's. Fortunately, most silos constructed since 1971 are free of the contaminant.

In the Purdue projects, Drs. Farrel R. Robinson, professor of veterinary sci-

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PCB research continues

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icology and pathology, and Vernon R. Colenbrander, associate professor of animal sciences, are working with a dairy herd at the Southern Indiana-Purdue Agricultural Center at Dubois to determine the rate of change in the levels of PCB's in the body fat of the animals and the rate of change of the PCB level in the milk itself. (There is a distinct relationship between body fat and milk.) "We expect," says Dr. Robinson, "that the levels of PCB's will fall when the animals are removed from the source of contamination."

In the second project at the Lyngwood-Purdue Agricultural Center near Carmel, Indiana, a team is working with beef cattle to determine how long it takes the residue of PCB's in body fat to decrease, as well as what happens to the animals pathologically when contaminated.

The research involves three animal groups—a control group receiving only uncontaminated feed, a group receiving silage contaminated with PCB's, and a third group receiving clean silage but which is purposely laced with PCB's.

The experiments involve, as in the case of the dairy herd, a determination of the rate of decrease of PCB's as the animals are withdrawn from contaminated food, as well as the rate at which they absorb them and a discovery of what deleterious effects the compound has.

Involved with Dr. Robinson in this work are T. Wayne Perry, professor of animal sciences; Robert J. Everson, analytical chemist in the Purdue Animal Disease Diagnostic Laboratory; Kenneth Weinland, Purdue extension veterinarian; R. L. Morter, professor of large animal medicine; and Kern S. Hendrix, assistant professor of animal sciences.

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