REPORT OF THE COMMITTEE ON ENVIRONMENT

Chair: Dr. Gavin Meerdink, Urbana, IL
Vice Chair: Dr. Randall Lovell, Martinsburg, WV

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The Committee met on Saturday, November 5, 2005 in conjunction with American Association of Veterinary Laboratory Diagnostic (AAVLD) and Veterinary Analytical Toxicology and Mycotoxins Committee. Ninten Committee members were in attendance plus visitors.

Dr. Randall Lovell, Food and Drug Administration (FDA), Center of Veterinary Medicine (CVM), Division of Animal Feeds reported on dioxins and perchlorate in animal feeds. Twenty dioxin (D)/furan (F)/polychlorinated biphenyl (PCB) congeners were measured in yellow grease (waste fats and oils from restaurants) and in rendered fat from cattle, poultry, swine and mixed animal species (8-18 samples per commodity). The total D/F/PCB levels found ranged from 0 to 1.6 parts per trillion (ppt) toxic equivalents (TEQ). These levels were below the 3.0 ppt TEQ maximum residue limit (MRL) recently proposed by the European Communities (EC) for D/F/PCB in animal fat.

D/F/PCB levels were also measured in 111 samples of dairy feed, most of which were total mixed rations. The mean D/F/PCB level was 0.018 ppt TEQ and the range was 0 to 0.15 ppt TEQ. These levels in the dairy feed were well below the 1.50 ppt TEQ MRL that was recently proposed by the EC for D/F/PCB in most compound feedingstuffs.

Preliminary data on perchlorate levels in water and feed samples collected at 105 dairies were presented. Perchlorate levels in the water from the dairies did not exceed 3 ppt and were well below the 24.5 ppb standard that was recently established by the EPA in drinking water. Perchlorate levels in grains (primarily corn) were consistently lower than those found in hay silage.

In FY 2006, the FDA plans to collect and complete dioxin analyses on the following samples:

- anti-caking agents
- feed ingredients or bedding that likely contain wood or wood products
- feed ingredients in contact with or likely containing soil

Dr. Gavin Meerdink, Veterinary Diagnostic Laboratory University of Illinois reported on issues associated with the use of ethanol coproducts in animal rations. The amended Clean Air Act of the early 90's required that gasoline sold in urban areas contain at least 2 percent oxygen. Ethanol output increased more than 50 percent and 19 states banned the use of methyl tertiary butyl ether (MTBE), because of drinking water contamination. The MTBE ban further expanded ethanol demand. Some 3.4 billion gallons of ethanol were produced in the United States in 2004, a 21-percent increase over 2003. Eighty-eight dry-grind plants have been built within the last threedes and at least 16 new plants are under construction. Energy legislation passed in July 2005 requires petroleum refiners to blend 7.5 billion gallons of ethanol (about double the 2004 production) into gasoline by 2012. This amount of ethanol will consume approximately 25 to 30 percent of the nation's corn production. Increases in corn production are expected to cover this legislative edict. The co-products derived from ethanol production have become an important feed ingredient, especially for cattle. Marketing of these co-products provides essential income to offset production costs. (*Hess G: Ethanol wins big in energy policy. In Chemical & Engineering News 83(37) pp28-30, September, 2005*.)

Ethanol is produced from corn by either wet milling or dry-grind processing; the co-products differ between the two methods. **Wet milling** involves the fractionation into four components (i.e., starch, germ, fiber and protein) by first steeping the corn in a weak sulfurous acid solution to hydrate and soften the kernel to leach solubles from the germ. The starch component provides glucose, high fructose corn syrup, ethanol and other chemicals. The protein fraction is dried to corn gluten meal (CGM), which is high in protein and low in fiber. Corn gluten feed (CGF) from the fiber fraction (pericarp and cell wall fiber

components) has a respectable protein concentration (about a third of CGM) and high fiber. CGF is available in wet or dried form. In the **dry-grind** process, corn is first ground in order to subject the entire kernel to fermentation (to maximize ethanol yield and conserve process energy). The only co-product from the dry grind process is distillers dried grains with solubles (DDGS). The majority of ethanol is derived from the dry-grind process. (*Rausch KD, Belyea RL: The future of coproducts from corn processing. Appl Biochem & Biotech (In press) (used by permission of the author)*)

Corn gluten feed and DDGS co-products have become significant feedstuff components, particularly for ruminant diets (due to high fiber concentration). Their availability will increase in relation to the increase use of corn in ethanol production. Experience with these has revealed issues related to their use in animal diets:

All of these co-products vary from plant to plant and between batches for several nutrient components. The degree of nutrient variation from load to load may warrant more frequent analysis.

Phosphorus levels are high for CGF and DDGS. Total mixed rations should be monitored for Ca-P ratios for nutritional purposes and prevention of urolithiasis. (Be sure to consider wet weight v. dry weight analyses/conversions.)

Sulphur concentrations are invariably high. The resulting sulfates have been associated with increased incidence of polioencephalomalacia and copper deficiency.

Proximity to an ethanol plant is attractive in that it may warrant (the fuel cost) of hauling wet gluten or DDGS versus the more expensive dried products.

Robin Schoen, National Academies Press, announced the release of the National Academies Publication on Mineral Tolerances of Animals. He also released order forms for the new edition of the original 1980 publication. Release is scheduled for the end of 2005.

Aflatoxin was believed to be more common in the drought areas of the Corn Belt in the 2005 growing season. However, test surveys were not done for verification.

Guidelines or recommendations for mycotoxin concentrations in animal feedstuffs are published from various sources and do quote different values. This contributes to confusion in the animal industry. The Committees' will review and ratify the formerly adopted guidelines approved by FDA-CVM regarding mycotoxins, specifically fumonisins concentration in cattle feeds, to determine if still applicable.