REPORT OF THE COMMITTEE ON THE ENVIRONMENT

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The Committee met from 3:30 to 5:45 p.m. on October 20, 2007, at John Ascuaga's Nugget Hotel, Reno, Nevada. There were four members and 36 guests present. The following reports of current events were presented.

Melamine-Cyanuric Acid Pet Food Recall of 2007

History of the Recall

In early March, 2007, a company performing pet food palatability trials observed that several cats and dogs consuming the food became sick and a number of cats died shortly thereafter. At around this time, the company learned that wheat gluten imported from China was among the ingredients suspected of causing food problems. On March 16, the food company recalled approximately 60 million cans and pouches of wet food. On March 20, the Food and Drug Administration (FDA) confirmed 14 dog and cat deaths. On March 26, it is announced that melamine was discovered in the food. On March 30, melamine is announced as the leading suspect and wheat imports from the suspected company are restricted. At the beginning of April, 2007, one of the companies supplying wheat gluten to pet-food manufacturers recalls wheat gluten that had been imported from China. On April 5, the pet-food recall was expanded to include more products. On April 10, the recall was expanded further. On April 27, melamine in combination with cyanuric acid was reported to result in formation of crystals in the kidney and urine by the University of Guelph, Canada. On April 28, the United States Department of Agriculture (USDA) and FDA announced that a number of hogs had been fed melamine-contaminated feed. On April 30, the USDA and FDA announced that several million chickens had been fed contaminated feed. On May 7, the USDA and FDA issued a release with regards to the risk to humans in consuming meat from animals fed contaminated feed, concluding that there was a very low risk to human health in such cases involving pork and poultry. On May 18, remaining poultry were released from quarantine. On May 30, the FDA announced that two U.S. animal feed manufacturers had been adding melamine to feeds as a binding agent.

Summary of Disease

Through cooperation of numerous state and federal agencies, laboratories and private industries in the United States and Canada, it was discovered that melamine alone in feeds was not sufficient to produce injury in animals eating the contaminated products. Rather, a combination of melamine and cyanuric acid in the feed is required to produce disease. When both melamine and cyanuric acid are consumed in feeds, the two compounds precipitate together forming large crystals in the kidneys which produces severe, acute renal damage resulting in the deaths of some cats and dogs. In

experimental feeding trials, it was found that neither melamine nor cyanuric acid alone caused crystal formation or disease, but the crystals, clinical syndrome and lesions were reproduced in cats and swine using a combination of the compounds in the feed.

Summary of Presentations to the Committee

The American Academy of Veterinary and Comparative Toxicology (AAVCT) held a symposium entitled, Review of the Pet Food Recall of 2007: Melamine and Cyanuric Acid. Five speakers from the U.S. and Canada summarized events related the pet food contamination and recall. In addition, there were 5 platform and 1 poster presentations related to American Association of Veterinary Laboratory Diagnosticians (AAVLD) surveys on the numbers of confirmed animal cases, pathological findings, analytical methods development for melamine, cyanuric acid, and related chemicals, and on the results of experimental dosing studies. See the 2007 AAVLD Abstracts for details.

Biofuels and Animal Health Hazards

The potential of health hazards related to the feeding of grain co-products from ethanol and biodiesel production were reviewed. Since co-products are derived from a variety of crop sources and different processes, confusion over the acronyms and names does exist. Distiller's dried grains with solubles (DDGS), corn gluten feed (CGF) and corn gluten meal (CGM) are common terms for corn co-products, but other terms, including distiller's grains and brewers dried grains, exist. Wet milling and dry grind methods are most common in the conversion of corn to a wide variety of products including the co-product ethanol. By far, most of the ethanol and DDGS is from dry grind plants. CGF and CGM co-products are derived from the wet milling process.

Approximately two thirds of the corn kernel is starch which is converted to ethanol. The remaining third of the kernel along with whatever comes with the kernel comprises DDGS. Thus, this co-product contains approximately three times the component concentrations of the original corn (minus the starch). Millions of tons of DDGS have been fed to livestock for many years. Variability has arisen as a concern. DDGS composition change associated with corn hybrid variety or growing conditions have been shown to be of minor concern. More significant variation in the DDGS co-product can occur related to differences in the production process. Within plant variations are smaller than the differences between plants. The co-product purchaser should make inquiries. Health effects have not been reported resulting from this variation, but nutritional concerns cannot be dismissed. As always, dietary changes should be made gradually.

Phosphorus (P) concentrations, approximately 0.3 % (dry matter) in corn, are about three times higher in DDGS and CGF co-products. Particularly when fed in a significant ration percentage, calcium (Ca) and P, as well as magnesium (Mg), should be monitored to assure appropriate mineral ratio. Urolithiasis has occurred when Ca:P ratios were inverted. Cases have also occurred when the co-product source was switched from wet to dry. Excess Mg may also be a complicating factor.

Sulphur concentrations in DDGS and CGF approximate 0.25 % to 0.33 %. Feed concentrations in this range are associated with a higher incidence of

polioencephalomalacia in naive cattle. Additional copper and gradual adaptation of arrival animals helps to reduce the incidence.

Mycotoxins, three-fold higher in the co-product than the incoming corn, are an important consideration. Dairies, in particular, have experienced problems from aflatoxin B_1 residues in milk. Fumonisins are an important consideration if these materials are to be fed to horses.

Lactrol® (virginiamycin and dextrose) is manufactured by PhiBro Animal Health (the sole producer of virginiamycin) for use in the fermentation process to control bacterial proliferation which impairs fermentation and optimum ethanol production. The FDA is empowered by the Food, Drug and Cosmetic (FDC) Act which does not cover industrial alcohol production. Thus, ethanol fermentation performance aids cannot be approved by the FDA. Lactrol has been FDA reviewed and assigned a no objection status concerning use in industrial alcohol production and the use of resulting distillers' by-products in stock feed. Testing (for the M_1 component of virginiamycin) of DDGS in the US and Canada showed no residues detectable to the 1 ppm test limit. FDA has determined virginiamycin use in food animals does not present a significant transferable antimicrobial resistance risk. FDA has reviewed Lactrol use and resulting distillers by-products, and has issued the only formal no objection status for an antibiotic ethanol fermentation performance additive.

Biodiesel has gained prominence more recently. The primary source, at this time, is soybeans, however, other lipid sources from animal or plant sources or recovered waste oils are potential sources. The co-products from the biodiesel manufacture is questionable and depends on the sources used and their lipid purity. High amounts of glycerin (or glycerol) from triglyceride catabolism are created. This material can be fed to cattle, diet inclusion optimum levels are under study for cattle type. Methanol used in the conversion process is present in the co-product and its concentration is subject to regulation. A human diet limit is 150 ppm. Animals, particularly ruminants, are less sensitive to the effects of methanol than are humans. In fact, methanol is the source of methane released from the rumen. Depending on the sources used, residues such as dioxins and polychlorinated biphenyls **(**PCBs) could be a consideration in the use of these biodiesel co-products. Certainly, the production of biofuels is still evolving. Changes in sources such as cellulose materials and improvements in extraction for higher value products will continue. The safe use of these co-products for livestock production rests upon the user. Producers should develop a relationship with the source plant and stay appraised of product changes.

Annual Mycotoxin Report from the States

Fumonisins were a common finding in most of the crop production states in 2007. Although common, high concentrations (i.e., >10 ppm) were rare. In the southern grain belt where aflatoxin is routine the rainfalls this season evidently relieved some crop stress and concentrations of this mycotoxin were lower than usual. As usual, aflatoxin was detected in various foci where climate stress on crops favored production. Zearalenone and deoxynivalenol (DON) findings were consistent with past years.

More DDGS samples were run in the last year. As one might expect since the co-product represents three-fold increase of the source corn, levels of aflatoxin, fumonisin, zearalenone and DON were detected at levels higher than were found in corn.

Large scale health problems were not reported for the last year.