

metabolites. A new strain belonging to the genus of Eubacterium isolated out of rumen fluid of cattle is able to deactivate trichothecenes by reduction of the epoxide ring. This mode of action was proven in vitro and also in vivo by applying trichothecenes and the detoxifying strain Eubacterium BBSH 797 to chicken. In a very recent project a novel yeast strain, capable of degrading ochratoxin A and zearalenone was isolated and characterised. Due to its affiliation to the genus of Trichosporon and to its main property to degrade mycotoxins this strain was named Trichosporon mycotoxinivorans. This strain showed detoxification in vitro and in vivo. Together with clay minerals Eubacterium BBSH 797 and Trichosporon mycotoxinivorans can be used in a formulation to prevent poultry from mycotoxicoses caused by aflatoxins, trichothecenes and ochratoxins.

Key Words: Mycotoxins, Deactivation Strategies, Microorganisms

4 Withdrawn by author. , .

5 Avian Influenza, Vaccines and Control. D. Swayne*, *US Department of Agriculture, Agricultural Research Service, Southeast Poultry Research Laboratory, Athens, GA.*

Avian influenza (AI) is a viral disease of birds caused by type A orthomyxoviruses. Avian influenza viruses are further classified into 15 different hemagglutinin (H1-15) and 9 different neuraminidase (N1-9) subtypes. Biologically, AI viruses can be of low (LP) or high pathogenicity (HP) for chickens and related poultry species. Dealing with AI

has focused on one of three goals: prevention, management (control) or eradication. In most developed countries, LPAI and HPAI are not common in commercial poultry and thus prevention is the primary goal. However, if AI occurs, eradication is the overall goal with epizootics of HPAI being eradicated through a strategy that includes enhanced biosecurity, surveillance or diagnostics to identify infected farms, quarantine of infected premises, depopulation and disposal of infected poultry, and cleaning and disinfection of infected premises. Vaccines have been used to manage economic losses from LPAI or, in some instances, have been used as a tool in LPAI or HPAI eradication strategies. AI vaccines can prevent clinical signs and death in poultry, increase resistance of birds to infection, and decrease the amount of virus shed in the environment. However, vaccines alone will not eradicate AI. High pathogenicity AI impacts international trade as does some forms of LPAI. Experimental studies in chickens have shown that LPAI viruses cause respiratory and gastrointestinal infections without infecting the meat. By contrast, HPAI viruses produce infection of respiratory and gastrointestinal tracts, produce a viremia and virus is present in the meat and internal contents of eggs during the acute stages of the infection. Additional experimental studies have demonstrated that pasteurization of liquid egg products using USDA guidelines will inactivate HPAI virus that have been artificially added to levels in excess of those reported in eggs laid by HPAI virus-infected hens. Although, no virus has been demonstrated in internal contents of eggs laid by LPAI virus infected hens, pasteurization has been shown to inactivate LPAI virus artificially added to egg products.

Key Words: Avian Influenza, Vaccine, Trade

Combined Animal, Dairy and Poultry Extension Workshop

6 Washington update. R. Reynnells, *National Program Leader, Animal Production Systems, USDA-CSREES.*

The 2004 Annual Extension Special Recognition Award is presented to Dr. Mike Hulet, (PA), who has made many significant leadership contributions in the areas of environmental protection and animal well-being. Muquarrab Qureshi joined us as National Program Leader (NPL) for Animal Genetics. Our NPL position for Veterinary Medicine continues to be available. I want to encourage you to participate in multi-state research committees, which will increase in importance with our ever-reducing number of poultry faculty. WCC-204, Animal Bioethics, is an important committee that complements other activities at Land Grant Universities. The Southern Region Poultry Extension Workshop (Triennial) committee is more national in character and continues discussions of scheduling changes. John Carey (TX) is Chair, and Ken Anderson, Vice Chair of that committee and they request you provide comments and volunteer. The 2004 National Poultry Waste Management Symposium is in Memphis, and is coordinated by Mike Hulet (PA); with Susan Watkins (AR) Coordinator for 2006. The Future Trends in Animal Agriculture held a program in 2002 (Standards), two in 2003 (Science and Ethics; and, Costs of Changes), with another scheduled for 2004 (Local and Global Considerations) to create opportunities for positive dialogue between industry and activists. Proceedings are available. The National Poultry Infobase will be terminated in 2004. A national Regionalization Workshop prioritized mechanisms to implement effective programs. Proceedings are available.

Key Words: Recognition Award, Animal Well-Being, Triennial Workshop

7 Confined Animal Feeding Operation (CAFO) regulations impact and record keeping requirements for livestock operations. G. E. Erickson*, R. Koelsch, C. Shapiro, and C. Wortmann, *University of Nebraska, Lincoln.*

In 2002, USEPA revised regulations for confined animal feeding operations (CAFO) to appropriately update federal requirements in the 1972 Clean Water Act, and specifically the National Pollutant Discharge Elimination System (NPDES). The goal of the revised regulations is to ensure clean surface water in the US. The revisions address runoff control, manure storage, nutrient utilization, and record-keeping and related livestock water quality issues. CAFO is defined by facility, risk of nutrients entering water, and size. Large CAFOs have at least 1000 cattle, 700 dairy, 2500 finishing swine, or 125,000 broilers. Smaller operations can be designated as a CAFO under some circumstances. By December 31, 2006, nutrient management plans (NMP)

and record keeping are required for CAFOs. The USEPA requirements are the minimum requirements to which individual States must respond. State requirements may be more demanding and comprehensive than the minimum established by USEPA. Comprehensive Nutrient Management Plans (CNMP) are defined by USDA to monitor nutrient flow, minimize excretion, appropriately utilize nutrients, and keep records. CNMPs are more comprehensive than NMP and address feed management and alternative uses or technologies for managing manure. NMP records that must be maintained for five years include: the annual NMP, analysis of manure and soils receiving application, crop nutrient requirements, the basis for determining the rate of application, dates and methods of application, amounts of N and P applied, and a cropping season summary. The USEPA regulations require that CAFOs submit an annual report. USEPA is allowing the States to determine the threshold at which manure application rates can no longer be based on crop N need or removal and P-based application are required. This threshold is affected by several that define the potential for runoff P loss from individual fields. Considerable education efforts are underway nationally, regionally, and through land-grant institutions.

Key Words: Nutrient Management, Regulations, Animal Feeding Operations

8 Waste management alternatives: composting, methane production and other options. L. E. Carr, *University of Maryland, College Park.*

This presentation will address waste management alternatives to include: composting manures and normal mortalities from animal and poultry production systems; methane production from various manures and potential utilization of the end products; processing poultry and turkey litter for organic fertilizer and value added fertility products; and direct combustion. Process feedstocks will be limited to cattle, swine, horse and poultry manures/litter and normal mortalities. The carbon to nitrogen ratio of some manures are in the desirable range while others will have to be adjusted with a carbon source for good composting and methane production. Methane is not a readily compressible gas which creates some storage limitations, therefore, direct contentious use of the gas as it is generated will be discussed. In this process, the nutrient content of the feedstock changes very little which will have to be utilized properly upon discharge from a digester. Litter from broiler and turkey production are ideal for further processing into organic fertilizer and other value added fertility products because they are from dry production systems with a high NPK content. In recent years, there has

been a lot of activity in direct combustion of poultry and turkey litter. A review of on and off farm combustion systems will be presented. Each of the alternatives shown will have their pros and cons and will be discussed.

Key Words: Waste Management, Composting, Organic Fertilizer, Combustion

9 Air quality, PM_{2.5}, and related concerns. F. M. Mitloehner, *University of California, Davis.*

Public concerns related to air quality impacts of intensive livestock and poultry operations have grown drastically over the recent years. Pollutants of concern are particulate matter, ammonia, methane, hydrogen sulfide, volatile organic compounds, and odors. However, there is a general paucity on character, amount, and dispersion of livestock air pollutants. Despite dramatic knowledge gaps, the Environmental Protection Agency (EPA), State and local air quality agencies are mandated to use best available emission factor data for their emission inventories. In serious non-attainment regions like the San Joaquin Valley, pollutants like particulate matter and ozone precursors have to be reduced significantly. New legislation forces livestock producers to reduce emissions using best available control methods that for the most part were never scientifically tested. The US Department of Agriculture (USDA) is mandated to support farmers with scientifically based emission mitigation techniques and technologies but again scientific information is scarce. Both, EPA and USDA appointed the National Research Council (NRC, 2003) to review the scientific basis for current emission estimates and emission mitigation. Major NRC findings were that current emission estimates are largely inappropriate because instead of being based on representative surveys from a class of operations (e.g., dairies) over several seasons, they are predominantly grab-sample measurements conducted on one operation at one time. The committee recommended replacing the current emission factor approach with the use of process-based modeling using nutritional mass-balance approaches. A second major NRC finding was that intensive research is needed into cost effective emission mitigation for livestock and poultry operations.

Key Words: Air Quality, Emission Mitigation, Emission Estimates

10 Water quality concerns—are they real? What needs to be done? T. G. Gunter*, *Oklahoma Department of Agriculture, Food, and Forestry.*

Many states continue to debate the question of whether or not animal agriculture is the cause of water quality pollution concerns. Using Oklahoma as an example, animal agriculture's potential impacts on water quality are often stated as the driving force behind legislative enactments restricting the activities of livestock or poultry operations. While animal agriculture can be a contributor to water quality problems, in many cases the real reason for the changes are related more to social or quality of life issues instead of water quality. Unfortunately, no matter what the state response is and no matter what the real reasons are behind that response, the results are livestock producers feel they are unfairly blamed for the entire problem and are subject to increasing regulation. Producer response to that regulation is ongoing and is likely

to shape the continuing evolution of animal agriculture in the U.S. and the world. This paper will provide the reader with an overview of Oklahoma's experience with the evolving world of livestock production, the state's reactions to real and perceived problems, producer reactions, and the future of animal agriculture and water quality.

Key Words: Water Quality, Livestock, Animal Agriculture

11 Urban encroachment and how Extension can assist farmers. K. S. Kremer, *Wartburg College, Waverly, IA.*

Development in the rural fringe of urban areas has eliminated both farm and timberland. While an assumption is often made that urbanization is destiny, this paper suggests communities, groups, and individuals can act to modify trends. This includes a role for university extension in their work with producers and communities.

Key Words: Urban Sprawl, Agricultural Change, Communities

12 Assimilation vs. accumulation of macro- and micro-nutrients in soils: relations to livestock feeding operations. N. A. Cole*, R. C. Schwartz, and R. W. Todd, *USDA-ARS Conservation and Production Research Lab, Bushland, TX.*

Amending soils with animal manures is a common practice to increase soil quality and dispose of potential wastes from concentrated animal feeding operations (CAFO). However, improper application of manure can result in runoff of nutrients or pathogens to surface water, percolation of nutrients to ground water, accumulation of nutrients in the soil, or loss of N and C to the atmosphere. The trend toward larger animal feeding operations has resulted in higher rates of manure and litter application in localized areas; thus, increasing the potential for pollution from land applied manure. With the advent of the new clean water regulations, all CAFO and many smaller AFO must have comprehensive nutrient management plans designed for proper utilization of manure nutrients. However, only 20 to 50% of CAFO have adequate land to meet application standards. The capacity of soils to accumulate nutrients, as well as the nutrient composition and phytoavailability of manures, vary greatly. In some cases, nutrients can accumulate in soils to the point of being toxic to plants. Application of manures to pastures is normally not sustainable because less than 20% of the nutrients applied leave the field in animal products. However, when forage is cut for hay or silage, appreciable quantities of applied nutrients can be exported. Areas adjacent to CAFO can receive large quantities of nitrogen via dry or wet deposition. These can be advantageous to some crops, but may be detrimental to plants sensitive to nutrient inputs such as native range or forests. Speciation data indicate that the relatively nontoxic dietary organic form of As (ROX) can be converted to the more toxic As(V) form in soils. For optimal sustainability, fertilization levels need to be balanced with plant requirements. However, even under the best management systems some accumulation or escape of nutrients is inevitable. Therefore, nutrient management plans must recognize the need to deal with nutrients that accumulate in soils or leave the field or production area.

Key Words: Manure Nutrients, Soil, Assimilation

Growth and Development: ASAS-Emerging Roles of Gut Peptides in the Regulation of Appetite and Metabolism

13 Role of PYY in Appetite Regulation during Obesity. C. W. le Roux*¹, S. Shurey², R. P. Vincent¹, M. A. Ghatge¹, and S. R. Bloom¹, ¹*Department of Metabolic Medicine, Imperial College London Hammersmith Hospital, London, UK,* ²*Experimental Surgery, Imperial College London Northwick Park Hospital, London, UK.*

PYY is present throughout the gastrointestinal tract, with the highest tissue concentrations in distal segments. PYY is released into the circulation following food intake and postprandial concentrations is proportional to meal size, with peak plasma levels appearing in the second hour. PYY reduces gastric emptying and delays gastro intestinal transit. Chronically elevated PYY have been described in several gastrointestinal diseases associated with loss of appetite. More recently, PYY has been demonstrated to have a physiological action inhibiting food in-

take through its action on the NPY Y2 receptor in the arcuate nucleus. Bariatric surgery remains the most effective treatment for obesity. In a rodent model of intestinal bypass PYY was elevated in the bypass compared to the sham bypass group. Humans following Roux-en-Y gastric bypass surgery for the treatment of obesity also have higher postprandial PYY responses and this might contribute to their increased satiety. In contrast, obese subjects treated with gastric banding had equivalent initial weight reduction, but do not demonstrate similar hormonal changes. The weight loss following gastric banding is not as long lasting as that observed after gastric bypass. Obese humans and diet induced obese mice have reduced fasting and an attenuated post-prandial PYY response. A greater meal calorie content is required to achieve similar PYY concentrations in obese compared to lean humans; postprandial satiety was also less in the obese. Infusions of exogenous PYY at increasing doses across the physiological range produced a graded increase