Safety of Our Meat Supply: Assessing the Risks and Methods of Control

854 Risk assessment of pre-harvest food safety: a quantitative approach. S.A. McEwen*[1], [1]*Department of Population Medicine, Ontario Veterinary College, University of Guelph*.

This presentation will demonstrate how pre-harvest food safety risk assessment can be used to guide regulatory decision-making, help to establish policies and standards, and explore impacts of different risk-reduction options. The strengths, limitations and demands of risk assessment in the pre-harvest area will be discussed, using actual examples concerning E. coli O157:H7, and antimicrobial resistant bacteria.
We used a quantitative model to assess the benefit of measures implemented in the pre-harvest period that are aimed at reducing the contamination of beef carcasses with E. coli O157. Control measures that were assessed were based on either a reduction in herd prevalence of infection, reduction in opportunity for cross-contamination, reduction of concentration of E. coli O157 in fresh feces (by vaccination or other method), or a reduction in the amount of feces, mud and bedding ("tag") transferred from the hide to the carcass. Risk assessment is also being used in regulation of veterinary drugs, which will be the focus of the second example. FDA scientists have prepared and publicly presented a risk assessment on the human health impact of fluoroquinolone resistant Campylobacter associated with the consumption of chicken. Alternative approaches have been proposed and their stregths and limitations will be dicussed.
Demands to enhance pre-harvest food safety continue to mount as microbial and chemical crises occur with amazing regularity around the world. Those concerned with managing risks at the farm level are often pressed to identify which risks can and should be addressed at that level, and at what cost. Risk assessment is gaining acceptance as a valuable tool because of the difficulty in making sound public health decisions in the face of complexity, uncertainty and varying scientific and public opinion. There is a compelling case for a decision-making process that is open and based on scientific evidence, economic analysis and wide consultation with due consideration of societal values.

Key Words: Risk assessment, Food safety, Pre-harvest

855 Pre-harvest Food Safety. J.E. Marion*, *National Chicken Council, Stuart, VA*..

The importance of food safety considerations prior to the slaughter of food animals has been recognized for centuries. It was first recognized that healthy food animals would yield safe food animal products if proper slaughter and processing techniques were followed. Diseases of animal origin that could be transferred to humans have been largely brought under control by vaccines, management, etc. during the past two centuries. During the mid-20th century, food animals were recognized as potential carriers of chemical residues, and programs are now in place to monitor and reduce such residues. More recently, food borne organisms that affect humans, but not necessarily animals, are being targeted for reduction in numbers and incidence. A most recent foods situation involves bovine encephalopathy (BSE) in European cattle and its' possible relationship to a human form of the disease. All the above situations bring us to a full realization that food safety is a farm-to-table concept that demands programs beyond those for slaughtering and processing. We are compelled to consider all phases from pre-harvest to the consumers plate, and to consider related issues such as environment and waste management. The Hazard Analysis and Critical Control Points (HACCP) approach has been employed by industry and regulatory agencies to accomplish a reduction in food borne pathogens and to model meat and poultry inspection for food safety and wholesomeness aspects. HACCP in poultry plants appears to be successful and will likely be used in broader based programs from the farm to the table. HACCP and other programs will be discussed to illustrate progress in food safety , and to point out areas, especially in preharvest, that need attention. A specific industry program for pathogen intervention will be discussed.

Key Words: Food Safety, Slaughter and Processing Techniques, HACCP

856 Future directions for FSIS and food safety. K. Hulebak*, *USDA Food Safety and Inspection Service, Washington, DC*.

With HACCP now fully implemented nationwide, FSIS is developing a roadmap to enable it to build upon the improvements it has made so far in the safety of meat, poultry, and egg products. Next steps are being considered in many different areas. For example, FSIS has begun to consider and discuss with its stakeholders how the agency's chemical residue program might change as it becomes part of the HACCP approach to ensuring food safety. Through the Workforce for the Future initiative, FSIS plans to implement an ambitious human resource program emphasizing the further development of one of its most valuable resources—the public health professionals who work throughout the agency as inspectors, consumer safety officers, veterinarians, microbiologists, and lawyers, among others. Undertaking reviews of the scientific bases for performance standards will be another important activity within the coming several years. With respect to inspection, FSIS is pursuing a risk-based approach. Education initiatives all along the farm-to-table chain will play a role in FSIS' next steps. And research and risk assessment, the critical underpinnings of all of FSIS' regulatory activities, are receiving ever-increasing emphasis. FSIS is working to enhance its traditional relationship with USDA's Agricultural Research Service, is developing new relationships with USDA's Cooperative State Research, Education, and Extension Service, and is establishing a new Risk Assessment Center to spearhead new risk assessments for Salmonella Enteritidis, Listeria monocytogenes, and E. coli O157:H7. FSIS has initiated a wide-ranging dialogue with stakeholders to explore these next steps.

Soybeans in Monogastric Nutrition

857 Nutrient composition and processing of soybeans impact the nutritional value of resultant soybean meals. C. M. Grieshop* and G. C. Fahey, Jr., *University of Illinois, Urbana, IL/USA*.

It is vital that raw soybeans contain an optimal nutrient profile if the highest quality soybean meal is to be produced. Both soybean composition and processing conditions impact the nutritional quality of soybean meal. In a comparison of soybeans grown in a variety of locations around the world and representing diverse environmental conditions, significant differences in chemical composition (e.g. crude protein, amino acids, and lipid) were noted. These differences could impact the nutritional value of the resultant soybean meals. Little information is available on the impact of processing conditions (e.g. processing time and processing temperature) on the chemical composition and nutritional value of soybean meal. Soybean meals obtained from a large number of U.S. soybean processing plants varied in crude protein, lipid, and amino acid concentrations. Indicators of nutritional value (e.g. protein solubility in potassium hydroxide, urease activity index, and protein dispersibility index) are commonly used to rank soybean meals. United States soybean meals from many processing plants exhibited significant differences in these characteristics. Optimization of both soybean quality and processing conditions is necessary to produce optimal quality soybean meal that will allow for maximal digestibility and growth performance of animals.

Key Words: Soybean, Soybean meal, Nutrient quality

858 Digestibility of amino acids in soybean meal for poultry. C.M. Parsons*, *University of Illinois, Urbana, IL USA*.

The digestibility of amino acids (AA) in well-processed soybean meal (SBM) for poultry is quite high, with mean digestibility coefficients being 90% or higher. Decreased digestibility of AA is usually due to either insufficient or excess heat processing. Inadequate heat processing results in decreased digestibility of all AA, whereas excess heating usually results in decreased digestibility of only Lys primarily. The reduction in Lys digestibility is due both to destruction of the AA and decreased digestibility of the Lys that is not destroyed. The protein efficiency ratio (PER) growth assay, slope-ratio growth assay and digestibility or balance assays such as the precision-fed cecectomized rooster assay or the chick ileal digestibility assay are all sensitive for measuring bioavailability or digestibility of AA in SBM. A great advantage of the digestibility assays is that all analyzable AA can be measured in the same assay.