

Draft
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The Future of FSIS Veterinarians: Public Health Professionals For the 21st Century

This Draft Report represents the work-in-progress of a Task Force composed of a diverse group of individuals including veterinarians from inside and outside of FSIS, a variety of FSIS management personnel, and individuals affiliated with academe, non-government organizations and foreign governments, convened in early 1999. A public meeting to discuss the Draft Report will be held February 1, 2000, at the Washington Plaza Hotel, Washington, D.C.

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EXECUTIVE SUMMARY

In 1999, the leadership of the Department of Agriculture's Food Safety and Inspection Service (FSIS) convened a select panel of individuals charged with examining how veterinary medicine, and the profession representing the art and the science of veterinary medicine, should be utilized in food safety. This Blue Ribbon Task Force was made up of a diverse group of individuals including veterinarians from inside and outside of FSIS, a variety of FSIS management personnel, and individuals affiliated with academe, non-government organizations (NGOs) and foreign governments. The findings and recommendations herein contained embody the collective thinking of all perspectives represented on the Task Force. The Task Force met numerous times through 1999 and has concluded its efforts in the following report.

The Task Force Members hope the reader will view their findings as a fundamental work that establishes a considered baseline of reasoning about the role of veterinarians in public and animal health, and food safety that must be continuously reconsidered and reevaluated. The role of the veterinarian as the purveyor of knowledge and expertise that will act as the foundation for the bridge between agriculture and medicine is paramount. Therefore the intent of this report is to fuel a renaissance in thinking about how veterinary medical expertise is considered, but more importantly how veterinary medical expertise is cultivated, nurtured, and utilized.

The profession of veterinary medicine, and the individual veterinarians representing the profession, are continually evolving with the discovery of new knowledge. Therefore in the final analysis the question will be how society is best served through the sustained use of the appropriate knowledge and expertise available in order to achieve the maximum safety in the food supply at a reasonable cost. The following pages contain five issue areas that the Task Force considered predominant for immediate consideration. The following recommendations will require a complete recasting of how the veterinarian is viewed inside and outside the Agency and even the individual veterinarian's view of him or her self will change. The suggested changes are not without difficulty and will require great work and diligence by leadership and the workforce. Nevertheless, hard labor produces great results and the Department of Agriculture's Food Safety and Inspection Service of the 21st century will be born.

In 1996, the Food Safety and Inspection Service (FSIS) issued the Pathogen Reduction; Hazard Analysis and Critical Control Point (HACCP) Systems final rule to control and reduce pathogens (harmful bacteria) on meat and poultry.

Federal and State meat and poultry plants must adopt HACCP, a system based on hazard prevention, with performance standards set by FSIS. Effective implementation of HACCP by industry will ensure safe food and should alter relationships with FSIS. Astute utilization of veterinary resources will enhance farm-to-table food safety. FSIS employees increasingly make science-based judgments that impact a broad range of entities.

Despite major changes, many still perceive FSIS veterinarians employed in the field as technicians rather than as public health professionals. Their role remains unclear. To meet its mandate for the 21st century, FSIS must better utilize the skills and talents of its current veterinary workforce and enhance efforts to recruit and retain highly qualified and motivated veterinarians in the future.

The Task Force developed recommendations around five major issues, which are discussed in detail later in this report. The issues are:

- I. DEFINING THE ROLE OF THE FSIS VETERINARIAN
- II. EDUCATION, TRAINING, RECOGNITION AND RECRUITMENT
- III. PARTNERSHIPS
- IV. COORDINATED DATABASES AND ANIMAL IDENTIFICATION
- V. VETERINARY CONTRIBUTIONS TO INTERNATIONAL CREDIBILITY OF FSIS

INTRODUCTION

In 1996, the Food Safety and Inspection Service issued the Pathogen Reduction; Hazard Analysis and Critical Control Point (HACCP) Systems final rule to control and reduce pathogens (harmful bacteria) on meat and poultry. Federal and State meat and poultry plants must adopt HACCP, a system based on hazard prevention, with performance standards set by FSIS.

The rule gives all FSIS employees a much greater role in food safety and public health. FSIS employees increasingly make science-based judgments. Previously, FSIS relied on prescriptive regulations, using organoleptic (sight, smell, touch) inspection. In-plant veterinarians were primarily limited to inspecting animals before and after slaughter, detecting lesions, residue testing, supervising food inspectors, and performing other procedural duties. While these functions served the American public well, implementing HACCP and

striving for farm-to-table food safety provide new opportunities to utilize FSIS's veterinary expertise to improve public health.

Despite major changes, many still perceive FSIS veterinarians employed in the field as technicians rather than public health professionals. Veterinarians have successfully filled most scientific, technical and leadership positions in FSIS, yet their contributions remain unrecognized and their future role remains ill-defined. To meet its mandate for the 21st century, FSIS must better utilize the skills and talents of its current veterinary workforce and enhance efforts to recruit and retain highly qualified and motivated veterinarians in the future.

FSIS veterinarians can enhance food safety from farm to table by interacting more with other animal and human health professionals, promoting interactive quality systems and better information flow, integrating better scientific analysis of complex information with improved performance, enhancing public health through better use of resources, and making scientifically credible decisions.

PURPOSE AND SCOPE

The Food Safety and Inspection Service convened a Task Force to look at *The Future of FSIS Veterinarians: Public Health Professionals For the 21st Century*. The Task Force was charged with developing recommendations on the roles of veterinarians in meeting the Agency's needs, particularly with the implementation of HACCP systems and pathogen reduction requirements for meat and poultry. Moreover, the Task Force planned to look beyond current statutory and regulatory limitations to a visionary future. FSIS Administrator Tom Billy asked the Task Force to focus on the following areas:

- ◆ Define how veterinarians can contribute to the Agency's vision of risk-free food.
- ◆ Identify the opportunities to best utilize the FSIS veterinarians to optimize public health from farm to table.
- ◆ Assess the impact of HACCP on the duties and role of veterinarians.
- ◆ Identify expertise needed by the Agency as it relates to skills possessed by veterinarians.
- ◆ Define the international role of veterinarians, and assess the implications within the international community.
- ◆ Identify potential uses of technology.

THE TASK FORCE

The Task Force has 23 members from FSIS (both headquarters and field), other Federal and foreign agencies, associations, and universities. It includes veterinarians and others who can help identify the role of veterinarians in the context of Agency needs. The Task Force Co-Chairs are Dale Boyle, DVM, Executive Vice President, National Association of Federal Veterinarians, and Ronald Hicks, Deputy Administrator, Office of Management, FSIS. A brief biography of each Task Force member appears in Appendix B.

BACKGROUND

History

Government inspection of meat began in Europe, supported mainly by physicians. In Germany between 1779 and 1819, Johann Peter Frank, a pioneer in social medicine, emphasized the need for central slaughter in public abattoirs with inspection of slaughter animals and meat for zoonotic diseases by specially trained veterinarians. In Dresden, Germany, Friedrich Kuchenmeister developed scientific meat inspection by veterinarians.

In England, in 1862, veterinarian John Gamgee led a commission which recommended a national system of specially trained veterinarians to inspect meat sold in public trade. France, Austria and Prussia also were developing meat inspection systems. By 1880 in England and continental Europe, the role of veterinarians was being accepted by physicians, demanded by society and implemented into law by politicians. Robert Van Ostertag, the “Father of Veterinary Meat Inspection,” developed a rigorous scientific inspection program in Berlin in the 1890s. He wrote: “Veterinarians must do the important tasks of food hygiene for public health.”

In the colonial United States, raising livestock and marketing meat was a local activity. Often, people grew their own food and raised a few livestock. Consumers generally knew the source of their food. Writings, but little action for safety inspection of meat from zoonotic diseases (diseases communicable from animals to humans), appeared as early as the 1600s. In 1642, a Boston city ordinance placed animal slaughter under city control. In 1879, the Board of Health of Brooklyn appointed the first veterinary inspector, Lachlan McLean, who advocated that veterinarians be in charge of meat inspection.

By the mid-1800s, U.S. cities were growing. Transportation systems developed and increased the distance between food production and consumers. Meat was

produced in large packing plants, shipped in interstate commerce and exported to Europe. In the late 1800s, England restricted importation of U.S. cattle for slaughter and several European countries excluded U.S. pork because of *Trichinella*. In 1890, the U.S. enacted a law requiring veterinary inspection of live animals for export and inspection of cured meat for both export and interstate commerce. While the act was comprehensive, its application to domestic trade was limited. However, the "Guide to Practical Meat Inspection," written in 1900, stated that the act "opened the way whereby the veterinarians are the profession appointed for this work. Therefore the practice of meat inspection rests in the hands of veterinarians." Specially-trained "stock inspectors" were also authorized to be "to the veterinarian what the nurse or midwife is to the physician." The act was amended in 1891 to establish the Federal Meat Inspection Service as part of the Bureau of Animal Industry in the U.S. Department of Agriculture, and to require antemortem (before slaughter) and postmortem (after slaughter) inspection for meat for export. The act was further strengthened in 1895, with stricter inspection requirements for interstate transport of meat.

The Meat Inspection Act of 1906 signaled the real beginning of domestic meat inspection in the United States. A year earlier, Upton Sinclair published *The Jungle*, portraying unsanitary conditions in Chicago slaughterhouses. The book caused a public and political outcry. Meat sales around the country dropped nearly a third. The 1906 Act began a system of continuous veterinary inspection in slaughterhouses. It called for mandatory inspection of all meat and meat products moving in interstate commerce. It required antemortem and postmortem inspection of cattle, hogs, sheep, and goats. It established sanitary standards for slaughter and processing facilities. The inspection workforce in packing plants became teams of inspectors specifically trained to separate abnormal animals at antemortem and abnormal carcasses at postmortem. Veterinarians with advanced training in inspection further examined the separated animals and carcasses and made final dispositions. Veterinarians also collected tissues for laboratory examination, prepared records and submitted reports. This model has been continued in the United States through subsequent meat and poultry acts.

At that time, there were 163 plants under Federal inspection; there are now over 6,000. In 1927, Congress created the agency that later became the Food and Drug Administration (FDA). FDA remained in the Department of Agriculture until 1940. The FDA has authority for all foods not covered by the Meat and Poultry Products Inspection Acts.

The first attempts at poultry inspection began in 1926. Until then, many consumers bought their poultry from farmers or markets, either live or "New York dressed" with only the blood and feathers removed. Consumers eviscerated poultry just before cooking. Voluntary poultry inspection began in 1926, with

canning plants seeking most of the inspection. By the 1930s, the industry produced ready-to-cook poultry. World War II increased demand for poultry products. The military had its own specifications and required either its Veterinary Corps or USDA to inspect all poultry products consumed by the armed forces. Congress conducted many hearings on poultry inspection and in 1957 passed the Poultry Products Inspection Act, which established mandatory antemortem and postmortem inspection of poultry entering interstate commerce and mandatory inspection of slaughter and processing facilities.

The major revisions in the slaughter and inspection of meat and poultry were established in the Humane Slaughter Act of 1958, the Wholesome Meat Act of 1967, the Wholesome Poultry Products Act of 1968, and the Humane Methods of Slaughter Act in 1978. These laws, which placed direction of local humane slaughter and inspection operations under veterinarians, are in force today. They set standards and requirements for commercial slaughter and processing plants operating under either Federal or State inspection.

Public health in the United States changed significantly since the first meat inspection acts. At that time, the leading cause of human illness and death was infectious disease. Today, chronic diseases such as cancer and cardiovascular disease cause more deaths. Microbiological hazards remain a significant risk to human health via the food supply. Chemical and physical hazards must also be effectively controlled and are of particular concern to certain international trading partners. There is also a growing concern and controversy about the use of antimicrobials in animal feed and in treatment of animals and the transfer of antimicrobial resistance by these pathogens in the food supply and the effectiveness of on-farm controls.

From the beginning of the 20th Century, USDA inspectors have relied primarily upon organoleptic examination of products, equipment, and facilities to detect and correct food safety problems and to conduct other consumer protection activities, first in meat plants and later in poultry plants. At the beginning of the century, diseased animals were an important human health risk. Today, most animals are slaughtered in large automated facilities which specialize in younger, healthier, and more uniform animals, with few diseases that constitute foodborne threats to humans. Cull animals generally go to specialized plants where veterinary disposition still plays an important role in preventing pathology and drug residues from entering the human food supply. Today, most meat-related foodborne disease outbreaks trace back to animals or birds free from signs or symptoms of disease. Invisible microbiological hazards are the greatest risks to human health.

Animal health has changed as well. Many infectious animal diseases are now controlled. Animal health improvements have increased animal production. More animals are slaughtered at a younger age. Animals and birds are

produced more efficiently with the help of growth promotants and genetic manipulations. Modern production practices will continuously evolve in order to survive in the world market place.

Studies by the National Academy of Sciences (NAS), the U.S. General Accounting Office (GAO), and FSIS itself have established the need to fundamentally change the FSIS inspection program. The studies have consistently recommended that the Agency reduce its reliance on organoleptic inspection of individual animals for food safety, shift to prevention-oriented process control inspection systems based on risk assessment, and redeploy its resources in a manner that better protects the public from foodborne diseases. Outbreaks of microbial foodborne illness caused by *Salmonella*, *E. coli* O157:H7, *Campylobacter* and *Listeria* and recalls of unsafe meat and poultry over the last several years have reinforced the need for a more effective food safety regulatory system, based upon the best science available.

The Pathogen Reduction; Hazard Analysis and Critical Control Point (HACCP) Systems Final Rule was published July 1996. The new law fundamentally changed the way FSIS approached its mission and required a major cultural shift by all Agency employees. The rule states the FSIS goal:

FSIS believes its food safety goal should be to reduce the risk of foodborne illness associated with the consumption of meat and poultry products to the maximum extent possible by ensuring that appropriate and feasible measures are taken at each step in the food production process where hazards can enter and where procedures and technologies exist or can be developed to prevent the hazard or reduce the likelihood it will occur.

The Agency has targeted a 25% reduction in foodborne illness attributed to meat and poultry by the end of the year 2000. FSIS is redeploying its resources to reduce foodborne illness and to provide regulatory oversight within its statutory authorities along the farm-to-table continuum. For instance, FSIS envisions intensifying its food regulatory activities, within its statutory authorities, to address safety hazards and other consumer protection as product moves out of the plant and is transported, stored, and distributed to consumers.

WHAT VETERINARIANS BRING TO THE FOOD SAFETY TABLE

Veterinarians bring a broad combination of knowledge and skills to the interdisciplinary farm-to-table public health team. To obtain a Doctor of Veterinary Medicine (or Veterinary Medical Doctor) degree in the U. S., they usually complete four years of pre-veterinary and four years of veterinary college education. Their education includes extensive clinical practice in diagnosing

diseases in seven major animal species. Their education includes extensive knowledge of microbiological, chemical and physical health hazards of food animals. Upon graduation, Doctors of Veterinary Medicine have the basic foundation for building advanced public health and preventive medicine skills in risk assessment, management and communication, and in human and animal population epidemiology and statistical evaluation. Many veterinarians also have advanced degrees such as a Master of Public Health, Master of Science, PhD, or Master of Business Administration. They often take post graduate training to qualify for Board Certification in Veterinary Preventive Medicine, Pathology, Microbiology, Toxicology and other specialties. Graduates of foreign veterinary colleges must be a U.S. citizen, and pass an English proficiency examination and the U.S. National Board for Foreign Graduates to be employed by FSIS.

Doctors of Veterinary Medicine bring critical skills to ensuring the safety of foods of animal origin:

- ◆ Veterinarians are the predominant internationally recognized authority to audit and inspect foreign establishments that export animal foods to the United States. They assess the safety of animal products from foreign sources, including freedom from unsafe levels of chemical residues, exotic pathogens and emerging agents of public health importance. Veterinarians are recognized internationally for possessing the scientific competence and integrity to sign certification for animal products attesting that the products were produced within a system of controls which meet both food safety and disease freedom requirements of importing countries. They help ensure public and international confidence in the safety of the animal-based food supply.
- ◆ Veterinarians have an in-depth understanding of production practices and animal disease and the linkages between them. They can identify and scientifically evaluate the potential human and/or animal health significance of the wide variety of clinical signs in animals submitted for slaughter (antemortem inspection). These skills help veterinarians make individual animal disposition judgments and target animals that may need more intensive inspection and/or diagnostic work. Examples include: (1) surveillance for exotic or notifiable diseases (e.g. bovine spongiform encephalopathy, brucellosis and tuberculosis); (2) monitoring for disease or physiological states which can increase the potential for, or significance of, contamination occurring during processing (e.g. severely stressed animals tend to be high shedders of *Salmonella*); (3) assessing suitability for entering slaughter of non-ambulatory animals (downer animals), injured animals or animals approaching parturition (about to give birth), and then examining them after slaughter; (4) checking for signs indicating likely recent drug treatment or exposure to contaminants; and (5) monitoring for disease

or physiological states which make the animals unsuitable for slaughter for human consumption (e.g. septicemia, toxemia etc); humane slaughter oversight. While other specialists may be able to evaluate animals as "normal" or "not normal," a veterinarian should make a specific diagnosis and interpret the significance of the findings. This information is increasingly important in ensuring reliability of producer and processor quality assurance programs in the farm-to-table continuum.

- ◆ Veterinarians have knowledge and experience in pathology, microbiology and toxicology to evaluate human health hazards during the slaughtering process (at postmortem). They are able to evaluate and correlate risks that may impact food all the way to the consumer. Suspicion or diagnosis of exotic disease is reported to Animal and Plant Health Inspection Service (APHIS) veterinarians immediately to facilitate traceback and prevent local or national disease spread. Doctors of Veterinary Medicine are trained to assess lesions, microbiological and chemical residue findings and other laboratory data to advise animal and human health authorities and industry on prevention, decontamination and/or product recalls. Veterinarians can collect and evaluate specimens for specific hazard identification and for monitoring for chemical residues, infectious diseases, emerging pathogens, and zoonotic parasites.
- ◆ The scientific training and diagnostic skills of veterinarians make them particularly well equipped to identify and solve problems. They understand those factors which contribute to food safety from farm to table. This enables them to assess and verify HACCP plans and systems at production, processing, and retail levels. Their perspectives and evaluative skills extend well beyond applying the FSIS regulations. They are well trained to perform oversight and verification, assess performance standards of FSIS food inspection and microbiological laboratory personnel, and verify industry quality and safety controls throughout the food chain.
- ◆ Veterinarians have a strong foundation upon which they can build capabilities to supervise, train, and interact with others. This includes knowledge and professional experiences in record keeping, systems analysis, administrative skills, and client education. Veterinarians have skills in developing, implementing and analyzing public and animal health policies, correlating and analyzing information systems, managing and leading complex and extensive government programs and personnel, and building national and international partnerships for food safety systems. Veterinarians can train food inspectors, laboratory personnel, and sanitarians. These skills will be especially important in helping educate very small plant operators to meet pathogen reduction and HACCP requirements.

- ◆ Veterinarians are well-trained and experienced in animal welfare during production and in humane handling as animals are transported, unloaded, stunned and handled at plants. They are well able to evaluate compliance with the Humane Slaughter Act, especially proper stunning, bleeding, rail insensibility, pen maintenance and handling, truck unloading procedures and handling of non-ambulatory animals.

Outside of FSIS, veterinarians provide leadership to human and animal health programs in other Federal and State agencies and promote public health and the safety of animals presented for slaughter. They help prevent animal disease, protect against exotic diseases, certify animal health, and control animal drug and agricultural chemical use.

- ◆ Veterinarians in food animal practices are first line promoters of the production of animals that are healthy, free of violative residues and other public health hazards. They prevent, control, and eradicate animal diseases. Skilled in examining animals for specific public health hazards, they form important links to FSIS veterinarians by validating and maintaining food safety and quality assurance certification programs and auditing systems.

ISSUES

I. DEFINING THE ROLE OF THE FSIS VETERINARIAN

Issue Statement:

FSIS must define the roles of FSIS veterinarians to meet the challenges of HACCP implementation within the farm-to-table continuum and to fulfill their functions as FSIS public health officials.

Discussion:

The 1996 Pathogen Reduction/HACCP rule fundamentally changed FSIS's approach to its food safety mission. The historic role of FSIS veterinarians in plants was to prescriptively regulate processes and procedures to ensure product safety and quality. The Rule clarifies industry's responsibility to ensure food safety. Under HACCP, the FSIS role is to verify in-plant compliance with regulatory performance standards. For example, if a plant proposes a unique method to meet the performance standard for reducing *Salmonella* in cooked beef, the veterinarian could verify that the method will allow the product to meet the performance standard. This might include evaluating scientific literature,

monitoring processing controls and examining in-plant data, and independent laboratory verification of end product compliance.

This change from prescriptive oversight to a more flexible HACCP system requires broad-based scientific knowledge, critical thinking, and the authority to make professional judgments at the lowest level. HACCP requires science-based decisions which impact across a wide range of entities. With performance standards in place, veterinarians will better utilize their knowledge, skills, and abilities to evaluate control efforts within the HACCP system contributing to improved food safety. However, several issues need to be addressed before new roles for the FSIS veterinarian can be fully implemented.

Specifically, the effectiveness of HACCP implementation is limited by lack of experience and expertise and resistance to change at all levels of FSIS. Lack of teamwork, mixed messages and unwise decisions discourage industry cooperation and destroy employee morale. Effective representatives of the veterinary profession, microbiology, food science, compliance and processing should work together to design effective HACCP oversight which encourages innovation and progress. FSIS needs a more diversified HACCP implementation team at all levels. The Agency is requiring HACCP implementation in three stages, depending on plant size. This challenges veterinarians to demonstrate their qualifications as public health program managers. During the transition to HACCP, they must manage traditional inspection and lead the change into the new science-based system. Such a major change is difficult. Technical training is being provided to veterinarians and inspectors, but they will gain confidence only through experience and additional training on oversight and verification. Changes in the interpretation of some regulatory provisions after the training and the complexity of enforcement procedures add to the complexity for inspectors. Veterinarians as public health program managers must commit to study and understand HACCP and lead the workforce to fully understand all its provisions.

In addition to the concerns noted above, there are other issues to be addressed before the veterinarian role can be expanded to fully utilize their skills within the HACCP environment. The historic role of FSIS in-plant veterinarians has been limited to detecting lesions; testing and sampling for chemical, drug, and pesticide residues; supervising food inspectors; and performing other procedural duties dictated by regulations, directives, and managerial requirements. In many plants these duties consume the entire day and prevent FSIS veterinarians from assisting in evaluating food safety and verifying HACCP plan verification. Examples of such duties include:

- Providing line breaks for bargaining unit employees
- Performing residue “quick tests”
- Preparing and sending samples to laboratories

- Staffing and scheduling of line personnel
- Administrative supervision of inspectors (Recommend delegation of first-line supervision)
- Facilitating labor and management relations (e.g., grievances and appeals, EEO actions)
- Resolving employee and industry disputes

Therefore, FSIS needs to redefine the responsibilities of veterinarians to ensure adequate time for food safety activities for HACCP implementation. Effective HACCP oversight requires flexibility, informed judgments, and continuous learning within a science-based inspection program. This refinement of roles may require effectively delegating day-to-day in-plant line inspection and administrative and staffing duties to senior inspection personnel. Technical and administrative responsibility should remain with the veterinarian in charge.

In addition, FSIS needs to define, clarify, and expand the in-plant veterinarians' role as a systems manager with the overall responsibility for assessing data on incoming materials and in-plant activities. This would include performing trend analyses for meeting food safety performance standards. This expanded role will require overseeing the entire process within plants to verify HACCP compliance and to assess risks. Using multiple data sources and visual observations, veterinarians will make professional judgments about the adequacy of HACCP systems. This includes evaluating data and observations on live animals and processing materials. For example, veterinarians can compare on-farm certifications with their medical evaluations of animals presented for slaughter and with other live-animal information.

Establishments can use the data on identifiable risks to modify their HACCP plans for continuous process improvement. For example, livestock production practices which reduce food safety risks at slaughter could enable plants to modify HACCP plans and may support Agency revision of a science-based standard. Such modifications will require oversight from a broad-based professional who can assess the potential changes and public health impacts of such changes. These activities require collation of a wide range of information resources both within and external to the Agency. Such activities will require timely interactions between field (in-plant, circuit and district) veterinarians and other Agency programs (e.g., Technical Services Center, Office of Public Health and Science, and the Office of Policy Program Development and Evaluation). In addition, the field veterinarians will interact with industry personnel, State and private veterinarians, animal producers, academia, consumer groups, and other governmental entities.

Successful farm-to-table HACCP implementation also requires that all groups within the food production system work cooperatively to define and maintain food quality systems and safety objectives. Exchange of timely data is essential to

process and product evaluations and the resulting food safety decisions. Evaluating information is part of the process for ensuring accountability for food safety.

To successfully achieve these cooperative relationships, FSIS should expand the field/in-plant veterinarians' role for these food safety activities as facilitators, creators, and/or managers of teams and partnerships to address industry and consumer needs from farm to table. FSIS veterinarians are well placed to team with local authorities, producers and other partners to facilitate discussions and evaluations of alternative processes and technology. This team interaction may require inputs, agreements and information exchange by in-plant personnel, other State and Federal agencies, suppliers and other partners.

Inspection oversight should also be tailored to meet the diverse nature of the meat industry and be based on an assessment of public health risk. Premium high quality plants that have effective HACCP systems, and produce massive quantities of uniform product tailored to meet customer demands for consistent quality, need fewer inspection personnel to protect the public's health. Conversely, meat production facilities still exist that have not modified their methodologies or facilities significantly in the last 40 years. Some of these plants improve only when threatened or are penalized. Many plants possess less effective quality programs where production and economic concerns may cause them to take risks which could affect public health. Sufficient FSIS staffing must remain present to encourage and assure industry adherence to food safety principles.

Some plants specialize in slaughtering animals not utilized by the premium animal facilities. They slaughter spent layers, dairy cattle, inefficient breeding stock, and injured, diseased and downer animals. Stringent sanitation and effective process controls are needed to produce safe food. Since these facilities slaughter animals with a greater percentage of disease and pathologic conditions, as well as a greater likelihood of drug residue violations, veterinarians must provide more intense oversight and scrutiny to ensure food safety. However, despite these challenges, FSIS staffing of these facilities is still based on numbers of animals slaughtered, rather than on their potential as risks to human health. FSIS needs to improve food safety oversight of cull slaughter operations by reassessing and maintaining an appropriate level of veterinary staffing in these operations. In conjunction with increased staffing, it is also suggested that the Agency provide promotions and other incentives to encourage, motivate and retain an effective veterinary workforce at these more challenging facilities. Greater utilization of such facilities for education and training would be of considerable benefit to the Agency as well.

Cull animal slaughter facilities also provide a great source of animal health/disease information that could help improve herd and flock health and

ultimately food safety. These are also the facilities where antibiotic and chemical residues and humane issues are most probable. These facilities should monitor their animal suppliers. Food safety oversight would be greatly improved by positive animal identification requirements to facilitate effective traceback for residue or animal health issues. The veterinarian could play a key role in compiling and analyzing data from these facilities, and work in partnership with industry, State veterinarians and APHIS to enhance food safety and animal health.

Lastly, as the Agency reassesses the veterinarian's role in the plant, the consideration should be given to a more integrated approach to policy development and implementation. Currently the Agency does not fully utilize field (Districts and Technical Service Center) expertise in developing policies and action plans. With its more science-based inspection program, FSIS can also benefit from veterinarians' expertise by ensuring they are key players in the development and evaluation of public health policy. It will be important to utilize employees from all disciplines, located at various organizational levels both vertically and horizontally, and from headquarters and the field to ensure successful implementation of new programs.

Recommendations:

1. Reassess the responsibilities of FSIS veterinarians to ensure their role in food safety takes precedence over all others.
2. Utilize more of the skills of veterinarians to oversee the implementation and interaction of system controls, rather than just verify their application, to ensure better critique of the appropriateness and adequacy of these systems.
3. Provide clarified authority for FSIS veterinarians that ensures food safety performance standards compliance from farm to table. Such activities will require making informed judgments to prioritize inspection actions to verify control processes within the HACCP systems.
4. Define the in-plant veterinarian's role as the only government official who is responsible and technically accountable for assessing and making a scientific judgment, as a result of analysis of available data, whether the plant is operating under a sufficient and appropriate food safety control and monitoring system.
5. Encourage in-plant veterinarians to regularly interact with other relevant health professionals (animal and human), producer groups, and others in the supply chain (animal auctions, dealers) in the surrounding area to foster

better lines of communication and understanding of how each group can better ensure the farm-to-table food safety assurance concept is better actualized.

6. Enhance the systems oversight role for FSIS veterinarians utilizing all the available information and documentation within a risk-based (HACCP) system.
7. Enable FSIS veterinarians as educators, facilitators and/or managers of teams and partnerships to address researchers, industry and consumer groups in food safety needs from farm to table.
8. Provide opportunities for FSIS veterinarians to educate industry and the public. FSIS veterinarians should help develop educational materials and be allowed official time and compensation for this function.
9. Recognize the international role for FSIS veterinarians as technical liaison with other countries and international organizations.
10. Appoint an FSIS Chief Veterinary Public Health Officer to coordinate domestic and international technical issues related to food animal and public health and oversee veterinary personnel credentials, education, training and support.
11. Maintain liaison with the Chief Veterinary Medical Officer of the USA (Currently resides in APHIS). That position would coordinate domestic and international technical issues related to food animal and public health.
12. Create department level Chief Veterinary Officer for the United States as advisor to the president via the Secretary of Agriculture to coordinate international animal health plus meat and poultry food safety control issues.
13. Provide leadership for food safety initiatives to meet established domestic and international standards. Veterinarians are qualified by a broad biological education and experience to deal in a wide range of areas important to food safety, including, but not limited to:
 - Disease recognition, especially zoonotic diseases
 - Emerging pathogens
 - Bioterrorism threats
 - Foreign animal disease threats
 - Public health
 - Epidemiology
 - Science-based certification and auditing processes
 - Animal science and population medicine experience
 - Pathology

- Parasitology
- Microbiology, virology, bacteriology
- Comparative medicine and multi-species experience chemistry/toxicology and pharmacology.
- Drug resistance mechanisms

14. In plants which slaughter cull animals, FSIS should:

- Reassess staffing of personnel to ensure protection of the public health.
- Upgrade veterinary positions to attract and keep the appropriate level of veterinary expertise.
- Encourage the utilization of diagnostic information in partnership with FSIS epidemiologists, industry, State veterinarians and APHIS.
- Utilize such facilities for education and training programs trainee and refresher courses.

II. EDUCATION, TRAINING, RECOGNITION AND RECRUITMENT

Issue Statement:

FSIS must clarify, expand and promote career tracks and educational opportunities for veterinary public health professionals. The Agency needs to change how it recruits, develops, recognizes and retains highly qualified veterinarians.

Discussion:

As FSIS employees assume a new role in a farm-to-table food safety and HACCP environment, the Agency must assess how to fully develop and utilize FSIS veterinarians. This issue is multi-faceted. It requires examining veterinarians' skills and education, how to continually develop and utilize their skills, and how to recruit and retain highly qualified, motivated veterinarians to meet public health challenges in the 21st century.

The current Pathogen Reduction/HACCP environment requires greater professional judgment and expertise to make broad science-based decisions. The need for individuals educated in the traditional areas of pathology, microbiology, epidemiology, toxicology, public health sciences, and production medicine will increase. Other important areas include business management, risk assessment and management, manufacturing engineering, food science, international studies, environmental sciences, and leadership, management and administrative skills. Veterinarians' education, training, and experience closely mirror many of these specialties.

FSIS veterinarians should take more advantage of their expertise and training to apply for positions as program managers, policy analysts, compliance officers, HACCP experts, and scientific staff and leadership opportunities. For example, because of their broad-based education of analyzing health systems, veterinarians can integrate information from farm through table. Specifically, in-plant veterinarians can correlate slaughter data, and evaluate on-farm pathogen reduction efforts to confirm the effectiveness of on-farm quality assurance programs for animal producers. Veterinarians can also work with public health authorities to better identify sources and causes of public health concerns, and then correct or prevent them. Furthermore, the Agency can tap into the veterinarian's analytical and problem solving skills in order to perform broad public health policy development and evaluation, risk assessment, data management and evaluation, leadership and administrative activities which have both national and international impact. These activities offer only a sampling of the type of work that can be performed by a veterinarian. For example, in many agencies, such as State health departments, veterinarians serve as administrators, environmental health officers, and epidemiologists.

To take advantage of the diverse experience described above, FSIS needs to first examine how it has been utilizing veterinarians to date. Historically, veterinary recruitment and careers in FSIS have focused primarily on in-plant positions with most of the emphasis placed on the responsibility for detecting lesions and violative residues in animals presented for slaughter and supervising line inspectors. Veterinarians usually remain in this career track until advancing to higher-graded supervisory positions. Traditionally the Agency has filled in-plant positions with outside candidates and filled higher-level veterinary management positions from the ranks of field veterinarians. In-plant jobs are the usual entry-level positions and, subsequently, most FSIS veterinarians have followed this career track regardless of their expertise or interest.

While FSIS field experience is critical, veterinarians qualify and should compete for many other positions that do not require a veterinary medical degree and are outside the plant. Many veterinarians may perceive that they can only compete for positions classified in the Veterinary Medical Officer (VMO) series, GS-701—the numerical occupational designation used for veterinary positions in the Federal Government. FSIS needs to educate its workforce, including veterinarians and selecting officials, that veterinarians may qualify for many other positions and do not lose credentials by accepting such positions. Management needs to embrace and endorse this philosophy.

In conjunction with utilizing veterinarians in a wider range of positions, the Agency can take better advantage of the skills offered by its current workforce. Throughout the Agency, many employees have advanced degrees, Board Certification, and knowledge and skills that are unrecognized and underutilized

in their current positions. For example, veterinarians currently in the Agency hold graduate degrees in molecular biology, pathology, microbiology, toxicology, business administration, etc. Many are multi-lingual and could assist the Agency in activities such as reading labels, communicating with a migrant workforce, and making presentations. In these times of tight budgets and limited resources, veterinarians' varied background can allow the Agency to cross-utilize its current workforce to meet changing priorities and new opportunities in food safety.

FSIS can enhance food safety oversight by continuously investing in educating and training all employees, including veterinarians. To effectively move into the 21st century public health arena, FSIS needs to maintain, update, refine and expand its employees' skills. In the past, the Agency offered advanced training programs in science and technology, such as genetic engineering, but did not support continuing education and development in those fields. The Agency must develop and utilize training programs in HACCP, statistical process control, problem solving, risk assessment, molecular epidemiology, food science, epidemiology and other bioscience specialties to maintain basic expertise. The Agency could increase the number of employees participating in the Supervisory Educational Program, HACCP Expert Training, employee development programs, continuing education and seminars, graduate education, Board Certification, international exchanges, sabbatical leaves, inter-agency liaison programs and fellowships, and industrial/corporate externships.

The Agency should support, and veterinarians should seek opportunities such as the Senior Executive Service Candidate Development Program and other fellowships and exchange programs for leadership, management and administrative skills. Veterinarians should seek mentors external and internal to FSIS to introduce them to new perspectives and career paths in the administrative areas. FSIS needs strong, effective leadership. A leadership development program will enhance managerial skills at all levels. Veterinary leadership will add scientific knowledge and credibility to the management team. Veterinarians have a strong foundation for transitioning into an administrative management and leadership career path.

It may also be helpful to look at professional development programs in other agencies. For example, CDC, APHIS, and the Department of Defense (DOD) have enhanced their effectiveness by establishing professional development programs which include preventive medicine, public health, epidemiology, microbiology, food science, leadership, management and administrative skills. This expanded expertise will broaden the perspective of FSIS veterinarians and ensure that the Agency stays abreast of new developments in public health and science.

In conjunction with ongoing professional development and training, employee recognition is also critical to motivating and retaining a highly qualified

professional workforce. Agency management needs to encourage supervisors to publicly recognize employee achievements and outstanding performance. In addition to broader use of existing recognition systems, such as awards of cash or time off, supervisors should be encouraged to use non-monetary awards such as plaques, letters, and newsletter articles. By fully utilizing, developing and recognizing the existing and developing cadre of veterinarians, FSIS will be able to attract, recruit and retain new employees in the future. In addition, it will be important for prospective applicants to possess the skills the Agency needs to carry out its priority food safety mission goals.

By fully utilizing, developing and recognizing the existing cadre of veterinarians, FSIS will be in a better position to attract, recruit and retain new employees in the future. In addition, prospective applicants will need to possess the skills that the Agency needs to carry out its food safety mission. Presently, FSIS is the leading employer of veterinarians in the nation and actively recruits graduates from colleges of veterinary medicine. However, the current veterinary college curriculum focuses primarily on large and small animal clinical practice. To provide effective food safety oversight in the 21st century, FSIS leadership and veterinarians could participate as adjunct faculty to encourage career paths and curricula in public health. FSIS could also create joint, mutually-beneficial programs, such as programs leading to a special degree or certification in areas such as risk assessment.

To promote food safety as a viable career option for veterinary graduates, FSIS and veterinary students may participate in the Virginia-Maryland Regional College of Veterinary Medicine's Center for Government and Corporate Veterinary Medicine and other special academic programs focused on veterinary career opportunities other than clinical practice. FSIS should closely partner with the Center and other veterinary colleges to provide practical, rewarding, hands-on experience in food safety and public health settings. Linkages with the Center could be enhanced through cooperative agreements and memoranda of understanding for clerkships and graduate opportunities. Partnering with the Center's executive fellowships in leadership and policy could expand FSIS's network of future veterinary leaders.

In summary, how the Agency develops, uses, and recognizes the skills and talents of the current FSIS veterinary workforce, and how the Agency can best prepare and recruit public health professionals in the future will be key to enhancing the effectiveness of FSIS in the next century. The recommendations outlined here will be key to recruiting and retaining highly qualified and motivated veterinarians to accomplish the Agency's program goals and objectives.

Recommendations:

1. Develop a robust education and training program in both traditional and non-traditional specialties to maximize the value of employees, including veterinarians.
2. Identify and communicate career tracks which may not be readily understood by veterinary medical colleges, new recruits, and the current FSIS veterinary workforce. A Career Planning Guide for Veterinarians and a strong mentoring program could accomplish this. The career tracks could be:
 - Public Health Policy and Assessment Track: The Agency could use veterinary analytical and problem solving skills for risk assessment, data management, epidemiology, research, and policy development and evaluation. This track could also encourage FSIS veterinarians to interact with others in academia, States, and other organizations.
 - Inspection Application Track: In addition to traditional roles in antemortem and postmortem inspection, FSIS veterinarians could monitor animal health and product safety from farm to table. They could monitor feed testing results, drug therapy and withdrawals; verify HACCP systems; and conduct enforcement and compliance activities.
 - Administration/Management Track: Veterinarians and the Agency should seek opportunities to develop and mentor future leaders in administration and management.
 - International Track: FSIS veterinarians could contribute to international communications (using foreign language skills), policies, exports and imports involving foods of animal origin.
3. Provide information on job qualification requirements and how they are used in evaluating applicants. Use vacancy announcements and other information vehicles to provide guidance on how applicants may qualify for other job series and still remain competitive for higher-graded GS-701 positions.
4. Conduct a needs assessment to determine the kinds of professional knowledge and skills the Agency needs now and in the foreseeable future to accomplish its public health mission.
5. Conduct an FSIS employee skills survey to identify the professional knowledge and skills Agency employees already possess and better utilize them in accomplishing the Agency's public health mission.
6. Establish and maintain a talent resource database that captures employee

advanced education, board certification, language skills, and other specialized knowledge and skills to enhance job enrichment and advancement and allow the Agency to more efficiently tap these valuable resources.

7. Reserve a budget for 10% of the workforce to be in employee development, training, education, or team building at any given time. Maintain an encumbered educational fund dedicated to enhancing traditional and non-traditional skills and knowledge activities to ensure availability of needed proficiencies within the Agency. These skills should include leadership and staff skills necessary in developing and implementing public health policy, risk analysis and food safety initiatives, with both domestic and international focus.
8. Encourage networking and mentoring to assimilate new employees and support new and existing FSIS veterinarians.
9. Improve recruitment efforts to undergraduate and professional levels, with incentives to attract highly motivated and qualified veterinarians to FSIS and encourage them to become broadly trained public health scientists. Expand recruitment efforts to include potential applicants from the private sector and State and local governments to introduce new ideas and enrich Agency programs.
10. Create a Veterinary Recruitment Officer(s) Program. Establish the criteria and select Veterinary Recruiters to build a better presentation package. Promote and use veterinary internships for new veterinary graduates interested in a food safety career, and veterinary externships for veterinary students interested in a food safety career.
11. Establish a dedicated full-time position to work with universities to encourage curriculum development and to present food safety as a career alternative to students, faculty and public health professionals. FSIS should:
 - Identify veterinarians who have skills to instruct food safety classes and promote careers in FSIS.
 - Develop a course on HACCP and food safety, at the Technical Services Center, to be offered in the colleges of veterinary medicine.
 - Develop FSIS recruitment presentation.
 - Promote and implement advisory programs at veterinary colleges.
 - Promote continuing education and graduate study (with continuing service agreements) and place individuals in positions which use the training.
 - Encourage combined degrees, such as Doctor of Veterinary Medicine with a Masters of Public Health or Masters in Business Administration.

- Encourage achieving qualifications for Board Certification.
 - Make food safety presentations to veterinary students.
 - Promote and use veterinary internships for new veterinary graduates interested in a food safety career.
12. Promote and use veterinary internships for new veterinary graduates interested in a food safety career.
 13. Establish a competitive training option for two-year assignments with the Epidemic Intelligence Service at the Centers for Disease Control and Prevention (CDC) and other preventive medicine programs. Consider developing a "commissioned corps" within USDA or using Public Health Service Veterinarians.
 14. Publicly recognize achievement and reward excellence in service.
 15. Develop a program for veterinarians and other specialists to obtain and retain technical expertise which enhances the effectiveness of the food safety oversight system.
 16. Expand FSIS partnering with Colleges of Veterinary Medicine and Centers of Excellence (e.g., Center for Government and Corporate Veterinary Medicine) to develop FSIS adjunct faculty opportunities, veterinary student clerkships, externships, fellowships, graduate programs, etc., in public health, food safety, leadership, and administrative career path development.

III. PARTNERSHIPS

Issue Statement:

Partnering with diverse farm-to-table stakeholders is necessary to achieve the common goal of a safe, wholesome and affordable food supply. National, State and local government agencies need to interact to expand food safety activities and services from farm to table. Veterinarians can contribute important skills in these partnerships.

Discussion:

The President's Food Safety Initiative of 1997 instructed key Federal food safety agencies to cooperate to improve the safety of the nation's food supply. Currently, at least 12 Federal agencies have significant food safety responsibilities, including USDA (FSIS; Cooperative State Research, Education

and Extension Service; Agricultural Research Service; Economic Research Service; and the Office of Risk Assessment and Cost Benefit Analysis), Health and Human Services (Food and Drug Administration; National Institutes of Health; and the Centers for Disease Control & Prevention), Environmental Protection Agency; Commerce; and the Department of Defense. A 1997 report to the President outlined research and educational priorities and a need for further coordination. The President created the Council on Food Safety, co-chaired by the Secretary of Health and Human Services, the Secretary of Agriculture, and the Director of the White House Office of Science and Technology Policy. The Council is developing a food safety strategic plan with coordinated budget requests.

State and local agriculture and health agencies provide significant food safety services from farm to table. For years, governmental agencies have cooperated, with a delineation of responsibilities. Because partnering encourages the sharing of technical and budgetary resources, the development of common interests and goals and the opportunity to share information and work together, partnerships will be significantly expanded in the future. The broader functions will include a more seamless, coordinated food safety system beginning at animal production, extending through transport, holding facilities, slaughter and processing, distribution and wholesaling, to final food preparation and consumption. One of the most important outcomes of successful partnerships is improved educational outreach efforts to small business producers and processors and consumers. Veterinarians can play expanded roles in enhancing cooperative education among national, State and local governments and the food industry and the public.

Many examples of partnerships, both long-standing and recent, can be cited among all levels of government. Veterinarians participate in many of the teams and will increasingly be members and leaders in these partnerships. FSIS is championing partnerships at many levels. In 1997, it committed \$1 million and since has committed additional technical and financial resources to partnerships to develop food safety and HACCP programs for small and very small plants. FSIS veterinary field officers and epidemiologists are well positioned to interact in traditional Federal/State relations and to be catalysts for new partnerships.

FSIS is also a key player in the Partnership for Food Safety Education involving partners in and beyond government. Ednet, a partnership among FSIS, FDA, and CSREES delivers food safety data and information via the Internet. Veterinarians are welcome partners in food safety education. FSIS is partnering with CDC, FDA, and eight states in the federally-sponsored FoodNet, an active foodborne disease surveillance network which collects, analyzes and provides data on Salmonellosis and other human illnesses. These data are valuable in assessing the effectiveness of HACCP implementation; the first annual HACCP analysis shows a decline in the prevalence of *Salmonella* on meat and poultry

and FoodNet identified a corresponding decline in human foodborne illnesses. More comprehensive sampling at slaughter and correlation with on-farm data collected in the APHIS National Animal Health Monitoring System (NAHMS) would provide more seamless data from farm to table. Veterinarians can be extremely valuable to these partnerships by developing effective protocols, collecting samples, assessing data and reporting progress.

FSIS veterinarians are also very important in developing the Animal Production Food Safety Partnerships between FSIS and, currently, 18 State pilot projects. Veterinarians work together locally to address key food safety and animal health issues. Veterinarians may be major participants in the Outbreak and Recall Response Coordination Groups being organized to coordinate responses to foodborne outbreaks. For example, both Washington and Georgia hold quarterly interagency meetings to coordinate responses to food, water and other public health emergencies. A formal animal health/public health partnership between the California Department of Health and the State Veterinarian recently demonstrated its effectiveness in tracing back and controlling an egg-associated disease outbreak.

In addition to the State pilot projects, FSIS partnerships with colleges of veterinary medicine may be very important in maintaining animal production food safety. FSIS has important partnerships with Texas A&M University in education and training, and with Tuskegee University in risk assessment. Locally, FSIS district offices are developing partnerships with the University of Arkansas and North Carolina State University to proactively solve food safety and HACCP implementation problems. Veterinarians and food scientists at Iowa State University and the University of Arkansas are participating in the FSIS Models Project. The future may hold more partnering with universities, especially land grant universities and schools of public health, in education and training.

Veterinarians at FSIS headquarters, veterinary field epidemiologists at District Offices, and veterinarians at the Technical Services Center and the National Training Center play active roles with information leaders and multipliers in government and academe, by sharing epidemiological data from live-animal, in-plant and post-processing pathogen and residue recognition and testing. This role can expand significantly in the future. FSIS, ARS, ERS, FDA, and APHIS have long partnered with academe in research and development, training, and recruiting veterinarians and other scientists. Land grant universities and extension services actively work with FSIS to provide HACCP training and development for small and very small plants. In the future, partnering may include joint studies with FSIS in-plant veterinarians. Effective oversight will contribute to a mutually beneficial and productive learning experience.

Commodity groups and the food industry are key partners in producing safe food. FSIS veterinarians will play important roles in auditing and verifying

animal health and treatment records for certified and branded meat and poultry products produced under partnerships involving producers (such as the National Pork Producers' Council), practicing veterinarians, and processors. These partnerships will include residue avoidance in production (NPPC Pork Quality Assurance Program, Level 3), joint partnerships with USDA (NPPC Trichina Safe Certification), and other HACCP compatible farm-to-table food safety assurance systems.

Recommendations:

1. Develop Cooperative Agreements and Memoranda of Understanding with other Federal food safety agencies, including specific activities and resource provisions for advancing public health goals. Veterinarians may be important members and leaders in these partnerships.
2. Identify and staff official veterinary liaison positions in FSIS partnerships with other Federal agencies, State food safety programs for animal production and State food inspection programs. Encourage participation of FSIS field veterinarians and District Office veterinary epidemiologists in Federal/State partnerships with identified liaison positions and in animal production level partnerships. Job descriptions for FSIS Office of Public Health and Science field epidemiologists should include these duties as a critical performance element.
3. Expand participation of FSIS field veterinarians in pathology, microbiology and residue specimen collection, analysis and reporting (e.g., in partnership with the Center for Veterinary Medicine, FDA, which assess drug safety and withdrawal times).
4. Detail or provide administrative leave to FSIS veterinarians to partner with academic institutions in research and development projects, workshops, and educational programs.
5. Partner with academic institutions in national and district conferences to scientifically assess proposals and solve problems. FSIS veterinarians may partner with veterinarians in academe at all levels of such development.
6. Encourage FSIS Veterinarians to work with commodity groups, State and local governments, industry, and the public to provide education on HACCP and HACCP-compatible programs, especially for animal producers, and for food safety certification programs.
7. Utilize FSIS veterinarians as professionally-skilled members of international

partnerships involving import and export of foods of animal origin.

IV. COORDINATED DATABASES AND ANIMAL IDENTIFICATION

An important charge to the Task Force was to identify potential uses of technology. Databases and positive animal identification are fundamental tools for a food safety system today and in the future.

Issue Statement:

Current gaps exist in food safety information which limit the entire public and private food safety mission. There are information voids in public and animal health monitoring and surveillance. Issues of scarce resources, confidentiality, jurisdiction, and expensive technologies have promoted these data gaps. Public and private interests must construct and maintain coordinated databases to provide food safety at all levels.

Discussion:

The Task Force members believe that they have a responsibility to highlight the absolute necessity of maintaining coordinated databases that serve all food safety and public health professionals, including veterinarians to execute their mission. A nationally-coordinated database containing animal health and food safety data would support science-based decision-making and assist both public and private interests in safe food. Producers and processors would have access to information empowering them to produce safer foods. Government regulatory agencies would be able to monitor epidemiological public health and animal health trends. Academia would have a phenomenal information source to direct research and put food safety research on the leading edge of discovery.

Without the basic tools to monitor, track, and ultimately evaluate the safety of the Nation's food supply the best trained workforce in the world will be limited. Currently, segments of such a database are widely dispersed and often not readily available. Information gaps exist in the current farm-to-table information systems. This situation needs immediate attention since emerging pathogens are frequently zoonotic. Specifically, information is lacking on the pathogens associated with food animals and on the prevalence of chemical and physical hazards. Methods and critical control points for reducing or eliminating pathogens in different parts of the food system are insufficient. There is not enough correlation between key players in the food system and as a result, there are few feedback systems for continuous evaluation and improvement. This lack of information impedes new efforts and the measurement of progress.

One of the most apparent gaps is the lack of a slaughter-based data system combining diagnostic microbiology, antimicrobial resistance, residue analysis,

serology and pathology which would provide an early warning surveillance system to detect emerging animal and human pathogens, exotic/foreign animal diseases, and bioterrorism. Slaughter facilities are a concentrating point for monitoring food animal diseases and detecting emerging pathogens. Therefore, a reliable, coordinated data system that includes data from farm through plant is needed. It would correlate plant data with on-farm quality assurance information and could be linked to human health outcomes. For example, there was a parallel decline in human salmonellosis identified by FoodNet and in the *Salmonella* recovered from foods of animal origin in the HACCP program.

In addition, coordinated databases would also allow evaluation of on-farm quality assurance programs. Public and private entities could contribute segments to such a coordinated database with appropriate assurances of confidentiality. Its success would depend on voluntary buy-in from producer and industry groups. It would generate more rapid and efficient response to animal and public health issues.

Data collection and coordination is also essential for risk assessment, risk management and risk communication. Effective and adequate monitoring and surveillance to identify risks are necessary to improve the allocation of resources and to develop the knowledge needed to manage the hazards that pose the greatest risk. As epidemiology and risk analysis become recognized as critical to public health and food safety, demands will increase for accurate, timely information to control infectious diseases, including foodborne diseases, and to enhance the safety and value of animal-source foods. The design and sampling criteria for this system will require constant input and evaluation by the in-plant veterinarian in collaboration with food safety professionals involved in production and product processing.

The data would guide veterinary epidemiologists in studies to further investigate a particular health hazard. Even with the current limited resources, targeting existing studies to correlate with the APHIS National Animal Health Monitoring System (NAHMS) would enhance understanding and control of pathogens while maximizing the use of existing capabilities. For example, studies of each slaughter class in sentinel slaughter plants would be rotated on a 3- to 5-year basis in parallel with NAHMS studies providing baseline and trend information without exceeding laboratory capacities.

In conjunction with the development of effective coordinated databases, the development of animal identification systems is essential. A national, standardized animal identification program would allow information on pathology, microbiology, residues, etc., to be added to the database at the slaughter facility. Such a database could help verify the effectiveness of domestic and international HACCP systems, facilitating global trade. An animal identification system would enhance a comprehensive surveillance system. It

would also promote coordinated involvement from diverse government agencies. Development of an animal identification system must respect the need for voluntary compliance by the animal production community. FSIS should support APHIS-industry efforts already underway to develop an animal identification system. FSIS in-plant veterinarians are in a unique position to validate the effectiveness of an animal identification system and their involvement is integral to making any animal identification system work.

It will also be important to develop a national integrated surveillance system which would collect information from a variety of sources to feed into the coordinated database. This would entail commitment and extensive funding. Initially, a model multi-state network could be piloted to speed and simplify electronic reporting, analysis and dissemination of data. Again, a major challenge that must be addressed is overcoming fears regarding confidentiality, data ownership, international trade issues, and misuse and misinterpretation of data.

There are many potential users of a coordinated database that correlates animal health data with comprehensive microbiology, pathology, and serological data. Potential partners with FSIS in building a coordinated database include animal producers, APHIS, ARS, CREES, States, diagnostic laboratories, academe and others involved in animal health and food safety research. The database must be transparent for all; however, privacy issues must be addressed, and the overall system be user friendly.

However, because of the diverse number of potential users, the successful creation of the described centralized food safety coordinated database will have obstacles. Several technical and policy issues must be addressed. They include technology standardization, information/computer security, responsibility and control of identification devices, and data capture responsibilities. In addition, ultimately, coordination of effort and funding for developing and maintaining a coordinated database will be at issue.

Another area for discussion concerns the housing of the coordinated database. An excellent comparison for this food safety coordinated database is the National Weather Service. This weather information system is housed within NOAA and functions in partnership with a variety of stakeholders for both input of and use of data. A comparable centralized site for housing the food safety coordinated database might be the National Agricultural Library. Data from the system could be shared with other public health agencies to prioritize food safety activities and for prevention/education efforts. At the National Agricultural Library, the database would be available to the general public and the research community. The important overarching goal would be to use such integrated systems to facilitate the translation of findings from surveillance into improved long-term prevention measures. Collaboration with industry to document and

disseminate successful intervention strategies would be the most important product. Therefore, housing the food safety coordinated database within the library community is logical.

In short, developing and implementing a coordinated food safety database is a principal component of any successful food safety system of the future. It would empower both public and private sectors to improve food safety. A successful coordinated database would:

- Support and enhance voluntary producer quality assurance;
- Verify on-farm practices;
- Enhance food hazard identification and prevention programs;
- Support risk assessment and provide data to prioritize activities;
- Support national animal identification systems linked to information sharing and certification/branded market programs;
- Better utilize FSIS veterinarians for public health/food safety;
- Expand the ability of government at all levels to respond effectively to food safety concerns, including outbreaks;
- Verify international trade requirements.

Recommendations:

1. Determine gaps in existing food safety, public and animal health databases in order to understand and survey the farm-to-table continuum.
2. Integrate existing and yet to be developed segments of the public and animal health surveillance system in order that information is fed into a centralized coordinated food safety database.
3. Cause the integrated surveillance system to provide data on early detection of emerging pathogens and bioterrorism threats, provide evaluation of quality assurance programs, and monitor food safety program progress and effectiveness.
4. Utilize the FSIS veterinary medical workforce as the logical central collection point for data points at slaughter.
5. Establish a working group from key commodity groups, agencies, industry, and academia to update the data systems needs on a yearly basis. The creation of such a working group should be done in an atmosphere of partnership. Furthermore, the working group should be challenged to maintain the transparency of the system while protecting confidentiality issues of participants.

6. Support APHIS in its government-industry partnerships in developing and implementing an animal identification system.
7. A Presidential-level body should address issues of coordination and funding in order to comprehend the need for policy and budget management at the highest level of government. The leadership of the President's Council on Food Safety should be tasked to develop a proposal, with input from academia, to facilitate buy-in, coordination, planning, and funding of a coordinated food safety database.

V. VETERINARY CONTRIBUTIONS TO INTERNATIONAL CREDIBILITY OF FSIS

Issue Statement:

FSIS needs to develop and maintain stronger international relationships with the increasing global movement of food. A cadre of scientific, medical and veterinary expertise is needed to enhance the credibility of U.S. government officials in international negotiations governing food safety and animal health.

Discussion:

Technology, international agreements, and the increasing ease with which information, people and products move have made international trade very complex. The business sector has rapidly changed to accommodate the global nature of economics. The importance of agriculture to most nations and the potential for the spread of disease through the food supply present agencies which regulate food or agricultural products with complex and unique trading challenges. FSIS should make management and cultural shifts to be ready for global marketplace demands. Business will want to explore and capitalize on markets around the world. Consumers will demand new goods and services. Increased importation of food and agricultural products into the U.S. brings the risk of importing animal and public health problems. The U.S. also needs to maintain credibility and confidence in U.S.-produced food, with a system that prevents exporting unwholesome food products. Preserving an international market for U.S. producers and processors depends upon product quality and safety.

Almost all governments require technical assurances that meat and poultry meet their requirements. Foreign markets must respect the credibility and integrity of FSIS export certification. Strong relationships with the controlling authorities of foreign countries can also assure the American public about the safety of

imported foods. Most governments want their consumers to receive the safest food possible and grapple with similar food safety issues. Emerging pathogens, drug resistant bacteria, hormone/antimicrobial utilization, pesticide/antimicrobial residues, as well as new technologies for producing, processing, and marketing food, are global issues. A high level of technical cooperation and communication between governments is vital if these issues, and occasional crises, are to be effectively managed to maintain the highest level of commercial predictability for U.S. import and export businesses.

Recognizing the growing global marketplace is only half the issue. The political desire for fairer international trade is contingent on eliminating trade barriers, quotas and tariffs. Sanitary and phytosanitary issues will be used as international trade barriers. U.S. agencies will need to defend the safety of U.S. products with appropriate oversight and prevent foreign food safety problems from entering the U.S. Therefore, US agencies desiring a global food marketplace need to work with their international colleagues to maintain knowledge of each others' circumstances regarding disease or pathogen claims. Developing relationships, and gathering and sharing phytosanitary and sanitary information are the best defense against excessive standards or misuse of standards as trade barriers.

As a result of the expanding international marketplace and its complicated myriad of issues, the international demands upon FSIS will increase. The Agency needs a sustained awareness of global human health, animal health and food safety systems. It needs strong relationships with similar agencies around the world. All agencies which protect societies from foodborne illness and animal and human diseases need to focus on international risk management. International trading partners rely on veterinarians' expertise and credibility when working with FSIS on food safety issues.

Opinion polls reveal that the veterinary profession enjoys a high level of credibility. Worldwide, customers expect veterinary authentication that animals and animal products meet import requirements. The food animal production industry relies on the veterinary profession's commitment to protect animal health and welfare. The U.S. must meet the requirements of global customers or risk losing market share to competitors. Reliable veterinary authentication of compliance with customer requirements will enhance trust and increase the value of U.S. exports.

Veterinarians are well suited to assess the appropriateness of U.S. standards for other countries and to advise whether different controls may be more appropriate. In addition to using equivalency reviews to assess the safety of imported products, FSIS veterinarians can utilize their expertise in other areas. For instance, they could help establish a national microbiological database to be used as a baseline against which both U.S. processors and exporting

processors could measure themselves. This database could house global foodborne disease information, which could be analyzed by epidemiologists to design “true risk-based” preventive measures. Since many pathogens are zoonotic or have an animal food product as the vehicle, FSIS should assume a greater leadership role in international food safety.

As international markets expand, all countries need to accept the concept of equivalency, not just of individual measures but of whole systems of control. Efforts to promote equivalency facilitate, promote, and maintain cost-effective risk management and honest trade. Countries should ensure that flexibility is written into their laws to harmonize with international standards wherever possible. Codex Alimentarius and the Office of International Epizootics are taking the first steps in harmonization, by developing standards to ensure safety of internationally-traded food products. However, the Sanitary and Phytosanitary Standards Agreement recognizes that individual countries have a sovereign right to determine their own level of protection. The U.S. needs to actively participate in all efforts to better harmonize standards around the world. Therefore, FSIS should consider placing permanent positions as liaisons with the international organizations seeking to harmonize and standardize food safety regulation. Select veterinarians should be encouraged to participate in international food safety and animal health negotiations at all levels. Gifted communicators with established scientific credentials add credence to defensible U.S. negotiations.

In order to effectively participate in these international activities, FSIS needs to develop and maintain an awareness of the epidemiology of global foodborne illness. Currently, a variety of U.S. agencies gather global information on foodborne disease. This information should be integrated and available to identify animal and public issues and trends around the world. FSIS should collaborate more effectively with the national and international animal and public health infrastructure. Such efforts will contribute to risk-based decisions. For example, decisions could recognize a potential emerging public health threat outside the U.S. or the need to defend U.S. products that come under political economic attack from pseudoscientific phytosanitary and sanitary claims.

To facilitate such efforts, FSIS will require a robust infrastructure to support governmental sectors that oversee international trade. Verification and validation will still be needed, even though harmonization and equivalence should minimize oversight. Although the Agency currently maintains this function for approved trading partners, budget and resource constraints restrict its frequency and effectiveness.

Through the establishment of an organizational component with an international focus, the Agency will be able to fully develop a more comprehensive international perspective as well as effectively promote an understanding of what

other countries are doing regarding food safety. The desire and ability to analyze and gain knowledge from other trading partners is wise. In addition, international interaction will promote acceptance of U.S. methods that promote safe food and assist the mission of safe food in a global marketplace.

Recommendations:

1. Develop and fund an FSIS technical unit to describe and justify the U.S. system of controls, stay abreast of international initiatives and/or innovative ideas, gather international food safety data and work cooperatively with the technical agencies of foreign countries.
2. Provide a continual veterinary medical presence in appropriate locations to interact with international organizations on public and animal health issues.
3. Consistently include veterinarians in international negotiations on food products of animal origin.
4. Maintain, validate and audit a reliable and credible export certification process which better meets the expectations of foreign markets.
5. Collaborate with APHIS to validate production industry quality assurance programs.
6. Maintain, validate and audit reliable import controls and ensure veterinary oversight.
7. Encourage select veterinary participation in international food safety and animal health negotiations at all levels. Examples include Codex Alimentarius and Office of International Epizootics.

TASK FORCE MEMBERS – BIOGRAPHIES

[Note – more complete biographical information will be presented in the final report]

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