

United States Animal Health Association – Accomplishments in Service to the Animal Agriculture Industries and the Nation’s Security

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The United States Animal Health Association (USAHA) serves as the nation’s forum for animal health. During the 108 years of its existence, many animal health problems have been addressed and successfully resolved. Established in 1897 to deal with Texas fever (bovine babesiosis), one of the earliest recognized economically important diseases of livestock in the United States, USAHA served as the forum for exchanging scientific information establishing how the disease was transmitted. Consensus was built in the USAHA forum that wide use of acaricides to eliminate the two species of ticks that were the vectors for this disease along with close inspection prior to shipment of cattle should be initiated in order to stop the disease from occurring and to remove interstate movement restrictions that were impeding commerce.

The efforts on Texas fever resulted not only in restoration of less restrictive movement of cattle, but also in the total elimination of this severe, and frequently deadly disease from the United States. Indeed, the experimental work done on this disease provided the clue for the development of control measures for many diseases including malaria, yellow fever, typhus, African sleeping sickness and Rocky Mountain spotted fever. In addition, much of the nation’s agriculture development, especially in the South, can be attributed to the elimination of these tick vectors. The success of building consensus for a workable eradication program despite differences of opinion and motivation proved to be the foundation for how the Association approached disease issues over the course of the 20th century and now, into the 21st century.

USAHA has played a leadership role throughout its existence for a wide variety of animal health and food safety problems. While initial efforts were directed toward the control and elimination of economically important livestock and poultry diseases and the implementation of an inspection system that ensured wholesome meat and poultry products, those subject areas have expanded in the last few decades to include animal disease impacts on public health and at the interface of wildlife and livestock. More recently, the protection of the security of this nation from threats of agro- and bio-terrorism has been added as a focus of USAHA.

Over the past 100 years, a number of economically important diseases have been controlled or eliminated from the nation’s livestock and poultry populations, such as Texas cattle fever, foot- and-mouth disease, hog cholera, screwworms, contagious bovine pleuropneumonia, exotic Newcastle disease, fowl plague (highly pathogenic avian influenza) and pseudorabies in commercial swine. Successful elimination of livestock and poultry diseases and the accomplishments of USAHA are inextricably linked. While USAHA itself does not take sole credit for the control or eradication of these pests, it provided the forum where these diseases could be addressed and solutions reached. One of the biggest success stories most certainly has to be the elimination of screwworm, first from the United States and then from North America.

The two major livestock areas in the United States, the southwest and southeast, were severely impacted by the larvae (maggots) of the screwworm fly. Unlike common blowfly larvae that infest dead and decaying flesh, screwworm maggots are capable of infesting live tissue causing severe illness and, in many cases, death. Even the smallest of wounds, such as a tick bite, can provide a portal for the larvae to invade. Scientists discovered that by releasing sterilized screwworm flies in large numbers, the pest could be reduced and even eliminated. Once use of this technique proved to be successful in the southeastern United States, attention was focused on the much larger land mass in the southwest. Although these efforts led to the complete elimination of the screwworm fly from the U.S. in 1966, a severe outbreak in 1972 demonstrated our continuing vulnerability to re-infestation from our southern neighbor and the need to expand efforts to eliminate screwworms from Mexico. Through cooperative efforts with Mexico, followed by the Central American countries, we successfully pushed the “screwworm barrier” back through Mexico to the Darien Gap between Panama and Columbia where it remains today.

It is estimated that the U.S. livestock industry alone currently enjoys economic benefits of \$750 million a year due to the eradication of screwworm. In addition, eradication of this pest allowed wildlife, especially deer, to greatly increase in numbers in the south and southwest resulting in millions of dollars in new revenue to state wildlife agencies through licensing fees and private businesses that provide services to hunters. The success of this eradication program was made possible by close cooperation between federal and state governments, producer organizations and individual producers, veterinary practitioners, and animal scientists. The USAHA played an important role by bringing these stakeholders together to deliberate and cooperate to develop an eradication program.

Foot-and-mouth disease (FMD) is the most economically devastating disease impacting the livestock industry. While FMD is not a disease with high mortality, it is highly contagious, causes significant loss in production, is costly to eradicate, causes many indirect economic losses, and disrupts important export markets for live animals and animal products. During the 20th century, FMD struck the United States five times-in 1902, 1908, 1914, 1924 and 1929. Direct costs and indirect losses to the Nation are estimated at \$253 million, a considerable amount of money in those days. FMD was a hot topic of discussion at the annual meetings of USAHA during those years. While the United States has been FMD free since 1929, we have been constantly under threat of an accidental introduction. This is true now more than ever with the ease of movement of people and the ever

increasing level of world trade as a result of free trade agreements. Added to that increased threat of accidental introduction is the aspect of intentional introduction by enemies of the United States. USAHA has emphasized foreign animal disease exclusion and emergency preparedness for over a decade and continues to work on enhancement of our ability to protect this nation's animal agriculture. Indeed, USAHA has actively participated on the National Animal Health Emergency Management Steering Committee since its inception and works closely with the U.S. Department of Agriculture and the new Department of Homeland Security on animal agriculture safeguarding issues.

Two success stories in disease eradication of costly swine diseases are the elimination of hog cholera (classical swine fever) and, more recently, pseudorabies. Reports of problems with "cholera" affecting swine date back to the early 1830's. Periodic outbreaks occurred and by the late 1950's, hog cholera was costing producers \$50 million a year. Thus, in 1961, an intensive campaign to eliminate hog cholera was initiated. During the 17 years it took to eradicate this disease, key research on diagnosis and vaccination, and control methods were discussed at the annual meetings of USAHA. In fact, a key symposium on hog cholera held in conjunction with USAHA's 65th annual meeting helped kick off the eradication campaign.

Pseudorabies virus eradication in commercial swine is a more recent example of a successful disease eradication program. Because of widespread, albeit sporadic, incidence of pseudorabies in swine, a new USAHA committee was formed in 1981 to address this economically important disease. Although it was generally thought to be a disease that could be eradicated, lack of initial industry support led the committee to discuss the initiation of pilot eradication projects. Once these projects proved successful and demonstrated that the disease could be eliminated without major economic impact on producers, producers became a full partner in the state-federal-industry eradication program. Remarkable progress was made in ten short years and with the help of newly developed gene-deleted "marker" vaccines, pseudorabies has been virtually eliminated from the domestic swine population. Future challenges being addressed by USAHA include how to eliminate pseudorabies from the feral swine population and reduce the risk of contact with commercial swine that are now free of the disease.

Two zoonotic livestock diseases that are nearing eradication from the United States and that have been a focus of USAHA for many years are brucellosis and tuberculosis. The annual losses to the cattle industry as a result of brucellosis were estimated to be \$25 million in 1961. With the help of a good vaccine introduced in 1941 (Strain 19), the milk ring test introduced in 1952, and controls on the interstate movement of breeding cattle, the prevalence of brucellosis has been reduced to essentially zero in domestic livestock. The last remaining vestige of brucellosis is in wildlife, specifically bison and elk that range in and around Yellowstone and Grand Teton National Parks. In order to eliminate this last focus of *Brucella abortus* and declare the United States free of this disease, USAHA has stepped in to provide a special forum for all stakeholders to address this extremely complex issue using the best available science, and to develop a list of future research needs to provide the tools required to eliminate this disease.

The eradication program for tuberculosis was one of this nation's earliest disease programs. Discussions at USAHA's annual meeting have occurred since the Association was founded. Good progress has been made and the disease is nearing eradication. Like brucellosis, the complete elimination of tuberculosis from the United States has several challenges. Namely, *Mycobacterium bovis*, the causative organism, was discovered in Michigan white-tailed deer a decade ago. While great effort and money has been expended on this problem alone, the incidence of tuberculosis in Michigan deer has not dropped, and they continue to be a risk for exposure of domestic livestock. In addition, due to the high incidence of tuberculosis in cattle in Mexico, imported cattle from that country have provided increased risk for the re-introduction of the disease to areas that had previously been declared free. Through the efforts of USAHA, these two issues have been addressed and strategies formulated to reduce these risks to our cattle population. In 1991, USAHA assisted in the formation of a joint United States/Mexico Committee to address tuberculosis issues on both sides of the border. This Bi-National Committee meets several times annually including in conjunction with the USAHA annual meeting. Efforts of this committee have resulted in a reduced tuberculosis risk in cattle imported from Mexico. More recently, USAHA assembled a special working group of experts to prepare a strategic plan for the final eradication of the disease from the United States.

As has been stated over the years, motivation to eliminate a disease is high when the disease is on a rampage and the losses are obvious. The real challenge in any disease eradication program is to overcome the final or apathetic stage to complete the job when the incidence of disease is low. Through USAHA leadership, stakeholders are being re-energized to pursue the end goal of complete eradication of brucellosis and tuberculosis.

The current United States animal disease diagnosis and surveillance system at the laboratory level is a shared responsibility of publicly funded state animal health laboratories and federal animal health laboratories of the U.S. Department of Agriculture (USDA). The three cornerstones of this critical laboratory "system," or National Animal Health Laboratory Network as it is called, are two USDA laboratory complexes, one located at Ames, Iowa, and the other on Plum Island, New York, and a network of state veterinary diagnostic laboratories.

Recognizing the importance of the nation's animal disease laboratory system to safeguarding our agriculture animal populations, USAHA turned its attention to the USDA laboratory complex located at Ames, Iowa. This complex of laboratories is certainly one of the most critical components of the nation's animal health laboratory system. In view of the fact that the laboratory facilities at Ames, Iowa had reached the end of their functional life and supported by reports of reviews conducted by governmental and non-governmental agencies that

urged the development and maintenance of a state-of-the art national animal health laboratory network, the USAHA made the modernization, upgrading and consolidation of the laboratories located there the number one priority of the Association beginning in 1998. This initiative may have been the single most intensive effort ever made over the course of USAHA's 108-year history.

The Ames, Iowa complex is comprised of USDA laboratories of the Center for Veterinary Biologics, the National Animal Disease Center and the National Veterinary Services Laboratories. These facilities have a multitude of functions including to serve as the national diagnostic reference laboratory; to conduct research on important domestic animal diseases; to license, inspect and test all veterinary biologics that are produced in or imported into the United States; to help in the prevention of the introduction of foreign animal diseases through early identification; to monitor for new and emerging diseases, such as Bovine Spongiform Encephalopathy; to support other animal health laboratories by providing certification, training, reagents and test confirmation; to develop vaccines and diagnostics to control disease; and to discover the causes of disease and how they are transmitted. This laboratory complex is a critical component in the protection of the \$100 billion value of livestock production and \$10 billion in animal-product exports.

As mandated in the 1996 Farm Bill, the Secretary of Agriculture established a strategic planning task force to review current laboratory and research facilities and establish a vision that could make U.S. food, agriculture and forestry research, laboratory, and education facilities a model of first-rate science and efficiency well into the 21st century. One of the recommendations of the task force encouraged USDA to give high priority to the renovation and/or construction of integrated laboratory facilities at Ames, Iowa. This task force report supported work that USDA had initiated in 1998 to prepare a "Master Plan" that would create a single new combined laboratory facility. Earlier USDA reports, including the 1992 "Facility Condition Study," addressed the infrastructure needs at Ames and recommended providing resources for the renovation and construction of new laboratory facilities.

In order to garner support for funding of the "Master Plan" and move the plan to completion, USAHA initiated an intensive campaign based on a 32-page, 2001 special investigative edition of the USAHA newsletter that was devoted entirely to the current status, needs and future plans of and for the Ames laboratory facilities, as well as research, diagnostic and regulatory programs conducted at Ames. The campaign was directed toward all agriculture leaders that could, in turn, influence budget decision-makers in Congress. While USAHA is restricted from lobbying because of its non-profit charter, USAHA, through its elected officers and committee chairs, has pushed the issue relentlessly starting in 2000. The efforts appear to have been successful. Providing Congress appropriates President George W. Bush's requested \$178 million for the 2005 federal budget, the \$460 million facility will be fully funded with an expected completion date of 2007. The building of these facilities is the largest construction effort ever undertaken by USDA. Considering the importance of animal agriculture to this nation's existence and security, and the welfare of each and every citizen, these dollars are well spent.

Nearly concurrent with the Master Plan initiative of USAHA, the American Association of Veterinary Laboratory Diagnosticians (AAVLD), which meets annually in conjunction with USAHA, initiated efforts to establish a network of state animal diagnostic laboratories that could conduct important surveillance for foreign and emerging animal diseases and provide surge capacity to the USDA laboratories during a major disease outbreak. In addition, this laboratory network component of the national laboratory system would also strengthen current state-based laboratory testing for export of live animals and animal products, ensure that testing meets international quality standards, and enhance surveillance for diseases of international concern to expand global markets.

In 2002, with the signing of the Public Health Security and Bioterrorism Preparedness and Response Act (Bioterrorism Act), the Secretary of Agriculture was directed to develop an agricultural early warning surveillance system enhancing the capacity and coordination between state veterinary diagnostic laboratories, federal facilities and public health agencies. Congress appropriated funding in support of the Bioterrorism Act for 12 state/university animal disease diagnostic laboratories to develop capacity and surveillance programs for 8 high priority foreign animal diseases considered to be bioterrorist threats. While funding for the 12 pilot laboratories has enhanced the early warning surveillance system, additional funding is needed to support ongoing requirements for the pilot laboratories and to add additional laboratories to the network. USAHA is working closely with AAVLD and the Association of American Veterinary Medical Colleges (AAVMC) to secure that additional funding support.

USAHA has now turned its attention to another critical laboratory infrastructure. The USDA's Plum Island Animal Disease Center and Foreign Animal Disease Diagnostic Laboratory located on Plum Island off the eastern tip of Long Island, New York, are integral components of this nation's system for the safeguarding of our nation's over 1.7 billion animals. The federal government's scientists, support staff and laboratories dedicated exclusively to research and diagnosis of foreign animal diseases that threaten our mammalian livestock and equine populations with catastrophic illness are located at the Plum Island laboratory complex. The Plum Island laboratories, like the Ames facilities, have passed their expected useful life span. While the facility is still functional and able to meet all bio-safety requirements, it is technologically outdated requiring expenditure of millions each year on repairs and upgrades. A special 32-page investigative edition of the USAHA newsletter devoted entirely to the Plum Island laboratories was published in 2003 and addressed the current status, needs and future plans of and for the laboratory facilities, as well as the research, diagnostic and regulatory programs carried out on Plum Island.

While the Plum Island laboratory needs are urgent, the solution to the issue has yet to be found, USAHA continues to bring all stakeholders to the table to discuss and reach consensus on an approach to preserve the

functions that occur at the facility and provide the necessary funding for the construction of new facilities. USAHA has forged partnerships to assist in this endeavor, including with the American Veterinary Medical Association, AAVMC and the animal agriculture industries as a force multiplier to reach consensus and support.

The National Animal Health Laboratory Network is critical to this nation's security. Recognizing that animal disease threats are trans-boundary (do not respect international borders) and that the animal agriculture systems are closely linked between Canada, Mexico and the United States, USAHA is working toward incorporating similar laboratory networks in all three countries into a North American Animal Health Laboratory Network. This will provide for the sharing and leveraging of animal laboratory resources for disease surveillance and early identification, response and recovery should a foreign or emerging animal disease affect any of the partners.

Avian influenza (AI) is another example of how USAHA can successfully address a complex disease issue. Highly pathogenic varieties of AI virus are considered foreign animal diseases and rapidly eliminated once identified in poultry. There have been two major outbreaks of highly pathogenic avian influenza, or fowl plague, in the United States, one in 1924-25, reappearing in 1929, and one in 1983-84. Between 1981 and 1992, USAHA sponsored three international symposiums on avian influenza.

In 1964, a new low pathogenic AI virus type was discovered in turkeys in California. Since 1964, there have been multiple outbreaks in turkeys and chickens. Because some low pathogenic varieties have the ability to mutate into highly pathogenic forms and have an impact on trade of poultry products, they are of concern and eliminated when discovered. In addition, some avian influenza viruses can affect people. Recently, USAHA, through one of its committees and associated working groups, addressed the need for a low path AI control and eradication program. Through these efforts, consensus was reached in the design of a reasonable program that addresses both commercial poultry and poultry sold in live bird markets. To the credit of all involved in the process, this effort, started in 2002, was completed in two years.

Because veterinarians are the only health professionals trained in multi-species, comparative medicine, USAHA recognized the critical importance the veterinary profession plays in addressing complex animal health issues and the protection of our nation's animal agriculture resources. Veterinarians have and will continue to be important contributors to the success of USAHA. Very early on in the history of USAHA and disease control and eradication programs, practicing veterinarians were relied upon to assist state and federal animal health agencies in their disease control and eradication efforts. Indeed, discussions were held from the very beginning of USAHA on how to best train and accredit veterinarians to assist with eradication efforts. Veterinary practitioners, through the USDA/State Veterinarian veterinary accreditation process, have served this nation well over the years in the successful control and elimination of livestock and poultry diseases. In this new environment of threats of agro- and bio-terrorism, the need for review and enhancement of the veterinary accreditation process has been underscored. Recent recommendations, including several originating from USAHA, have called for upgrading of the veterinary accreditation process in recognition that veterinarians, along with livestock and poultry owners, are the front-line defense in safeguarding this country from foreign and emerging animal diseases.

USAHA has many other animal issue challenges. To name them and adequately discuss them would take many additional pages. Included among these challenges are the transmissible spongiform encephalopathies such as chronic wasting disease in deer and elk, scrapie in sheep and bovine spongiform encephalopathy in cattle; Johne's disease in dairy and beef cattle; the active participation in the development of animal welfare standards by the World Organization for Animal Health, also known as the OIE; and the development of a national animal identification system. For every challenge there is opportunity. USAHA has seized those opportunities and utilized the tried-and-true formula of getting all stakeholders to the table, bring in the best science and, through discussion, develop consensus solutions. While it has been a very successful 108 years, the 21st century will see many more accomplishments through deliberation and consensus building in the nation's animal health forum provided by the United States Animal Health Association.