

# CATTLE — HEALTH REPORT

A National Institute for Animal Agriculture Publication

Spring/Summer 2006

## Johanns Releases NAIS Implementation Plan

Agriculture Secretary Mike Johanns recently announced the release of an implementation plan that outlines timelines and benchmarks for the establishment of the National Animal Identification System (NAIS), along with a plan for the initial integration of private and state animal tracking databases with NAIS.

"Developing an effective animal identification system has been a high priority for USDA and we've made significant strides toward achieving a comprehensive U.S. system," said Johanns. "We recognize that this represents one

### NATIONAL ANIMAL IDENTIFICATION SYSTEM

of the largest systematic changes ever faced by the livestock industry and we have welcomed suggestions from stakeholders to ensure that we continue to gain momentum. The plan we are releasing today will guide our efforts as we continue to work with our state and industry partners to implement a nationwide system."

The implementation plan continues to set an aggressive timeline for ensuring full implementation of the NAIS by 2009. It establishes benchmarks for incrementally accomplishing the remaining implementation goals to enable all components of the NAIS to be operational by 2007, and to achieve full producer participation by 2009.

Several important components have already been accomplished. These include the development of premises registration systems in

each state and the issuance of guidelines for the manufacture and distribution of animal identification numbers. More than 270,000 premises are currently registered.

### ATPS

USDA also released the general technical standards for animal tracking databases that will enable integration of private systems with the NAIS. By early 2007, USDA expects to have the technology in place, called Animal Trace Processing System or commonly known as the portal system. The animal tracking databases will record and store animal movement tracking information for livestock that state and federal animal health officials will query for animals of interest in a disease investigation.

The NAIS implementation plan is available on the Internet at [www.aphis.usda/nais](http://www.aphis.usda/nais). ●

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## Brazilian Cattle Leader Speaks on FMD



PHOTO BY LINDA L. LEAKE

Dr. Sebastiao Costa Guedes, president of CNPC (National Beef Cattle Council - Brazil), spoke on hemispheric efforts to eradicate foot-and-mouth disease (FMD) during the opening session of the 2006 annual meeting of the National Institute for Animal Agriculture. Guedes also chairs the Inter-American Group for the Eradication of FMD, or GIEFA, which is pursuing the complete eradication of FMD from the Western Hemisphere.

## Symposium inspires new disaster preparedness programs

Food is no less than a trillion dollar industry in the United States. At the farm level, animals are a whopping \$124 billion dollar industry, not to mention a major foundation of the domestic crop industries.

Dr. Christopher Hurt, an agricultural economist with Purdue University, belted out these compelling statistics to open the special symposium on Business Continuity and Disaster Recovery Planning held April 6, 2006 in conjunction with the National Institute for Animal Agriculture's annual meeting in Louisville, KY.

More than 100 stakeholders attending the landmark symposium were bombarded with eye-opening details regarding all that's at stake in the big leagues of U.S. animal agri-



*Purdue Agricultural Economist  
Dr. Chris Hurt*

culture. According to Hurt, based on a 2001 study, a foot-and-mouth disease (FMD) outbreak in this country could cost beef producers at least \$4.3 billion at the farm level, and \$2.4 billion in losses to pork producers.

Figure in projected loss of exports, loss of U.S. consumption and losses for related industries compounded by direct costs of control and inevitable indirect losses due to FMD, and all excuses to not be prepared for disaster should be washed away.

"A formal program on business continuity planning for any type of disaster affecting animal agriculture has never been done in the past," says Dr. Leonard Bull, a North Carolina State University animal scientist who chaired the symposium. "In light of recent natural disasters, most especially Hurricane Katrina, and ever present terrorist threats, business continuity planning has quickly become the single most important issue in our industry."

Symposium speakers included Dr. David Bessler, a Texas A&M University agricultural economist who addressed the 2001 United Kingdom FMD experience and the challenge of re-establishing a domestic market.

An expert panel including Dr. Jimmy Tickel with the North Carolina Department of Agriculture

and Consumer Services, Dr. Harry Snelson, representing the American Association of Swine Veterinarians, Dr. Barrett Slenning, with North Carolina State University, and Dr. Sebastian Heath, an Emergency Programs representative with USDA APHIS Veterinary Services, discussed "Stamping Out' and 'Managed' Eradication: The Best Technology."

Another major component was an expert panel discussion on controversial stop movement issues.

As a result, one tremendous benefit of the symposium, says Bull, is that it helped people identify the fact that proposed disaster lockdowns and stop movement orders of 72 hours or more have to be modified in order to keep livestock producers in business.

"Most animal production systems cannot afford much down time and in the presence of excessive down time they simply won't survive," Bull emphasizes. "For example, most animal units typically have only enough feed on hand to last 24 to 36 hours. The symposium clearly heightened awareness on the part of regulatory officials that it's critical to accommodate livestock producers with stop movement orders of less than 72 hours."

The whole issue of business continuity and disaster recovery planning needs to continue to be promoted, Bull says. "Emphasis on getting livestock producers back in business after a disaster needs to be put in front of people everywhere," he relates.

"Fortunately, the NIAA symposium has inspired stakeholders to initiate preparedness programs in a number of states."

To access the symposium presentations, check out: [www.animalagriculture.org/proceedings/2006AMProceedings.asp](http://www.animalagriculture.org/proceedings/2006AMProceedings.asp). ●

*By: Linda L. Leake  
Contributing Editor*



### Cattle Health Report

Spring/Summer 2006

*Cattle Health Report* provides the latest information on issues pertinent to cattle health initiatives, strategies, research and regulatory action. It is a communications initiative of the NIAA Cattle Health Committee and is produced in cooperation with USDA-APHIS.

Reprinting is encouraged.

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# Projected Serious Food Supply Veterinarian Shortage Poses Threat to Industry, Society

America's livestock and meat industries have one of the world's best health and safety records, but that status may be threatened in the years ahead because of a projected severe shortage of food animal veterinarians, according to the most comprehensive veterinary business study ever conducted on the current and future state of the large animal veterinary profession.

While projected demand for food supply veterinarians will increase a modest 12 percent to 13 percent between now and 2016, the research forecasts a shortfall of 4 percent to 5 percent per year. This means for every 100 food supply veterinary jobs available, there will be only 96 veterinarians available to fill them due to decreasing numbers of veterinary students choosing to practice in the fields in food supply specialties and socio-economic trends, including further declines in rural populations.

"With the American public more focused than ever on food safety and security, the role of the food animal veterinarian has never been more important," said Dr. Lyle Vogel, director of the Animal Welfare Division of the American Veterinary Medical Association (AVMA). "Needless to say, we can't afford to have a shortage of large animal veterinarians. It would be catastrophic for the industry and for society."

The research was published in three articles in the June 1, June 15, and July 1, 2006, issues of the Journal of the American Veterinary Medical Association (JAVMA). The studies, commissioned in 2004 by a coalition of

veterinarian organizations and conducted by Kansas State University's College of Business Administration focused on several aspects of the veterinarian profession: comparison of future demand and supply, veterinary student attraction to food supply careers, and career satisfaction and retention.

The findings were based on a review of current studies and literature, conduct of four focus

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DR. LYLE VOGEL  
AMERICAN VETERINARY MEDICAL ASSN.

groups, conduct of 13 expert judgment-based forecasting (Delphi) panels representing different sectors of the food supply profession, and surveys conducted with veterinary students, recent graduates, and veterinarians in practice.

Survey respondents cited several keys to keeping current food animal veterinarians in the industry, while attracting or converting more students to this specialty. Strategies that received strong support from educators included:

- Recruiting/admissions strategies, including putting more emphasis on food animal careers at high schools and offering special incentives to those who choose the food animal career track, such as reserved class spots,

early admissions, scholarships, and mentoring/ shadowing programs with industry partners.

- Curriculum/financing strategies, including assigned faculty mentors, paid externships, heavier clinical caseloads, more hands-on experience early on, and legislation that forgives student loans for those who take a job in state.

- Industry image strategies, including creating regional centers of food animal medicine, improving business literacy within the profession, and shared curricula or rotational programs with partner colleges.

- Veterinary students who switched to a career focus in food supply overwhelmingly said it was because they were exposed to information about the specialty in veterinary school. More than 70 percent of educators said the main reason veterinary students choose a food animal sequence today is because they are attracted to the rural lifestyle and the prospect of working with animals, while only 6 percent choose it because they can make a positive impact on agriculture or food production.

A high percentage of both recent graduates (78 percent of young beef veterinarians and 80 percent of young dairy veterinarians) and senior alumni (92 percent for both beef and dairy veterinarians) are satisfied with their jobs and 90 percent of both groups are proud of their profession.

A copy of the Food Supply Veterinary Medicine Coalition Report can be viewed on the Internet at [www.avma.org](http://www.avma.org). ●

## Scientists Develop Rapid Diagnostic Test for FMD and Six Other Livestock Diseases

Lawrence Livermore National Laboratory (LLNL) scientists, in partnership with the federal Homeland Security and Agriculture departments and the University of California, Davis, have developed a rapid diagnostic test that simultaneously tests for foot-and-mouth disease and six other look-alike diseases in livestock.

The new candidate test, which is still undergoing the process of validation, reduces the period for diagnosing all seven diseases from days to hours, and could significantly reduce costs.

In addition to the test, team researchers have made two other important advances – in testing samples and tracking samples – that could provide a major boost in routine agricultural disease surveillance and fighting any instances of agroterrorism.

The U.S. Department of Homeland Security (DHS) has funded the efforts to develop high-throughput multiplexed assays for early detection of foreign animal diseases, such as foot-and-mouth disease.

"While still in the development phase, this collaborative project between the DHS Plum Island Animal Disease Center, LLNL, UC Davis, the U.S. Department of Agriculture (USDA) Animal and Plant Health Inspection Service and the National Animal Health Laboratories Network (NAHLN) will significantly enhance the future security of U.S. agriculture by providing improved technology

for animal disease diagnostics," said Tammy Beckham, deputy director of science for the DHS at the Plum Island Animal Disease Center.

"The test provides a tool that could be used for surveillance, which would significantly enhance the nation's capacity for early detection of foot-and-mouth disease (FMD)," said LLNL veterinarian and team member Pam Hullinger. "Finding the first case



***"Finding the first case of FMD as soon as possible is critical to minimizing the scope and impact of an outbreak."***

DR. PAM HULLINGER  
LLNL VETERINARIAN

of FMD as soon as possible is critical to minimizing the scope and impact of an outbreak."

One estimate is that the U.S. would lose up to \$3 million in direct costs for every hour's delay in diagnosing FMD.

Barbara Martin, the NAHLN coordinator for the USDA, also stresses how the test or assay, once it is deployed to the NAHLN, would assist detection.

"With an assay capable of detecting a foreign animal disease, we'll be able to detect it early, and reduce the spread and the economic impact of the disease," Martin said.

Under current procedures, if a foreign animal disease is suspected in livestock, tests are first conducted for the foreign animal disease and later, if the tests are negative, then tests are conducted for

domestic diseases that resemble FMD.

Once approved, with the multiplex assay NAHLN laboratories could test for all seven diseases at the same time – within about five hours.

The concept of an assay that could test for multiple livestock diseases grew out of the 2001 outbreak of FMD in the United Kingdom that caused about \$5 billion in losses to the food and agriculture sector and even greater losses in tourism. Up to 10 million sheep, pigs and cows were slaughtered, and for several months, the nation was banned from exporting livestock and animal products that could potentially transmit the virus.

"What the U.S. veterinarians who went to England really wanted was a test for confirming FMD with a quick turnaround, so they could make a decision on how to handle the individual farms," said Alex Ardans, director of the UC Davis-operated California Animal Health and Food Safety Laboratory System.

UC Davis researchers helped to provide vision and key direction for the assay's development and also provided samples of domestic livestock viruses, which were important in the development of the multiplex assay.

The assay screens for both DNA and RNA viruses at the same time and uses 17 signatures – unique regions of DNA or RNA – to assist in detecting FMD and the six other diseases that resemble FMD.

Three of these are the foreign diseases FMD, vesicular exanthema of swine and swine vesicular

disease. Four are the endemic diseases bovine viral diarrhea, blue-tongue, bovine herpes-1 and the parapox virus complex.



*To test LLNL's multiplexed assay, analytical chemist Dr. Ben Hindson collected samples at a dairy farm near Davis, Calif.*

Initial studies to determine the performance characteristics of the assay are being performed at LLNL, DHS' Plum Island Animal Disease Center, NVSL and within the NAHLN. For the work, Plum Island provided scientific expertise, vision, viral isolates and lab space. Development work is continuing at LLNL and Plum Island.

FMD is an extremely contagious viral disease of cattle, pigs, sheep, goats, deer and water buffalo. Animals afflicted with FMD usually do not die, but the disease is debilitating and animals do not recover. The vaccine for FMD only reduces the severity of symptoms; it does not prevent infection or completely stop transmission of the disease.

"The availability of a validated, rapid test for detecting FMD and differentiating it from other diseases that present similar clinical signs would be invaluable," said LLNL analytical chemist and team member Ben Hindson.

As part of its validation process, the assay has been sent to 13 NAHLN labs and the USDA

Foreign Animal Disease Diagnostic Laboratory, which participated in an interlaboratory comparison and will be performing follow-on evaluations of the test. In the months to come, the USDA's Animal and Plant Health Inspection Service will determine how the assay will be used.

For the assay, one other important collaborator has been Canada's National Center for Foreign Animal Diseases based in Winnipeg. The National Center provided research space and access to its extensive library of samples from FMD-infected animals. It has also assisted with the development of other assays.

Beyond the assay, the interagency team also has developed a high-throughput, semi-automated system that permits the analysis of 1,000 animal specimen samples within a 10-hour period using two robotic workstations and two technicians.

This platform increases the normal sample processing capacity by about 10-fold per day.

"Timely and scalable diagnostic surge capacity is a critical component of any animal health emergency response," Ardans noted, adding that with more workstations and technicians many more samples could be processed.

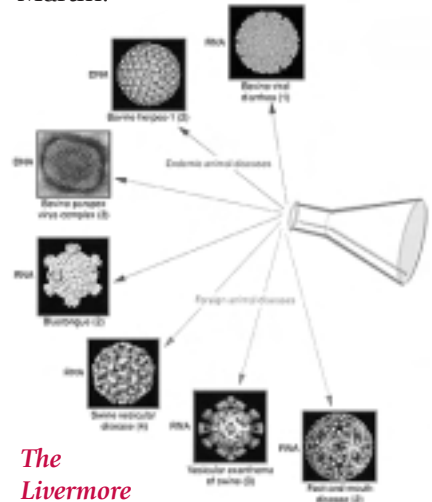
One added benefit of the team's new high-throughput capacity is that the platform is adaptable for use with other assays, including those that test for human diseases, and hence could contribute to any public health system response.

The other important advance is the integration with USDA's information technology system for tracking animal samples that has been developed by the federal department between 2003 and 2006.

The goal is for veterinarians or

animal health officials to be able to take and track a sample from an animal all the way through the process – from the animal to the lab to the diagnostic test and to the transmission of the results," said USDA's Martin.

With this capability, the sample could be rapidly traced back to the herd of origin and the affected animal, thus minimizing the risk of the disease's spread, according to Martin.



*The Livermore assay tests for three foreign animal diseases and four endemic diseases. Electron micrographs of each virus are shown. Numbers in parentheses denote the number of signatures the assay uses to detect each disease.*

The USDA is using a standardized sample tracking and reporting process with bar codes to identify each sample and relies on a secure network to transmit information to laboratories in the NAHLN system.

Founded in 1952, Lawrence Livermore National Laboratory has a mission to ensure national security and to apply science and technology to the important issues of our time. Lawrence Livermore National Laboratory is managed by the University of California for the U.S. Department of Energy's National Nuclear Security Administration. ●

## Kurt Zuelke Named New Director of NADC

Animal reproductive physiologist Kurt A. Zuelke is the new director of the U.S. Department of Agriculture's National Animal Disease Center (NADC) in Ames, Iowa, effective May 28.

ARS Administrator Edward B. Knippling said Zuelke, who for the past five years has served as research leader at the agency's Biotechnology and Germplasm Laboratory in Beltsville, Md., was officially appointed in April after a yearlong international recruitment process.

Knippling said Zuelke's recent research focused on discovering and understanding the molecular mechanisms that lead to early embryonic death in swine. Zuelke also oversaw research at Beltsville employing biotechnology to combat mastitis in dairy cattle. Scientists at the

Biotechnology and Germplasm Laboratory have produced transgenic dairy cattle that secrete a novel antimicrobial protein in their milk that makes them resistant to mastitis caused by bacteria known as *Staphylococcus aureus*.

Knippling added that Zuelke had ushered in a new era of functional genomics research at the Beltsville laboratory by pioneering the application of serial analysis of gene expression and proteomics—known as SAGE—to improve the genetic, reproductive and productive efficiency of livestock and poultry.

Zuelke also led a partnership between four laboratories within ARS' Henry A. Wallace Beltsville Agricultural Research Center that established a world-class mass spectroscopy and proteomics facility

devoted to animal and natural resources and to plant science.

Prior to serving with ARS, Zuelke was with the Victorian Institute of Animal Science in Attwood, Australia, where he served as dairy transgenic research program leader, co-investigator/developer for the bovine genomics research program, and senior research embryologist.

Zuelke, a native of Wisconsin, earned a B.S. in animal science from the University of Wisconsin-River Falls in 1984, and a Doctorate of Veterinary Medicine from the University of Minnesota-St. Paul in 1988. Additionally, he earned a Ph.D. in physiology from the University of Georgia-Athens in 1992. ●

## Shooting for a Better Way to Vaccinate

Bison at the National Animal Disease Center (NADC) in Ames, Iowa, are helping scientists find better ways to immunize wildlife against disease. The research is part of a ballistic approach to vaccinating wildlife against brucellosis, an infectious disease of both animals and humans that's especially feared by cattle producers.

Specifically, the scientists—veterinary medical officer Steven Olsen, of NADC's Bacterial Diseases of Livestock Research Unit, and chemistry professor David W. Grainger and graduate student Jim Christie, of Colorado State University's chemistry department in Fort Collins—are seeking better ways to remotely inject free-ranging bison with RB51, the most effective vaccine available against brucellosis in cattle.

Brucellosis is an incurable infection that in animals induces abor-

tions, decreases fertility, and reduces milk production. Its bacteria can also be transmitted to humans—through contact with infected animals or consumption of unpasteurized dairy products—and cause undulant fever, an affliction characterized by severe flu-like symptoms.

A problem for cattle ranchers since the 1840s, brucellosis has been nearly eradicated in this country, mostly through cooperative federal and state programs begun in 1934. But its spread through wildlife has rekindled concerns in cattle producers, who suffer severe economic losses when their herds are infected.

The work involves testing a new version of a biodegradable projectile. Developed and trademarked under the name "Biobullet," by Solidtech Animal Health, Inc., of



*Bison at the National Animal Disease Center in Ames, Iowa, are helping scientists find better ways to immunize wildlife against disease.*

Newcastle, Oklahoma. A new method of preparing the vaccine pellet—developed at Colorado State and tested at NADC—places the RB51 into a gel rather than a compressed pellet. The gel protects the live bacteria in the vaccine, perhaps making it more effective, says Olsen.

Olsen notes that "...ballistic methods are less effective than the conventional injected vaccination. The goal is to find a way to make ballistic delivery just as effective..." ●

*Adapted from USDA: ARS*

## Johnesdisease.org Website is Newest Resource

Johne's disease has significant economic impacts for many producers, providing a primary reason to control and work toward elimination of the disease. The potential association of *M. paratuberculosis*, the bacteria that causes Johne's disease, with human health concerns is another important reason for producers to proactively address the disease.



*Dr. Ken Olson*

A primary objective of the July 2004 Strategic Plan for the National Johne's Disease Control Program, and in the 2005 update, is improvement of national education efforts relative to Johne's disease. Surveys have demonstrated increased producer awareness of Johne's disease, but participation in state and national programs remains limited.

The Johne's Education Initiative (JEI), part of a National Institute for Animal Agriculture grant funded by USDA's Animal and Plant Health Inspection Service, seeks to make well documented information on Johne's disease easily available for producers and those who work with them resulting in additional participation in Johne's control programs. Through increased awareness of programs and rapid access to information, producers can more easily participate in programs and minimize the impact of the disease in their herds. The initiative also facilitates the exchange of information and materials between state programs.

The most visible part of the JEI is the website [www.johnesdisease.org](http://www.johnesdisease.org) (Johne's

Information Central). Information related to state, national and international programs, as well as links to specific programs and information, is available through this location. Other producer and animal health related site are encouraged to provide links to the site.

One widely used section covers "State Programs." This area, featuring a U.S. map with states identified, is designed to help producers find information about the Johne's program in their state. Clicking on a state brings up contact information for the Designated Johne's Coordinator (DJC) and other resource people in the state as well as "hot links" to Johne's related websites for that state. Contact information and links are updated as new information becomes available.



Another section features "Program Herds." Clicking on a state opens a listing of herds participating in the program provided by the individual state. While the number of states making this information available is currently limited, the listing does two things. It provides added recognition for program herds who wish to be recognized and is also a way that participating producers may find sources of seed stock or replacement animals from herds at a comparable program level to their own. This should provide added value for these animals.

Another new area is "State Materials." This has been designed to facilitate the exchange and use of materials between states. State program leaders are encouraged to post the best of their materials in this area so other states may access them for use in their programs. Credit needs to be provided for the originating state, but through the site we are seeking to better utilize good materials that have been developed.

Additional outreach activities are underway and will be expanded in the future. Producer publications are including more information related to Johne's disease. The 2006 Joint Dairy and Animal Science Annual Meeting will include a specific Johne's section, providing an opportunity to highlight current research and outreach activities. It also allows professionals who work with producers to gain additional knowledge about the disease and ongoing programs. Meetings with interested producer groups are being held as well as interaction with international contacts working with education outreach in other nations. While these new activities are developing, work continues to move forward with the Johne's Disease Committee of the U.S. Animal Health Association, the National Johne's Work Group and the Johne's Disease Integrated Programs (JDIP).

Questions, comments and suggestions relative to the Johne's Education Initiative may be directed to the JEI Coordinator, Dr. Ken Olson at [kolson@animalagriculture.org](mailto:kolson@animalagriculture.org). ●

*Kenneth E. Olson, Ph.D., PAS, was recently appointed NIAA's Director of Educational Programs.*

## ID/INFO EXPO 2006 to Highlight Practical Animal ID Solutions

The National Institute for Animal Agriculture (NIAA) has announced plans for ID/INFO EXPO 2006, a national conference and trade show devoted to animal identification and information systems technology. This year's event will take place, August 22-24 in Kansas City, Mo.

"We are expecting a great meeting for the latest information in animal identification," said R. Scott Stuart, NIAA Chairman of the Board and CEO of the National Livestock Producers Association. "Our planning committee is working diligently in finalizing what looks to be an excellent program."

A trade show, showcasing a variety of animal identification and information systems technology, will take place on

# ID•INFO EXPO 2006

August 22 & 23. In addition to the trade show, ID/INFO EXPO 2006 will feature:

### August 22:

- Pre-Conference seminar outlining the basics of NAIS with exclusive species working group reports and a review of pending revisions to ISO standards.
- An in-depth seminar looking at key elements of USDA's IT Infrastructure, specifically the AIN Management System and the recently announced Animal Trace Processing System (ATPS).
- A half-day of technology seminars from the leading developers, suppliers, and information managers engaged in animal identification and traceability.

### August 23:

- Agriculture Secretary Mike Johanns has been invited to provide the keynote address.

- A review of state legislative efforts to implement the National Animal Identification System (NAIS), including legal authority and FOIA (Freedom of Information Act) issues.
- A review and discussion on ongoing NAIS education and outreach efforts.
- A panel discussion featuring NAIS proponents and opponents discussing the merits of a national animal identification system.

The third and final day will go beyond NAIS with a complete focus on the practical application of animal ID solutions. Presentations and discussion will highlight current services and value-added programs that have already been implemented and are working for producers.

Online registration is now open. NIAA is offering membership and early registration discounts. Information, including registration, lodging, and preliminary schedule of events, is available on the Internet at [animalagriculture.org/id/IDINFOEXPO2006/Default.htm](http://animalagriculture.org/id/IDINFOEXPO2006/Default.htm), or by calling 270-782-9798. ●

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