

Sheep & Goat HEALTH REPORT

A National Institute for Animal Agriculture Publication

Spring/Summer 2006

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 sup-

ply 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

"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."

DR. LYLE VOGEL
AMERICAN VETERINARY MEDICAL ASSN.

zations 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 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 legisla-

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 organi-

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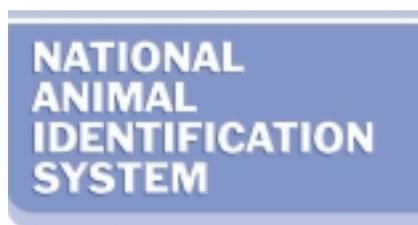
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Johanns Releases NAIS Implementation Plan

Agriculture Secretary Mike Johanns has 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 of the largest systematic changes ever faced by the livestock industry."

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.

"We have a plan in place and we need producers to take the first step by registering for a premises identification number," said Jim Niewold, a pork producer from Loda, Ill., and member of the Swine ID Implementation Task Force.

"The program was developed by producers to protect animal health. Voluntary implementation of the program by our industry will help us transition smoothly . . ." Niewold said.

Standards for Database Integration

USDA also released the general technical standards for animal tracking databases that will enable integration of private systems with the NAIS. Private data-

base owners are invited to submit applications for system evaluation to USDA and offer feedback as the final technical requirements are established. USDA will then enter into cooperative agreements with owners of databases that meet the standards. The application for system evaluation and a draft cooperative agreement are available on the NAIS web site at www.usda.gov/nais.

By early 2007, USDA expects to have the technology in place, called the 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 only for animals of interest in a disease investigation.

USDA's Animal and Plant Health Inspection Service (APHIS) is also finalizing \$3 million in funds that will be awarded to a number of states and tribes to conduct field trials to analyze information pertaining to animal identification. Field trials will focus on the evaluation of new technologies for animal identification and automated data collection. APHIS will also fund an economic study focusing on the cost of NAIS implementation within a state; the development of procedures to measure the performance of identification devices and a bi-state study to develop recommendations regarding livestock exhibitions to achieve compatibility with the NAIS.

The NAIS implementation plan, along with more information about the program, is available at www.usda.gov/nais. ●

Sheep & Goat Health Report
Spring/Summer 2006

Sheep & Goat Health Report provides the latest information on issues pertinent to swine health initiatives, strategies, research and regulatory action. It is a communications initiative of the NIAA Sheep & Goat Health Committee and is produced in cooperation with USDA-APHIS. Reprinting is encouraged.

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ID/INFO EXPO 2006 to Highlight Practical Animal ID Solutions

The National Institute for Animal Agriculture (NIAA) is coordinating ID/INFO EXPO 2006, a national conference and trade show devoted to animal identification and information systems technology. This year's event is being held August 22-24 at the Westin Crown Center 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 has worked diligently to finalize what looks to be an excellent program."

A trade show, showcasing a variety of animal identification and information systems technology, will take place on August 22 & 23. In addition to the trade show, ID/INFO EXPO 2006 will feature:

August 22:

- Pre-Conference seminar out-

ID • INFO EXPO 2006

lining 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 will 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.

Information, including registration, lodging, and schedule of events, is available on the Internet at animalagriculture.org/id/IDINFOEXPO2006/Default.htm, or by calling 270-782-9798. Proceedings and highlights of the meeting will also be posted on this site following the meeting.



American Dairy Goat Association Issues Position Statement on NAIS

ADGA supports the concept of a national animal identification system for purposes of trace-back in emergency situations, with the understanding that there are concerns which must be addressed as to issues of privacy, cost and implementation.

ADGA supports requiring the data system be kept confidential and exempt from disclosure under the Freedom of Information Act. Further, ADGA supports that this system be USDA-maintained and cannot support a sole-source privatized data system.

ADGA believes that the unit cost per animal for identification and tracking will place undue burden upon those that do not benefit from the economies of scale that will be available to larger livestock producers.

ADGA can only support monitoring activities considered high risk commingling events as defined through the efforts of the Sheep and Goat Species Working Groups.

ADGA is concerned that established methods of identification will be discarded in favor of a one size fits all identification device

which would not be reliable or cost-effective for use on small ruminants.

ADGA supports using the methods of identification accepted under the National Scrapie Eradication Program pending future advances in reliable and cost-effective identification systems for small ruminants.

ADGA also encourages its members to remain engaged in NAIS by providing input through the Species Working Groups and other designated state and federal forums. ●

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



"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

Hullinger. "Finding the first case 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.

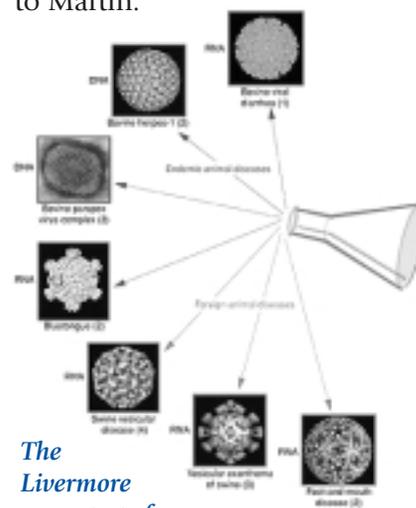
"Timely and scalable diagnostic surge capacity is a critical component of any animal health emergency response," Ardans noted, adding that with more workstations and technicians many more samples could be processed.

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. ●

Opening General Session of the 2006 NIAA Annual Meeting

Globalization Drives the Need for Adjustments in All Aspects of Veterinary Services

Globalization and the ever-increasing speed and volume of movement of people and products is driving the need for substantial changes in the way veterinary services are provided, according to a wide array of experts who spoke at the opening session of the annual meeting of the National Institute for Animal Agriculture (NIAA).

Whether updating the association's members on specific diseases such as avian influenza (AI) and foot and mouth disease (FMD) or analyzing how animal diseases, including those that can potentially infect humans, can and do spread, the panel of international experts agreed that veterinary services around the world must shift from simply a disease prevention and control mind set to a broader perspective that includes risk management.

"We have to understand what we are doing not only affects the well being of animals, it may also affect the health and nutrition of millions of people around the world," pointed out Dr. Kevin Walker of Michigan State University as he described a confluence of animal and public health. "We have to figure out how we deal with zoonotic diseases such as the H5N1 AI virus that we're hearing so much about as well as those diseases such as FMD



Dr. Will Hueston

that have the potential to devastate animal agriculture and thus the supply of animal protein at home and abroad."

In summing up the afternoon's messages, Dr. William Hueston, director of the Center for Animal Health and Food Safety at the University of Minnesota and the moderator of the session, said that collectively the speakers made six main points regarding globalization and the speed of movement. Veterinary Services will require:

- Global and regional surveillance strategy;
- A flexible response system;
- New core competencies;
- New international partnerships;
- Narrowing the cultural divide that separates public and animal health; and
- Shifting the paradigm from disease prevention to risk management.

All of which fit well into the theme of the 2006 NIAA Annual Meeting, "Business Continuity and Disaster Recovery Planning." ●

Scrapie Eradication: By the Numbers

2,014

flocks participating in the Scrapie
Flock Certification Program

15

newly enrolled or certified flocks
in the month of May

93

known scrapie infected and
source flocks in the U.S

67

new infected and sourced flocks for FY'06

53

infected and source flocks released in FY'06

0.79:1

ratio of infected and source flocks released to
newly infected and source flocks for FY'06

18

scrapie cases in goats since 1990

86,845

RSSS samples collected since April 1, 2003

103

slaughter plants submitting RSSS samples

26,185

samples tested for scrapie in FY'06

112,979

sheep and goat premises assigned
identification number in the
Scrapie National Generic Database

* Data as of May 31, 2006

Source Flock =

RSSS, or Regulatory Scrapie Slaughter
Surveillance = a targeted slaughter
surveillance program which is designed to
identify infected flocks for clean-up.

USDA Proposes Changes to the Veterinary Accreditation Program



The U.S. Department of Agriculture's Animal and Plant Health Inspection Service is proposing to amend the regulations regarding the National Veterinary Accreditation Program to establish two accreditation categories in place of the current category, add requirements for supplemental training

and renewal of accreditation, and offer accreditation specializations.

Under the proposed rule, Category I would authorize veterinarians to perform accredited duties on companion animals only. Veterinarians would be authorized to perform accredited duties on all species to include poultry, equines and livestock under Category II. The new two-tiered system would replace the current structure under which an accredited veterinarian is authorized to perform accredited duties on all species.

APHIS is proposing these changes in order to support its

animal health safeguarding initiatives, to involve accredited veterinarians in integrated surveillance activities and to make the provisions governing the National Veterinary Accreditation Program more uniform and consistent.

These proposed changes would increase the level of training and skill of accredited veterinarians in the areas of disease prevention and preparedness for animal health emergencies in the United States.

Notice of this proposed rule was published in the June 1 *Federal Register*. ●

ERS Issues 2005 Family Farm Report

USDA's Economic Research Service has issued the 2005 Family Farm Report, part of a series of reports that provide agricultural policymakers with detailed information on how farming in the United States is organized.

The study found that 98 percent of U.S. farms, using 2003 data, are family farms. Family farms are defined as operations organized as proprietorships, partnerships, or family corporations that do not have hired managers.

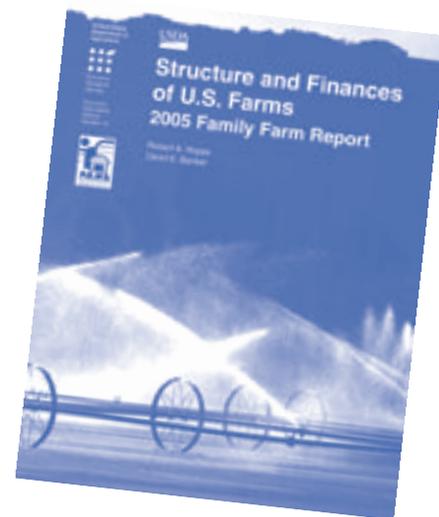
Small family farms account for most U.S. farms and hold most farm assets, accounting for 91 percent of U.S. farms, 71 percent of all farm assets and 70 percent of farmland.

However, very large family farms and non-family farms produce a growing share of agricultural output. Large and very

large family farms, plus non-family farms, made up nine percent of farms in 2003, but accounted for 73 percent of the value of production.

Shifts in production away from small farms with sales below \$250 thousand will likely continue, the report says, given their negative operating profit margin (on average) and the large, growing share of their operators who are at least 65 years old.

With average operating profit margins and average rates of return on assets and equity being negative for small farms, but positive for large, very large, and non-family farms, how do so many small farms continue to exist? According to the report, small-farm households typically receive substantial off-farm income and do not rely primarily on the farms for their



livelihood. Most off-farm income is from earned sources, either wage-and-salary jobs or self-employment.

Combining farm and off-farm income, the median farm household income in 2003 (\$47,600) was 10 percent greater than the median for all U.S. households (\$43,300).

The full report can be obtained on the Internet at www.ers.usda.gov/publications/eib12. ●

Sheep Industry Leaders Convene in Kansas City to discuss Scrapie Eradication with Government Officials

The American Sheep Industry Association (ASI), in conjunction with USDA, APHIS, Veterinary Services (VS), hosted a meeting June 29 to discuss scrapie eradication in the United States. Approximately 25 industry leaders and state and federal government officials convened in Kansas City to review past progress, current efforts and future goals for the Accelerated National Scrapie Eradication Program.

USDA's Dr. Dianne Norden reported that the number of positive animals appears to be declining to a current level of about 0.4 percent, indicating progress is being made in the program. In discussing surveillance and traceback efforts over the past two years, stakeholders at the meeting recommended strict

enforcement of current regulations to address identification deficiencies and traceback challenges.

A rectal biopsy procedure on live animals is being evaluated as a live animal test for scrapie, reported Dr. Diane Sutton, national scrapie program coordinator for VS. Sutton said the test appears to be working well and offers advantages over the third eyelid test.

Stakeholders also had an opportunity to review and discuss possible changes to the *Code of Federal Regulations* (CFR) relative to the scrapie eradication program. Any proposed changes will likely not be published before late in the year.

Other topics discussed included sheep ID and the National Animal Identification System, scrapie eradi-



Dr. Diane Sutton addresses sheep industry leaders in Kansas City. The American Sheep Industry Association hosted the gathering.

cation education and outreach efforts, and Mobile Information Management (MIM), a system designed to facilitate the electronic capture and use of data generated through the scrapie eradication program.

Additional information about the program can be obtained on the Internet at ASI's website, www.sheepusa.org, at USDA's website www.aphis.usda.gov/scrapie or at www.animalagriculture.org/scrapie. ●

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Veterinarian Shortage (cont'd from page 1)

tion 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. ●