
# Animal Identification: Overview and Issues

**Randy Schnepf**
Specialist in Agricultural Policy

September 21, 2009

**Congressional Research Service**
7-5700
www.crs.gov
R40832

**CRS Report for Congress**
*Prepared for Members and Committees of Congress*

# Summary

Many countries that participate in international markets for livestock and animal products have in place some form of animal identification (ID) and traceability system. Initially, animal ID and traceability programs were designed to protect animal health, but in several countries they have been extended to encompass food safety concerns, or have been subsumed by such concerns. A new and emerging concern is that animal ID and traceability may soon become not just an animal health and food safety management tool, but a market access requirement as well.

In the United States, livestock industry groups, animal health officials, and the U.S. Department of Agriculture (USDA) have been working to establish a nationwide animal ID system capable of tracking animals from birth to slaughter, in order to respond quickly to animal disease outbreaks—thereby limiting their economic impact—and to satisfy foreign market specifications. A draft plan, first released in 2002, has evolved into the current national animal ID system (NAIS). NAIS is being undertaken in three steps: first is premises registration, second is animal identification, and third is animal tracing from origin to point of slaughter. Currently, NAIS is implemented on a voluntary basis. While certain states and private organizations already have their own animal ID programs, NAIS is intended to harmonize procedures, record-keeping, and databases across animal species and state borders, and to extend the program nationwide.

In several other countries with large animal populations—for example, Australia, Canada, the European Union (EU), Japan, and South Korea—animal ID and traceability is mandatory. Furthermore, several of these same countries—the EU, Japan, and South Korea in particular—have extended the traceability component of the national animal identification systems to include traceability of animal products from the point of processing (or slaughter) to the consumer. As a result, animal ID and traceability is treated as both an animal health and a food safety tool in these countries. The possibility of similar information requirements for animal products traded in international markets appears to be increasing.

Not all U.S. livestock producers support the evolving new program, fearing it will be costly and intrusive. The poultry and pork industries have endorsed a mandatory national animal ID program in general, while certain portions of the U.S. cattle industry have shown strong resistance to what they perceive as government intrusion in their private affairs. Participation in the initial phase of the NAIS—premises registration—reflects this same degree of interest, as very high percentages of eligible premises are registered in the NAIS for most major animal species—poultry (95%), sheep (95%), swine (80%), goats (60%), and horses (50%)—with the exception of cattle (18%). USDA has stated that such a low participation rate for cattle renders NAIS ineffective as a tool for controlling animal disease, and that a much higher participation rate is necessary to respond effectively to an animal disease outbreak. As a result, USDA has argued that Congress should either expand incentives to increase the NAIS participation rate for cattle or to consider making the program mandatory.

Recently, key committee leadership in Congress has shown its own frustration with the slow pace of NAIS implementation and has reduced annual funding appropriations for the program. Lawmakers in the 111th Congress continue to monitor USDA's work on the program and could propose legislation aimed at shaping its scope, design, and pace of implementation.

# Contents



## Figures



## Tables

## Appendixes



## Contacts

# Introduction and Overview

Major outbreaks of harmful animal diseases—including avian influenza (AI), foot and mouth disease (FMD), and bovine spongiform encephalopathy (BSE, or mad cow disease)—have led to the slaughter of millions of commercial animals and caused billions of dollars in economic damages (**Table 1**). The economic harm from these disease outbreaks first hits the farm enterprise that suffers direct loss of its animals and its livelihood. But it also extends well beyond the farm place to disrupt domestic and international markets, causing losses all along the marketing chain and ultimately hitting consumers.

**Table 1. Major International Animal Disease Outbreaks and Their Economic Costs, Selected Incidents Since 1986**

| Year | Disease | Species | Location | Economic Cost | Resultant Livestock Cull |
|---|---|---|---|---|---|
| 1986-1988 | BSE[a] | Cattle | United Kingdom | ~$6 billion | 3.7 million cattle |
| 1997 | FMD[b] | Swine | Taiwan | ~$7 billion | 3.8 million hogs |
| 1997 | Classical swine fever[c] | Swine | Netherlands | $2.3 billion | 12 million hogs |
| 1998 | Avian Influenza[d] | Poultry | Hong Kong | na | Entire poultry population of HK |
| 2000 | Classical swine fever | Swine | United Kingdom | na | 9 million hogs |
| 2001 | FMD | Cattle, Sheep, Swine | United Kingdom | $6.7 billion | 10 million cattle, hogs, & sheep |
| 2003-2006 | Avian Influenza | Poultry | Asia, Africa, Middle East, Europe | na | ~250 million poultry |

**Source:** Compiled by CRS from various sources.

**Note:** na = not available. This table is not intended to be a comprehensive listing of all outbreaks, but focuses instead on selected incidents relevant to livestock production activities in the United States.

a. Bovine spongiform encephalopathy (BSE), commonly known as mad cow disease, is a fatal, neurodegenerative disease in cattle that causes a spongy degeneration in the brain and spinal cord. BSE-contaminated meat consumption has been linked to a human variant of Creutzfeldt-Jakob Disease, according to the World Health Organization.

b. Foot-and-mouth disease (FMD), or hoof-and-mouth disease (Aphtae epizooticae), is a highly contagious and sometimes fatal viral disease of cloven-hoofed animals, including domestic animals such as cattle, water buffalo, sheep, goats, and pigs, as well as antelope, bison and other wild bovids, and deer. It is caused by foot-and-mouth disease virus. FMD does not transmit to humans.

c. Classical swine fever (CSF), or hog cholera is a highly contagious disease of pigs and wild boar.

d. Avian influenza (H5N1), commonly known as bird flu, refers to influenza caused by viruses adapted to birds. Of greatest concern is highly pathogenic avian influenza (HPAI). Avian influenza (H5N1) can infect and kill humans from bird-to-human contact.

To date, the United States has been fairly fortunate in avoiding a catastrophic animal disease outbreak of the nature of the FMD events that occurred in Taiwan in 1997 or the United Kingdom in 2001. Were a similar FMD outbreak to hit the United States, the economic consequences could be staggering—possibly in the range of $30 billion to $100 billion in cost to the U.S. cattle industry alone, according to House Agriculture Committee Chairman Collin Peterson in remarks

made at a March 11, 2009, hearing by the subcommittee on Livestock, Dairy, and Poultry to review animal identification systems.[1]

The economic consequences of major animal disease outbreaks that occurred during the 1990s and early 2000s provided the impetus for the development and implementation of animal identification (ID) and traceability systems in many countries.[2] The motivation and nature of these programs varies across countries, ranging from voluntary programs focused on animal health as in the United States, to mandatory programs focused on both food safety and animal health as in the European Union (EU), Japan, and South Korea (**Figure 1**).[3] More recently, some major importers of animal products, Japan and South Korea in particular, have begun to discuss the possibility of requiring traceability on imported meat products, which, if undertaken, would add a further dimension—market access—to animal ID and traceability programs.

Any developments that occur in domestic or international markets with respect to animal health, food safety, and import standards have potentially significant economic importance for U.S. livestock industries because the United States is a major producer and exporter of livestock and animal products (**Table 2**). The United States is the world's leading producer of beef and poultry and ranks third in pork production behind China and the EU (see tables in **Appendix B**). With respect to trade in animal products, the United States is the world's leading exporter of pork, the second-leading exporter of poultry (behind Brazil), and the third-leading exporter of beef, while ranking first as the world's leading importer of beef. In addition to these global rankings, U.S. exports of animal products account for substantial portions of total use of domestic production—17% for both pork and poultry, and 6% for beef, in 2007 and 2008.[4]

This report provides background on animal ID and traceability in general, and the development of the current U.S. system of animal ID and traceability in particular. In addition, it reviews the claims and counter-claims of proponents and opponents of a national animal ID system, and describes many of the unresolved issues related to program development. Finally, two appendixes offer a brief chronology of the development of the U.S. NAIS, and a brief description of the major international organizations involved in setting standards and rules for animal health and trade in animal products, along with summary descriptions of animal ID and traceability programs found in other major livestock producer and consumer countries.

[1] Public hearing to review animal identification systems, House Committee on Agriculture's Subcommittee on Livestock, Dairy, and Poultry held a March 11, 2009; http://agriculture.house.gov/hearings/index.html.

[2] For examples of animal disease outbreaks and their impact on international trade see "Economic Effects of Animal Diseases Linked to Trade Dependency," *Amber Waves*, Vol. 4, Issue 2, Economic Research Service (ERS), USDA, April 2006; CRS Report R40575, *Potential Farm Sector Effects of 2009 H1N1 "Swine Flu": Questions and Answers* , by Renée Johnson; CRS Report RS21709, *Mad Cow Disease and U.S. Beef Trade*, by Charles E. Hanrahan and Geoffrey S. Becker; or "How Highly Pathogenic Avian Influenza (H5N1) Has Affected World Poultry-Meat Trade," LDP-M-159-02, Fawzi A. Taha, ERS, USDA, October 2007. For an analysis of the potential economic costs of an FMD outbreak see *Economic Impacts of Foreign Animal Disease*, Econ. Research Report No. 57, Philip L. Paarlberg, Ann H. Sietzinger, John G. Lee, and Kenneth H. Mathews, ERS, USDA, May 2008.

[3] International animal ID programs are discussed in the appendix of this report.

[4] U.S. beef exports accounted for 9% of total disappearance during the five years prior to the discovery of a BSE-infected cow in the U.S. cattle herd in December 2003.

**Table 2. U.S. Meat Exports, Ranked by Country of Destination**

(average for calendar years 2007 and 2008; $ millions)

| | Beef and Veal | | | Pork | | | Poultry | | |
|---|---|---|---|---|---|---|---|---|---|
| **Rank** | **Country** | **Million $** | **%** | **Country** | **Million $** | **%** | **Country** | **Million $** | **%** |
| 1 | Mexico | $774 | 32% | Japan | $1,317 | 38% | Russia | $798 | 21% |
| 2 | Canada | $644 | 27% | Canada | $508 | 15% | Mexico | $531 | 14% |
| 3 | Japan | $292 | 12% | Mexico | $398 | 12% | Canada | $426 | 11% |
| 4 | South Korea | $201 | 8% | South Korea | $225 | 7% | China | $395 | 11% |
| 5 | Taiwan | $117 | 5% | Russia | $247 | 7% | EU-27 | $131 | 4% |
| 6 | Vietnam | $77 | 3% | China | $176 | 5% | Ukraine | $138 | 4% |
| 7 | EU-27 | $74 | 3% | Hong Kong | $160 | 5% | Cuba | $109 | 3% |
| 8 | Hong Kong | $38 | 2% | EU-27 | $95 | 3% | Hong Kong | $74 | 2% |
| 9 | Russia | $28 | 1% | Australia | $80 | 2% | Taiwan | $73 | 2% |
| 10 | Dominican Rep. | $18 | 1% | Taiwan | $28 | 1% | Turkey | $61 | 2% |
| 11 | U.A.E. | $17 | 1% | Philippines | $30 | 1% | Angola | $90 | 2% |
| 12 | Philippines | $14 | 1% | Honduras | $21 | 1% | Guatemala | $59 | 2% |
| 13 | Bahamas | $13 | 1% | Guatemala | $12 | 0% | South Korea | $52 | 1% |
| 14 | Saudi Arabia | $11 | 0% | New Zealand | $12 | 0% | Georgia | $41 | 1% |
| 15 | Jamaica | $9 | 0% | Cuba | $9 | 0% | Japan | $40 | 1% |
| | Other | $87 | 4% | Other | $118 | 3% | Other | $717 | 19% |
| | **U.S. Total** | **$2,413** | **100%** | **U.S. Total** | **$3,435** | **100%** | **U.S. Total** | **$3,734** | **100%** |

**Source:** USDA, ERS, FATUS Export Aggregations.

# What Is Animal ID?

Animal identification (ID) refers to keeping records on individual farm animals or groups (e.g., flocks or herds) of farm animals so that they can be more easily tracked from their birth through the marketing chain. Historically, animal ID was intended to indicate ownership and prevent thievery. Today, animal identification has been expanded to include information on the animal's origins (e.g., birthplace, parentage, sex, breed, genetics) as well as traceability—the ability to trace an animal product back through the marketing chain to its source, while identifying those other animals or animal products with which it has come into contact.

In essence, a national database of animal ID combined with traceability, accessible via a high-speed computer network, is considered the ideal system to permit quick response to news of an animal disease outbreak or the discovery of tainted food so as to limit threats to human or animal health and to minimize commercial damage. Versions of animal ID systems currently exist in several countries, with differences based primarily on the amount and type of information collected and the extensiveness of the traceability system.

## Data Requirements

At a minimum, information is collected and stored concerning the animal's place and date of birth, the name and address of the owner, the date and location of movements between the animal's origin and its place of slaughter, and the date and location of slaughter. More elaborate animal ID systems include information on the sex, breed, and parentage of an animal, the names of all feeds and pharmaceuticals used in raising the animal, and the movement of specific animal products from the processing plant to the retail consumer.

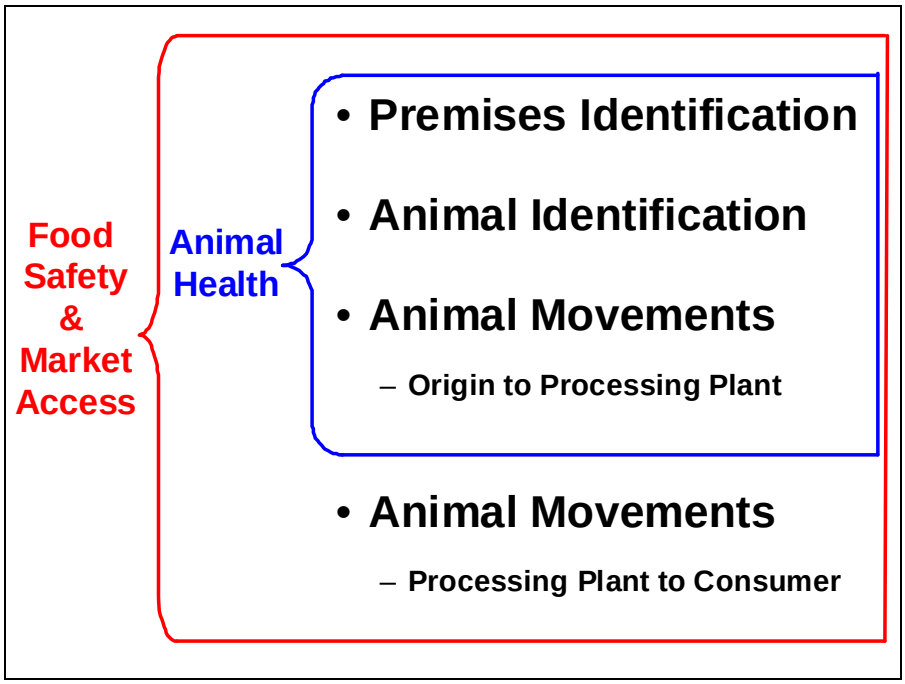
## Objectives

The reasons for identifying and tracking animals and their products have evolved and include rapid response to animal health and/or food safety concerns, as well as verification of recognized premium commercial production processes as specified on qualifying product labels.

In the United States, the current focus of animal ID is animal health. As such, traceability is limited specifically to movements from the animal's point of birth to its slaughter and processing location. In other countries such as the European Union (EU), Japan, and South Korea, the focus of animal ID is both animal health and food safety (**Figure 1**). As a result, those countries have more comprehensive traceability systems that extend beyond the processing plant and follow animal products (marked with an animal-specific bar code) to the retail consumer.

Increasingly, international buyers of U.S. animal products are demanding better information on those products' history—for example, where and how the animals were raised, how the products were prepared, and what is the nature of the marketing chain the products followed to reach their consumer markets. Traceability responds, in part, to these demands.

**Figure 1. Animal ID Goals Expand With Level of Traceability**




**Source:** Assembled by CRS.

# Pros and Cons of an Animal ID System

As a national animal ID and traceability system has evolved in the United States, so too have its proponents and critics. This section briefly highlights the potential benefits of a national animal ID and traceability system as cited by its proponents, and the criticisms that have been raised by program opponents.

## Proponents' Claimed Benefits[5]

Proponents argue that an animal ID and traceability system:

1. **Enhances animal health surveillance and disease eradication.**

According to USDA, animal ID would facilitate early detection of dangerous and costly animal disease outbreaks, while a traceability system would help to identify the source as well as those animal populations that were exposed to the disease, and to contain them via zoning or compartmentalization. Together, USDA claims that a national animal ID and traceability program would likely reduce animal producers' disease testing costs by controlling and/or eradicating animal diseases at both regional and national levels.

[5] The list of proposed benefits is taken from *Overview Report of the Benefit-Cost Analysis of the National Animal Identification System*, Animal and Plant Health Inspection Service (APHIS), USDA, April 2009, pp. 7-13.

2. **Minimizes economic impact of an animal disease outbreak.**

Regionalization or compartmentalization is a disease management tool that contains a disease outbreak to a specific zone, while leaving the remaining areas outside of that zone free of the particular disease and not at risk for international trade restrictions. Rapid identification and compartmentalization of a disease outbreak limits both the spread of commercially harmful diseases and, thereby, the number of animals that would otherwise have to be destroyed or removed from marketing channels. Compartmentalization also facilitates re-establishing international market access and the reopening of lost export markets. The more rapid the response to a disease outbreak, the more limited the economic damage.

3. **Increases domestic marketing opportunities.**

Many farmers and ranchers already keep track of individual animals and how they are being raised, in order to identify and exploit desirable production characteristics—such as "organic" or "grass-fed" or "hormone-free"—that can command substantial price premiums in certain retail markets. Universal bar codes on processed food, including many meats, are widely used by processors and retailers to manage inventories, add value to products, and monitor consumer buying. When consumers seek meat, eggs, or milk from animals raised according to specified organic, humane treatment, or environmental standards, ID and traceability can help firms verify production methods.

Government-coordinated programs also have been established for these purposes. For example, a process verification program operated by USDA's Agricultural Marketing Service (AMS) "provides livestock and meat producers an opportunity to assure customers of their ability to provide consistent quality products by having their written manufacturing processes confirmed through independent, third party audits," according to AMS. USDA "Process Verified" suppliers can have marketing claims such as breeds and feeding practices, and so label them, under this voluntary, fee-for-service program.

Other programs employing varying levels and types of traceability include the domestic origin requirement for USDA-purchased commodities used in domestic feeding programs; the national organic certification program, which AMS also oversees; and the mandatory country-of-origin labeling (COOL) program.

4. **Provides a valuable management tool for producers.**

A traceability program that follows animal products to consumers would provide post-mortem information on cattle with respect to success of various production techniques (e.g., feed types, feed-pasture ratios, or genetics). Similarly, an ID system would be ideally suited for tracking the performance history, along with other relevant criteria, of racing or show animals. It would also increase transparency in the supply chain from producers to consumers; thereby reducing the risk of unfounded liability claims against livestock producers. Finally, an animal ID and traceability program would help producers maintain records on animal movements and health, breed registries, and other marketing activities.

5. **Addresses food safety and national security concerns.**

Federal and state food safety agencies collaborate with APHIS to protect the food supply from the introduction, through animals, of threats to human health, such as tuberculosis, and foodborne

illnesses from bacteria like *Salmonella* and *E. coli* O157:H7.[6] Generally, when local health officials can link an illness to a particular product, firms and their regulators have been able to trace that product back to the processor and/or slaughter facility. It has been more difficult to determine which particular animals, herds, or flocks were involved. Some believe that a more rigorous traceback and animal ID system would facilitate food recalls, possibly contain the spread of a foodborne illness, and help authorities stem future incidents.[7] Others, particularly many within the food industry, strongly disagree, countering that such a system would not be based on sound science, and would be technically unworkable and costly.

6. **Enhances foreign marketing opportunities for animal products.**

In the global marketplace, animal disease programs, aided by traceability systems, are used both to reassure buyers about the health of U.S. animals and to satisfy foreign veterinary and/or food safety requirements. In addition, they assist in assuring credible attributes of animal products with consumers, thus improving opportunities for capturing value-added niche markets by certifying production processes—that is, for export programs that ensure certain aspects of the animal production process such as hormone- or antibiotic-free production.

After BSE appeared in North America in 2003, USDA's AMS developed an export verification (EV) program for U.S. plants seeking to meet the differing beef import specifications of various countries like Japan, a key foreign market for U.S. beef (**Table 2**). AMS establishes the standards that U.S. suppliers must follow if they want to ship beef to these countries, and certifies that the proper procedures are in place. While EV is "voluntary," it also has become a prerequisite for access to the Japanese, Korean, and other foreign markets.

USDA contends that establishing an internationally recognized system of traceability is likely to enhance the competitiveness of U.S. exports of animals and animal products. In fact, the lack of a standardized, national animal identification system was one factor that prevented the United States from receiving "negligible risk" status (the best status possible under the rating system) for BSE from the World Organization for Animal Health (OIE). Receiving negligible risk status would likely enhance the United States' ability to compete internationally, but USDA contends that it would also support U.S. domestic price structures, so that all producers—regardless of their interest in international marketing—would benefit when the United States expands its export markets.

7. **Enhances animal welfare in response to natural disasters.**

In the event of a national disaster, such as a hurricane or major flood, an animal ID system could be used to locate and rescue at-risk animal populations.

## Opponents' Claimed Criticisms

Opponents argue that an animal ID and traceability system:

[6] For more information see CRS Report RL32521, *Agroterrorism: Threats and Preparedness*, by Jim Monke.

[7] Traceability requirements related to food safety likely would be within the purview of USDA's Food Safety and Inspection Service (FSIS), which regulates meat and poultry products under, respectively, the Federal Meat Inspection Act (21 U.S.C. 601 *et seq.*) and the Poultry Products Inspection Act (21 U.S.C. 451 *et seq.*). See also CRS Report RL32922, *Meat and Poultry Inspection: Background and Selected Issues*; and CRS Report RS22955, *Country-of-Origin Labeling for Foods.*

1. **Constitutes an invasion of privacy.**

One of the primary concerns cited by opponents or critics of a national animal ID program is that the collection of personal identification information and production methods represents a government invasion of privacy and could potentially result in the public disclosure of proprietary information. These critics claim that personal data held by government authorities is not secure and may ultimately be released to the broader public.

2. **Increases costs and technical complexity.**

Other critics cite the likelihood of increased producer-level costs of implementation with no guarantee of any market benefit. This concern was at least partially born out by a USDA-funded benefit-cost analysis of animal ID implementation in the United States (discussed in detail in a later section of this report) which found that over 90% of the annual cost of such a program would fall upon the cattle sector.[8]

In addition, the as-yet-unknown technology requirements (e.g., computer hardware/software, record keeping, radio frequency recording, etc.) could potentially increase the complexity of operations and could easily exceed an operator's capability.

3. **Rewards vertical integration at the expense of family farms.**

Studies have shown that the cattle industry is expected to bear the brunt of the costs of implementing a national ID program, in large part because each individual animal will have to be tagged, unlike in the large, vertically integrated pork and poultry industries, where animals are usually raised and moved in lots. Critics claim that this added cost factor would unfairly disadvantage cattle producers in domestic and international meat markets. For small operators who are unable to spread such new costs over large operations, ID costs would likely erode an already thin profit margin.

4. **Disadvantages family farms with a lack of market power in price structure.**

It has also been argued that, as more tracing requirements are imposed, large retailers and meat packers will exercise market power to shift compliance costs backward to farms and ranches, making it even more difficult for the smaller, independent ones to remain in business.

5. **Is objectionable on religious grounds.**

Certain religious groups claim that a government program marking individual animals is an apocalyptic sign of the world's end and should therefore be avoided.

6. **Other potential reasons for producer push-back.**

Although the issue is unstated, some producers are likely concerned that greater transparency at the farm level as a result of more thorough counting and reporting of livestock numbers and sales may increase both income and property tax liabilities, particularly for those producers who previously provided less than full disclosure of animal numbers and farm operations.

[8] NAIS Benefit-Cost Research Team, APHIS, USDA, *Benefit-Cost Analysis of The National Animal Identification System*, January 14, 2009; available at the APHIS, NAIS website at http://animalid.aphis.usda.gov/nais.

# Development of a National Animal ID System

At the national level, an animal ID and traceability program has emerged and evolved over the years from various state and national animal disease eradication and pest control programs.[9] For example, USDA's Animal and Plant Health Inspection Service (APHIS)—the federal agency that oversees animal health in consultation with state veterinary authorities—directs several programs for animal disease eradication and control that include animal identification components effectively requiring ID and tracking.[10] As part of a brucellosis eradication program, uniquely numbered brucellosis ID tags were routinely attached to animals, noting that they had been vaccinated or tested.[11] The program was successful, and brucellosis has largely been eradicated from U.S. commercial herds; as a result, animal ID became less common as the program wound down.

In addition to ID requirements under selected APHIS programs, certain classes of livestock must be officially identified before entering interstate commerce. For example, the official disease programs for pseudorabies in swine and scrapie in sheep require that both of these species be officially identified before entering interstate commerce.[12] Often state laws or breed association rules require animals of these and other species, like cattle and horses, to be identified to participate in shows or races. But these various programs are not national in scope and vary in their manner of animal identification, record keeping, and data management.

U.S. animal ID limitations were noted after bovine spongiform encephalopathy (BSE, or mad cow disease) was discovered in the United States (in a Canadian-born dairy cow) in December 2003. A number of trading partners that had quickly closed their borders to U.S. beef reportedly were reluctant to reopen them, due in part to U.S. difficulties in tracing the whereabouts of other cattle that had entered the United States with the BSE-infected cow; similar difficulties arose in determining the whereabouts and/or herd mates of the two later U.S.-born BSE cases.[13]

Today's national animal identification system (NAIS) program has attempted to build on and learn from these earlier programs, and although it is administered by USDA's APHIS, NAIS is based on a state-federal-industry partnership that provides the opportunity for producers who are not part of a disease program to voluntarily participate in national animal health safeguarding efforts. Certain states already have mandated some components of animal identification such as premises registration; however, at the federal level, NAIS is a voluntary program.[14]

[9] See **Appendix A** for a brief outline of the historical development of animal ID and traceability in the United States.

[10] For more information, see the APHIS website at http://www.aphis.usda.gov/.

[11] Brucellosis is a highly contagious and costly disease mainly affecting cattle, bison, and swine (once common in the United States).

[12] Pseudorabies is a viral disease most prevalent in swine, often causing newborn piglets to die. Scrapie is a fatal, degenerative disease affecting the central nervous system of sheep and goats. For more information, refer to the "Animal Diseases" website of APHIS, USDA at http://www.aphis.usda.gov/animal_health/animal_diseases/.

[13] See CRS Report RL32199, *Bovine Spongiform Encephalopathy (BSE, or "Mad Cow Disease"): Current and Proposed Safeguards*, by Sarah A. Lister and Geoffrey S. Becker.

[14] For example, Michigan (http://www.michigan.gov/mda/0,1607,7-125-48096_48149—,00.html), Indiana (http://www.in.gov/boah/2328.htm), and Wisconsin (http://www.datcp.state.wi.us/premises/index.jsp).

## Species Coverage

NAIS is intended to cover all major commercial livestock and poultry species raised in the United States, including beef and dairy cattle, hogs, sheep, goats, chickens, and turkeys, as well as large animal species raised and kept for sports and/or recreation, most notably horses. This is a new development in the United States, as there has never been a nationwide animal ID system for all animals of any given species.

Household pets are excluded from NAIS. Only animals that enter commerce or that commingle with animals at other premises (like sales barns, state or national fairs, or exhibits) are identified. Also, animals that typically are moved in groups—such as hogs and poultry—could be identified as part of their group rather than individually.

## USDA's Involvement

Because NAIS is voluntary, and because much of its implementation occurs at the local and state levels, USDA's involvement has been focused on popularizing the program, ensuring that adequate information is available to all participants (both actual and potential), and addressing the following general issues:

- prioritize implementation by species/sectors, taking into account where the greatest disease concerns and traceability opportunities exist;
- harmonize animal ID programs;
- standardize data elements of disease programs to ensure compatibility;
- integrate automated data capture technology with disease programs;
- partner with states, tribes, and territories;
- collaborate with industry; and
- advance ID technologies.

To ensure that NAIS participants and other interested stakeholders have access to pertinent information about the program, USDA has published a series of reports that provide participant guidance, technical standards, and implementation strategies. Three reports in particular (described below) provide detailed information about the current status of NAIS, how to participate in the program, including the necessary technical details, and the future direction of program implementation.[15]

### NAIS Business Plan[16]

*A Business Plan to Advance Animal Disease Traceability* details recommended strategies and actions to enable existing state and federal regulated and voluntary animal health programs, industry-administered animal health and marketing programs, and various animal identification techniques to work in harmony to enhance animal disease traceability.

[15] All three reports are available on the NAIS website at http://animalid.aphis.usda.gov/nais.

[16] *A Business Plan to Advance Animal Disease Traceability*, Version 1.0, APHIS, USDA, September 2008.

### NAIS User Guide[17]

The NAIS *User Guide*, first published in November 2006, provides guidance to producers and owners of animals, as well as other sectors involved in the animal agricultural industry, on how to participate in NAIS and how participation will benefit them.

### NAIS Program Standards and Technical Reference[18]

As a supplement to the *User Guide*, the *Program Standards and Technical Reference* document establishes data standards for NAIS, including:

- the data element formats for premises identification numbers, animal identification numbers, and group/lot identification numbers, which are needed to ensure compatibility across information systems;
- standards for official identification devices that utilize the animal identification number; and
- information on technology standards published by the International Organization for Standardization (ISO) that are utilized in NAIS.

Use of these standards by states, tribes, industry organizations, identification device manufacturers, and other entities involved in NAIS helps to ensure that the system is effective.

## NAIS Goals

The primary goal of NAIS is to protect the commercial interests involved in U.S. agriculture from the potential harm associated with the outbreak of an animal disease. NAIS is not intended to serve as a food safety program per se, although there may be positive public safety effects from the successful implementation of NAIS.

USDA identifies the following specific goals of NAIS:[19]

- Increase the United States' disease response capabilities.
- Limit the spread of animal diseases.
- Minimize animal losses and economic impact.
- Protect the livelihoods of animal producers.
- Maintain market access.

To accomplish these goals, USDA's long-term goal is to achieve the ability to identify and trace animals of interest within 48 hours of an animal disease problem. To meet this time frame, animal health officials must have rapid access to reliable and complete data on both animal ID and movement history.

---

[17] *National Animal Identification System (NAIS)—A User Guide and Additional Information Resource*, Version 2.0, APHIS, USDA, December 2007; hereafter referred to as *NAIS User Guide (2007)*.

[18] *NAIS Program Standards and Technical Reference*, Version 2.2, APHIS, USDA, February 2008.

[19] This list is available at http://animalid.aphis.usda.gov/nais/about/nais_components.shtml.

## Current NAIS Program

When a disease outbreak occurs, animal health officials need three key pieces of information in order to contain the outbreak and limit its commercial damage.

- Which animals are involved in a disease outbreak?
- Where are the infected animals currently located?
- What other animals might have been exposed to the disease?

NAIS is designed to meet these three data needs so as to facilitate quick traceback from the point of discovery of an animal disease at any point in its commercial marketing chain back to its original premises, while noting all other animals that came into contact with the diseased animal. To collect the requisite information, NAIS is composed of three sequential components—premises registration, animal identification, and animal tracking.

### Step 1. Premises Registration[20]

The first phase of NAIS involves registering the geographic location (i.e., the farm or ranch) where the livestock or poultry are raised, housed, or boarded. To meet USDA's data standards for premises registration, states and tribes collect and maintain "at a minimum" the following pieces of information:[21]

- premises identification number (PIN);
- name of entity;
- contact person for premises;
- mailing address or latitude/longitude coordinates of the premises;
- contact phone number;
- operation type;
- date activated, date retired, and the reason retired (to determine whether animals still exist at the location); and
- alternative phone numbers.

The PIN is a unique seven-digit number that is permanently assigned to a location. The PIN does not change following a change of ownership. It is possible for a producer or owner to have multiple PINs based on the nature and type of operations (e.g., if a single producer has distinctly different animal production activities taking place at different locations).

Premises are registered at one of the state (or tribal) animal health authorities. Premises registration is free and does not require participation in the following two steps. USDA maintains

[20] For more information on premises registration, see http://animalid.aphis.usda.gov/nais/premises_id/index.shtml.

[21] *NAIS User Guide (2007)*, p. 17.

the premises information in a National Premises Information Repository, but declares that it will protect individuals' private information and confidential business information from disclosure.[22]

According to USDA, premises information ensures that producers will be notified quickly when a disease outbreak or other animal health event might harm their operations. In an emergency, animal health officials will be able to quickly locate at-risk animals and take precise actions to address the situation, minimize hardships, and speed disease eradication efforts as much as possible.

In late 2006, the goal was to have all premises registered by 2009. However, as of September 6, 2009, only about 37% of premises (excluding horses) were registered under the NAIS out of an estimated 1.4 million U.S. animal and poultry operations (**Table 3**). USDA has stated that much higher levels of participation are needed to successfully implement NAIS.

[22] Ibid., p. 18.

**Table 3. NAIS Premises Registration Statistics, as of September 6, 2009**

| State | Premises | Premises Registered | Percent |
|---|---|---|---|
| Massachusetts | 3,555 | 8,082 | >100.0% |
| Wisconsin | 51,373 | 62,802 | >100.0% |
| Indiana | 34,790 | 35,200 | >100.0% |
| Idaho | 18,754 | 18,752 | 100.0% |
| New York | 25,559 | 22,441 | 87.8% |
| Utah | 12,460 | 10,184 | 81.7% |
| Michigan | 29,011 | 22,447 | 77.4% |
| Pennsylvania | 42,302 | 30,749 | 72.7% |
| North Dakota | 14,085 | 8,904 | 63.2% |
| Nevada | 2,522 | 1,485 | 58.9% |
| Nebraska | 30,841 | 17,606 | 57.1% |
| Iowa | 47,273 | 26,741 | 56.6% |
| West Virginia | 17,670 | 9,509 | 53.8% |
| Illinois | 30,046 | 15,094 | 50.2% |
| Delaware | 1,553 | 661 | 42.6% |
| Colorado | 22,951 | 8,650 | 37.7% |
| North Carolina | 36,142 | 13,491 | 37.3% |
| Minnesota | 44,193 | 15,593 | 35.3% |
| Alaska | 354 | 117 | 33.1% |
| South Carolina | 16,120 | 4,976 | 30.9% |
| Tennessee | 68,010 | 20,577 | 30.3% |
| Hawaii | 1,391 | 406 | 29.2% |
| Virginia | 37,673 | 10,619 | 28.2% |
| New Mexico | 11,250 | 3,102 | 27.6% |
| Arizona | 5,170 | 1,425 | 27.6% |
| Florida | 28,731 | 7,826 | 27.2% |
| Alabama | 35,538 | 9,284 | 26.1% |
| Kentucky | 61,251 | 15,565 | 25.4% |
| Arkansas | 37,614 | 9,501 | 25.3% |
| South Dakota | 22,356 | 5,549 | 24.8% |
| California | 32,500 | 7,763 | 23.9% |
| Mississippi | 29,312 | 6,751 | 23.0% |
| Wyoming | 8,227 | 1,840 | 22.4% |
| Kansas | 39,346 | 8,430 | 21.4% |
| Ohio | 48,073 | 9,995 | 20.8% |
| Maryland | 7,837 | 1,559 | 19.9% |
| New Jersey | 5,315 | 1,041 | 19.6% |
| Missouri | 79,018 | 15,166 | 19.2% |
| Texas | 187,118 | 33,022 | 17.6% |
| Oklahoma | 71,420 | 12,184 | 17.1% |
| Louisiana | 19,677 | 3,307 | 16.8% |
| Georgia | 35,431 | 5,108 | 14.4% |
| Maine | 4,213 | 444 | 10.5% |
| Oregon | 28,634 | 2,877 | 10.0% |
| Washington | 22,155 | 2,131 | 9.6% |
| Vermont | 4,438 | 389 | 8.8% |
| Montana | 19,708 | 1,699 | 8.6% |
| Connecticut | 2,539 | 164 | 6.5% |
| Rhode Island | 504 | 15 | 3.0% |
| New Hampshire | 2,277 | 61 | 2.7% |
| **Subtotal** | **1,438,280** | **531,284** | **36.9%** |
| Territories & Tribes | | 1,577 | |
| **Grand Total** | | **532,861** | |

**Source:** NAIS website, APHIS, USDA.

**Note:** Includes cattle, goats, poultry, sheep, and swine; does not include horse premises. In cases where participation exceeds 100%, eligible premises were being undercounted.

## Step 2. Animal Identification[23]

The second phase of NAIS involves assigning each individual animal or each specific group of animals a unique number from a uniform numbering system. A group ID is best suited for animals, such as swine or poultry, that are raised in confined lots and move through the production chain as one group.

### *Animal Identification Number (AIN)*

An animal identification number (AIN) is a unique, 15-digit number, where the first three numbers are the country code and the following 12 digits are the animal's unique identifying number.[24] The first three numbers of an AIN issued in the United States will always be 840. As a result, tags, radio frequency identification devices, and other ID devices that comply with the 15-digit AIN numbering system are often referred to as 840 devices.

Animal ID is accomplished by obtaining USDA-recognized numbering tags or devices from representatives of authorized manufacturers. AIN devices include the traditional visual ear-tag or tattoos that are read by physical viewing, or the radio frequency identification (RFID) tags as well as injectable transponders, which may be read electronically from a moderate distance and without direct line of sight.[25] USDA has not designated any specific identification technologies beyond the minimum requirements for official identification that have been identified in the *Code of Federal Regulations*.

In recent years, the use of RFID devices and injectable transponders with information that is read by scanners and fed into computer databases is becoming more common, because these devices allow for faster, easier access to ID information. Because they can be read electronically, RFID and electronic transponder devices eliminate the need to approach or restrain animals, thereby reducing stress and increasing the quality of the data obtained.

Some animals do not need to be identified under NAIS, specifically animals whose movement poses a low risk of disease spread or exposure. Such cases include animals that never leave their birth premises (e.g., that die and are buried at their birthplace) or are only moved directly to custom slaughter for personal consumption. However, USDA encourages all animal owners to register their premises, regardless of the number of animals present, because many animal diseases (such as avian influenza, foot-and-mouth disease, and vesicular stomatitis) can be spread whether an animal leaves its home premises or not.

The person responsible for the care of the animal chooses when to place the ID on the animal. Some producers may want to attach ID devices shortly after birth; others may choose to attach a device later. However, USDA contends that an animal should have an ID attached before it moves from its current premises to another producer's premises, a livestock market, or a feedlot, among other locations. If the animals cannot be tagged at their current premises, producers might elect to have their animals tagged at an auction market that provides tagging services when they are ready to market their animals. In such cases, when the animals are unloaded, they would be tagged

[23] For more information on animal identification see http://animalid.aphis.usda.gov/nais/animal_id/index.shtml.

[24] *NAIS User Guide (2007)*, p. 22.

[25] APHIS provides more information on AIN devices at http://animalid.aphis.usda.gov/nais/naislibrary/documents/guidelines/NAIS_ID_Tag_Web_Listing.pdf.

before they are commingled with animals from other premises. In some areas, tagging services are available. Producers who purchase animals (whether from a domestic or foreign source) and bring them into their operation are expected to maintain the official identification already on the animal—no additional identification or change of identification of those animals is needed.

### *Group Identification Number (GIN)*

Animals that typically move through the production chain as a group of animals of the same species can be identified by group/lot identification numbers (GINs), rather than individual numbers. This practice is most common in the poultry and pork industries. However, group/lot identification may be an option for other species when they move through the production chain as a group. The GIN is a 15-character number consisting of the seven-character PIN; the six-digit date (MMDDYY) that the group or lot of animals was assembled; and a two-digit number (01 to 99) to reflect the count of groups assembled at the same premises on the same day. Since the GIN is "self-generated" by the producer (not assigned by USDA) the GIN of each group is maintained at the premises by the producer in his or her management records.

The ID remains with the animal for its lifetime. The uniform numbering system links each producer's livestock or poultry flock to the animal's birthplace or premises of origin. The actual identification protocol is sensitive to the unique qualities of different species groups, and the way they are raised, moved, commingled, and processed.

## Step 3. Animal Tracing[26]

The third phase of NAIS involves access to timely, accurate animal movement records in order to quickly locate at-risk animals in the event of a disease outbreak, and to limit the disease to a clearly defined region or compartment. Under this third step, a producer selects one of the NAIS-compliant animal tracking databases (ATDs) maintained by states and private industry (i.e., not the federal government) to which the producer can report the movement of animals that are shipped from or moved into their premises. Under NAIS, only the minimum, standardized tracing information is necessary for participation. The minimum traceback information includes:[27]

- the national premises identification number (PIN);
- the animal ID number (AIN) or group ID number (GIN);
- the date of the event; and
- the event itself (e.g., move-in to a new premises or move-out of the current premises).

Other animal-specific data (e.g., age, species, sex) that support NAIS in traceback situations are also standardized, but are not necessary for participation.

The traceback information is read and recorded each time that a notable movement between locations occurs.[28] Movements within a production unit for management purposes (e.g., from

[26] For more information on animal tracing, see http://animalid.aphis.usda.gov/nais/animal_track/index.shtml.

[27] *NAIS User Guide (2007)*, p. 32.

[28] For specific examples of reportable and non-reportable animal movement scenarios, see *NAIS User Guide (2007)*, (continued...)

pasture to pasture) are not considered to impact disease spread, and therefore are not necessary to report relative to NAIS.

The voluntary animal tracing component of NAIS is a public/private partnership. Both industry—through private systems—and states operate and maintain ATDs, which contain the animal location and movement records that producers report to help safeguard animal health. In other words, the federal government does not maintain the ATDs; states and privates entities do. Having states and industry maintain these ATDs is part of USDA's plan to assure confidentiality for participants. On the federal side, USDA operates a portal system that will enable animal health officials to submit requests for information to the administrators of the ATDs when investigating an animal disease event. This system is known as the Animal Trace Processing System (ATPS).

When there is a disease outbreak or other animal health event, the ATDs are designed to provide timely, accurate reports that show where potentially exposed animals have been and what other animals have come into contact with them. USDA defines retrieval of traceback data within a 48-hour window as optimal for efficient, effective disease containment.

State and federal animal health officials will use the system only in the following situations:[29]

- an indication (suspect, presumptive positive, etc.) or confirmed positive test for a foreign animal disease;
- an animal disease emergency as determined by the Secretary of Agriculture and/or state departments of agriculture; or
- a need to conduct a traceback/traceforward to determine the origin of infection for a program disease (brucellosis, tuberculosis, etc.).

## USDA Listening Sessions

Between April 15 and June 30, 2009, Secretary of Agriculture Tom Vilsack undertook a series of public listening sessions around the country to hear from livestock producers and other interested parties concerning their views of the NAIS.[30] Secretary Vilsack said that he hoped to use the listening sessions to gather feedback and input that will assist him in making decisions about the future direction of animal ID and traceability in the United States.

Since early 2004, USDA has committed nearly $142 million to the development of NAIS, providing many of the funds to states and tribal organizations for research, database systems, and startup of premises registration. It was unclear as of late September 2009 what, if any, changes the Obama Administration would propose in the design or implementation of the program.

(...continued)

pp. 35-36.

[29] Ibid., p. 30.

[30] For more information, see "Agriculture Secretary Vilsack Seeks Dialogue with Producers and Stakeholders on National Animal Identification System," USDA News Release No. 0108.09, April 15, 2009; and the NAIS-APHIS website for a listing of the public listening sessions at http://animalid.aphis.usda.gov/nais/feedback.shtml.

# Pending Issues

## Low Participation Rates; Slow Implementation Pace

As of September 2008, about 40% of potential premises in the United States had been registered (**Table 4**), although there is substantial variation in participation across species and states (**Table 3**). Poultry and sheep registration is estimated at 95%, swine at 80%, goat at 60%, horse at 50%, and cattle at 18%.

On September 6, 2009, APHIS reported that 531,284 animal premises (excluding horses) had been registered in one of the available databases (**Table 3**).[31] This represents 36.9% of the estimated 1.4 million livestock and poultry farms (with animal product sales of at least $1,000) in the United States.[32]

**Table 4. Estimated U.S. Animal Premises, Populations, and Premises Registration Participation Rates by Species**

| Species | Estimated Animal Population | Estimated Number of Premises | Percent of Premises Registered |
|---|---|---|---|
| Poultry[a] | 1,911,625,000 | 162,800 | 95% |
| Sheep[b] | 5,747,000 | 69,000 | 95% |
| Swine | 67,218,000 | 65,540 | 80% |
| Goat | 3,070,000 | 91,000 | 60% |
| Cattle[c] | 94,491,000 | 1,046,000 | 18% |
| Subtotal | 2,082,151,000 | 1,438,280 | 36% |
| Horse | 5,800,000 | 570,000 | 50% |
| Total | 2,087,951,000 | 2,004,340 | 40% |

**Source:** Estimated total number of premises and total percent registered (excluding horses) is from "Premises Registration Statistics," NAIS website, APHIS, USDA. Estimated number of premises by species (including horses) is from *A Business Plan to Advance Animal Disease Traceability*, APHIS, USDA, Version 1.0, September 2008. Estimated percent of premises registered by species is compiled by CRS from various APHIS documents.

a. Poultry populations are from the *Census of Agriculture*, National Agricultural Statistics Service (NASS), USDA, 2002.

b. Sheep and goat population estimates are from *Sheep and Goats*, NASS, USDA, January 30, 2009.

c. Cattle population estimates from *Cattle*, NASS, USDA, January 30, 2009.

To achieve an effective response to an animal disease outbreak, a certain level of participation is necessary. According to USDA, NAIS must achieve a "critical mass" level of participation to achieve its long-term goal of 48-hour traceback. USDA estimates that 70% of the animals in a

[31] An additional 1,369 premises (not included in the total above) have been registered in U.S. territories and 208 in tribal areas; available at http://animalid.aphis.usda.gov/nais/premises_id/prem_stat_files/NAIS_Prem_Stat_Report.pdf.

[32] The *NAIS Business Plan (2008)* breaks this total into an estimated 1.046 million cattle premises, 66,000 hog premises, 163,000 poultry premises, 69,000 sheep premises, and 91,000 goat premises. In addition, the *Business Plan* estimates there are 570,000 premises for horses in the United States.

specific species and/or sector need to be identified and traceable to their premises of origin to achieve the necessary "critical mass."[33] Dr. John Clifford, USDA's Chief Veterinary Officer for animal health, has also cited a participation rate of 70% of the animals in a specific species—that could be both identified and traceable to their premises of origin—as necessary to provide an effective measure of traceability.[34] However, Dr. Clifford suggests that a much higher participation rate, perhaps as high as 90%, would be necessary to ensure the full benefits of the system.

Some animal ID program supporters have criticized USDA for moving too slowly and/or not setting a clearer path toward universal ID. A July 2007 report by the Government Accountability Office (GAO) concluded that a number of problems had hindered effective implementation of animal ID, such as no prioritization among the nine animal species to be covered to focus on those of greatest disease concern; no plan to integrate NAIS into existing USDA and state animal ID requirements; and no requirement that some types of critical data be provided to the databases, such as species or age.[35] USDA's *NAIS Business Plan (2008)* was intended to respond to several of the GAO criticisms.

Others believe that USDA's progress simply reflects the wide differences among producers and other interests over many unresolved issues.

## Mandatory or Voluntary?

NAIS is presently operated as a voluntary program. However, USDA officials have expressed concern that participation rates are currently too low for NAIS to be effective at achieving its 48-hour traceback window. These officials have publicly called for Congress to address the low participation rates either by increasing the incentives to participate or by making the program mandatory.[36]

Others, including many state animal health officials, have already made similar requests. The American Veterinary Medical Association (AVMA), which represents more than 78,000 veterinarians across the United States, has addressed Congress on its support for mandatory participation in NAIS.[37] At meetings in October 2006, the National Assembly of State Animal Health Officials and the U.S. Animal Health Association's livestock committee each approved a recommendation that, as a step toward a national system, USDA make animal ID mandatory for all U.S. breeding cattle. Consumer advocacy groups also have pressed for a mandatory national system. Among livestock industry groups, the National Pork Producers Council (NPPC),[38] the

[33] *NAIS Business Plan*, Version 1.0, APHIS, USDA, September 2008, p. 11.

[34] Dr. John Clifford, Deputy Administrator for Veterinary Services, APHIS, in testimony given on the National Animal Identification System at a joint hearing for the Committees of Agriculture's Subcommittee on Livestock, Dairy, and Poultry and the House Committee on Homeland Security's Subcommittee on Emerging Threats, Cybersecurity, and Science and Technology on May 5, 2009.

[35] *National Animal Identification System: USDA Needs to Resolve Several Key Implementation Issues to Achieve Rapid and Effective Disease Traceback*, GAO-07-592, July 2007.

[36] Dr. John Clifford, in remarks made during the question and answer session at the May 5, 2009, hearing mentioned in an earlier footnote.

[37] Testimony of Dr. W. Ron DeHaven, DVM, MBA, Chief Executive Officer, AVMA, at a hearing on NAIS by the House Committee on Agriculture's Subcommittee on Livestock, Dairy, and Poultry, March 11, 2009.

[38] See the NPPC website position paper on NAIS at http://www.nppc.org/issues/mais.htm.

National Milk Producers Federation (NMPF),[39] and the American Meat Institute (AMI)[40] have announced their support for a mandatory animal identification system. Both the chairman of the House Committee on Agriculture, Collin Peterson, and the chairwoman of the House Committee on Appropriations' Subcommittee on Agriculture, Rosa DeLauro, have expressed their interest in seeing NAIS implemented as a mandatory program as a way to avoid devastating losses from virulent diseases.

In contrast, groups opposed to a mandatory NAIS are primarily associated with the cattle industry, including the Rancher's-Cattlemen Action Legal Fund (R-CALF),[41] the National Cattlemen's Beef Association (NCBA),[42] and the Farm-to-Consumer Legal Defense Fund.[43] Some opponents reportedly have been working to block mandatory and/or even voluntary programs in various states.[44] The cattle groups fear that high costs for equipment to carry out the system will favor continued concentration in the industry to the disadvantage of small, independent producers, and they question whether USDA can keep the information confidential. Several members of Congress from districts and states with large cattle industries have echoed the cattle industry's concerns.[45]

There is some uncertainty over the degree of authority that a U.S. Secretary of Agriculture has in determining by decree whether NAIS will be a voluntary or mandatory program. However, in August 2006, then-Secretary of Agriculture Mike Johanns responded to the growing concerns of the cattle industry by announcing that USDA would continue to implement NAIS as a voluntary program. Proponents of a mandatory NAIS program now argue that, with a change in administration, Secretary Vilsack should have the same authority to reverse Secretary Johanns's earlier determination and announce that participation in NAIS would be mandatory for the U.S. livestock industry.

## Costs and Who Pays

An animal ID system will impose a variety of costs, such as for tags or other identifying devices and their application, and data systems to track animals. As the extent of traceability increases, so do likely costs. Cost estimates of a national system have varied broadly, and are not directly comparable, a reflection of estimators' differing assumptions and of the varying designs of proposed programs. A related policy question is who should pay—the industry (and ultimately consumers), government, or both? USDA's current thinking calls for expenses to be shared (e.g., database costs funded by government and the identifying devices by producers).

[39] Testimony of Dr. Karen Jordan, D.V.M., on behalf of NMPF, at a hearing on NAIS by the House Committee on Agriculture's Subcommittee on Livestock, Dairy, and Poultry, March 11, 2009.

[40] http://www.meatami.com/ht/d/ArticleDetails/i/3252.

[41] http://www.r-calfusa.com/animal_id/animal_id.htm.

[42] http://www.beefusa.org/uDocs/animalidleavebehind.pdf.

[43] http://www.ftcldf.org/aa/aa-13feb2009-2.htm.

[44] The Farm-to-Consumer Legal Defense Fund, in particular, has taken an active role in blocking any forward momentum in national animal identification. For example, see http://www.ftcldf.org/aa/aa-13feb2009-2.htm.

[45] For examples, see "McCaskill Helps Struggling Independent Producers in Missouri: Measures will increase dairy prices and protect against mandatory national animal identification program," Senator McCaskill press release, August 5, 2009; and "Johnson Shares Concerns of South Dakotans with Ag Secretary," Senator Johnson press release, March 19, 2009.

It has been argued that, as more tracing requirements are imposed, large retailers and meat packers will exercise market power to shift compliance costs backward to farms and ranches, making it even more difficult for the smaller, independent ones to remain in business. Larger, more vertically integrated operations are more likely to have the resources and scale economies to survive, some have argued. On the other hand, if traceability costs forced big meat plants to reduce line speeds, "smaller plants with slower fabrication speeds may be better equipped to implement traceability to the retail level and may find niche market opportunities."[46]

On April 29, 2009, APHIS released a study, the *KSU Benefit-Cost Study (2009)*, of the economic benefits and costs of adopting USDA's NAIS.[47] The research was conducted by economists at Kansas State University in collaboration with researchers from Colorado State University, Michigan State University, and Montana State University. The report represents the researchers' best estimate of what they anticipate would result from the adoption of NAIS across multiple species and at varying participation rates. Key study assumptions concerning individual versus group ID tagging included the following: all cattle are individually ID tagged; all swine are group ID tagged, except for cull breeding animals, which require individual ID tagging; and all poultry are uniquely group ID tagged. The results for a 100%-participation scenario are summarized in **Table 5**.

## Estimated Costs

The *KSU Benefit-Cost Study (2009)* showed that annual estimated costs for implementing NAIS throughout the livestock (i.e., food animal) industries would be approximately $228 million (at 2009 prices) for full pre-harvest traceability with 100% participation (**Table 5**). The cost expands to $304.2 million when horses are included. The cost estimates are less for lower levels of participation and for more limited traceability features. Over 90% of the food animal industry costs for such a system would be associated with the cattle sector, which equates to $5.97 per animal marketed. This is largely due to the individual animal ID required, whereas swine, sheep, goats, and poultry can often be sufficiently traced using premises and group lot information.

Identification tags and tagging cattle accounted for 75% of the cattle sector's annual adoption costs. The estimated tag and tagging costs varied among cattle producers from $3.30 to $5.22 per animal, depending on current identification practices. In comparison to the cattle industry's $5.97 average cost per marketed animal, the average per animal cost for other livestock sectors was $0.059 per swine, $1.39 per sheep, $0.0007 per broiler, $0.002 per turkey, and $0.0195 per layer.

[46] "Meat Traceability: Its Effect on Trade," *Iowa Ag Review*, Winter 2002.

[47] The study, hereafter referred to as the *KSU Cost-Benefit Study (2009)*, is available at the APHIS, NAIS, website at http://animalid.aphis.usda.gov/nais.

**Table 5. Estimated Annual Cost Summary of NAIS Implementation by Species**

(scenario assumes 100% participation)

| Species | Premises Registration | Tags & Tagging | Reading / Tracking | Total Cost | Adoption Cost per Animal | Total Cost per Animal Marketed |
|---|---|---|---|---|---|---|
| | $1,000 | | | | $ per head | |
| **Cattle** | **4,474** | **157,326** | **47,270** | **209,070** | **4.97** | **5.97** |
| Beef Cow/Calf | 3,516 | 126,277 | 9,971 | 139,764 | 4.22 | 4.91 |
| Dairy | 318 | 22,288 | 8,832 | 31,438 | 3.43 | 6.21 |
| Backgrounder | 236 | 3,722 | 8,115 | 12,073 | 0.71 | 0.71 |
| Feedlot | 404 | 5,038 | 8,120 | 13,563 | 0.51 | 0.51 |
| Auction Yard | - | - | 8,765 | 8,765 | 0.23 | 0.23 |
| Packing Plant | - | - | 3,467 | 3,467 | 0.10 | 0.10 |
| **Swine** | **304** | **1,437** | **4,680** | **6,422** | **0.06** | **0.06** |
| Farrow-to-Wean | 28 | 616 | 905 | 1,549 | 0.03 | 0.02 |
| Farrow-to-Feeder | 20 | 296 | 520 | 836 | 0.03 | 0.03 |
| Farrow-to-Finish | 95 | 525 | 1,871 | 2,492 | 0.13 | 0.12 |
| Wean-to-Feeder | 24 | - | 382 | 407 | 0.01 | 0.01 |
| Feeder-to-Finish | 138 | - | 854 | 991 | 0.01 | 0.01 |
| Packers | - | - | 147 | 147 | 0.00 | 0.00 |
| **Sheep** | **327** | **2,091** | **1,246** | **3,664** | **1.07** | **1.39** |
| All operations | 327 | 2,091 | 1,214 | 3,632 | 1.06 | 1.06 |
| Packers | - | - | 32 | 32 | 0.01 | 0.01 |
| **Poultry** | **644** | **-** | **8,469** | **9,113** | **0.001** | **0.001** |
| Layers | 456 | - | 2,036 | 2,492 | 0.020 | 0.020 |
| Broilers | 148 | - | 5,911 | 6,060 | 0.001 | 0.001 |
| Turkeys | 39 | - | 521 | 560 | 0.002 | 0.002 |
| **Subtotal** | **5,750** | **160,854** | **61,666** | **228,269** | | |
| **Equine** | **2,690** | **34,524** | **38,682** | **75,896** | **13.09** | **na** |
| **Total** | **8,440** | **195,378** | **100,348** | **304,166** | | |

**Source:** "Benefit-Cost Analysis of The National Animal Identification System," NAIS Benefit-Cost Research Team, January 14, 2009; hereafter referred to as the *KSU Benefit-Cost Study (2009)*, available at http://animalid.aphis.usda.gov/nais/naislibrary/documents/plans_reports/Benefit_Cost_Analysis_NAIS.pdf

**Notes:** Some of the per animal costs were derived by CRS from available data. na = not available.

### Estimated Benefits

The study also found that the economic benefits from NAIS with 100% participation easily exceeded the costs. Benefits included:

- substantial federal and state government savings in connection with administration of animal disease control and eradication programs due to the reduction in disease outbreaks;
- economic benefits from quickly re-establishing markets following a disease outbreak, plus possible expanded market access in the international marketplace;
- avoidance of significant losses—as great as $1.32 billion per year over a 10-year period—due mostly to lost export market access; and
- increased consumer demand resulting from higher confidence in food products.

By evaluating the cost-benefit effects over a range of participation levels, the study found that implementation of NAIS becomes more cost-effective as participation levels increase, and that NAIS may not be economically viable at lower participation levels.

## Liability and Confidentiality of Records

Some producers are concerned that they will be held liable for contamination or other problems over which they believe they have little control after the animal leaves the farm. On the other hand, documentation of management practices, including animal health programs, can help to protect against liability because it can prove where animals originated and how they were raised. Also at issue is whether producers can and should be protected from public scrutiny of their records. The federal Freedom of Information Act (FOIA) entitles members of the public to obtain records held by federal agencies. Some producers are concerned, for example, that animal rights extremists might misuse information gained through FOIA, or that the data collection might reveal proprietary information. However, FOIA exempts access to certain types of business information, such as trade secrets, commercial or financial information, or other confidential material that might harm the provider.[48]

In the 110th Congress, conferees deleted a provision (Sec. 10305) in the Senate-passed version of H.R. 2419, the omnibus 2008 farm bill enacted as P.L. 110-246, that would have required USDA regulations addressing "the protection of trade secrets and other proprietary and/or confidential business information" disclosed due to participation in an animal ID system.

## International Traceability Requirements for Meat Imports

A South Korean agriculture official recently reported that his government intends to impose traceability requirements on imported beef as soon as December 2010.[49] Currently the EU requires individual identification and traceability for all suppliers, domestic and foreign.[50]

[48] For more discussion of liability and confidentiality issues, see National Agricultural Law Center, *Animal Identification—An Overview*, at http://www.nationalaglawcenter.org/readingrooms/animalid/.

[49] Brett Stuart, "S.Korea Traceability Requirement," *CattleFax Update*, vol. 41, issue 28, July 10, 2009, p. 4.

Presently, Japan does not specifically require traceability for imported beef, although imported beef is subject to several other specifications including a 20-month age limitation. The opposition Democratic Party of Japan (DPJ) has declared that, if elected, it will work toward early passage of both an existing "BSE Measures Law" and a "Beef Traceability Law" in order to subject imported beef to the same traceability requirements as domestic beef.[51] On August 30, 2009, the DPJ won 308 seats in the Japanese Diet. The DPJ hopes to forge a coalition with two minor parties that would give it a two-thirds majority, enabling it to force through legislation.[52] However, as the DPJ is involved with setting up its new administration and prioritizing its agenda, it is unlikely that the issue of a traceability requirement on imported meat will be addressed as an early priority.

The only top tier beef exporter in the world besides the United States without a traceability system is India, which exports very low-valued canned/cooked beef. According to *CattleFax* analyst Brett Stuart, "While few U.S. producers are willing, or expected, to implement a system voluntarily with little direct benefit, we may be rapidly approaching a future where beef traceability is the price of admission into the global beef world."[53]

The WTO's Agreement on the Application of Sanitary and Phytosanitary Measures applies rules to the use of non-tariff trade barriers (e.g., traceability and identification requirements) to restrict market access. The implementation of traceability measures applied to imports must meet two requirements.[54] First, any traceability requirements must be scientifically justified based on an assessment of risk to human, animal, or plant health. Second, they may be equivalent to, but not more rigorous than, the standards applied to domestic industry.[55]

# Congressional Actions

## Funding

From FY2004 through FY2009, approximately $142 million has been appropriated for NAIS, including $14.5 million in FY2009 (**Table 6**). However, in the past year Congress has expressed growing frustration with the slow pace of NAIS implementation relative to the funding outlays. The explanatory language that accompanied the FY2009 USDA appropriation (P.L. 110-8, Division A), explicitly directed APHIS "to make demonstrable progress" to implement the program, and to meet a number of specific objectives (regarding 48-hour traceback ability) that were in the agency's 2008 traceability business plan.

(...continued)

[50] Ibid.

[51] "Beef Trade With Japan in Rough Political Waters This Summer," *Oklahoma Farm Report*, July 15, 2009.

[52] "Banzai! A landslide victory for the DPJ in Japan," *The Economist*, August 31, 2009.

[53] "Beef Trade With Japan in Rough Political Waters This Summer," *Oklahoma Farm Report*, July 15, 2009.

[54] *The Legal Texts: The Results of the Uruguay Round of Multilateral Trade Negotiations*, WTO, Cambridge University Press©2009.

[55] Articles 4 and 5, Agreement on the Application of Sanitary and Phytosanitary Measures, *The Legal Texts*, WTO, Cambridge University Press©2009.

**Table 6. Congressional Funding for NAIS by Fiscal Year**

| Fiscal Year | Actual Funding | Statute |
|---|---|---|
| 2004 | $18,796,000 | CCC Funds[a] |
| 2005 | $33,197,000 | P.L. 108-447 |
| 2006 | $33,340,000 | P.L. 109-97 |
| 2007 | $33,107,000 | P.L. 110-5 |
| 2008 | $ 9,750,000 | P.L. 110-161 |
| 2009 | $14,500,000 | P.L. 111-8 |
| 2010 | Pending[b] | |
| **Sum to date** | **$142,687,000** | |

**Source:** Compiled by CRS from various statutes as cited.

a. Commodity Credit Corporation (CCC) funds were disbursed by then-Secretary of Agriculture Veneman using her administrative authority.

b. H.R. 2997 as passed by the House (July 9, 2009) eliminates funding for NAIS; the Senate-passed version (August 4, 2009) provides for $7.3 million in funding for NAIS. The difference will be reconciled in conference later in the year.

The Administration has proposed increasing the funding for the NAIS slightly to $14.6 million in FY2010. However, on June 11, 2009, the House Agriculture Appropriations Subcommittee voted to eliminate funding for USDA's NAIS from the FY2010 appropriations bill (H.R. 2997). Subcommittee chairwoman Rosa DeLauro, along with Collin Peterson, chairman of the House Agriculture Committee, both of whom have expressed interest in seeing a mandatory animal ID program passed into law, have also expressed frustration with the slow pace of national sign-up for NAIS. The full committee's report (H.Rept. 111-181) observes:

> After receiving $142 million in funding since FY2004, APHIS has yet to put into operation an effective system that would provide needed animal health and livestock market benefits. Until USDA finishes its listening sessions and provides details as to how it will implement an effective ID system, continued investments in the current NAIS are unwarranted.[56]

The Senate version of H.R. 2997 (originally S. 1406) originally provided for the entire $14.6 million proposed by the Administration. An amendment to zero out Senate funding for NAIS failed to pass in committee in July; however, another floor amendment (S.Amdt. 2230; introduced by Senators Tester and Enzi) was passed on August 3, 2009, that reduced the FY2010 funding to $7.3 million. The successful amendment explicitly restricts use of FY2010 funds to ongoing NAIS activities and purposes related to rulemaking for the program. The Senate version of H.R. 2997, as amended, was passed by the full Senate on August 4, 2009. House and Senate differences in NAIS funding for FY2010 are being resolved in conference.

[56] H.Rept. 111-181, "Agriculture, Rural Development, Food and Drug Administration, and Related Agencies Appropriations Bill, 2010," June 23, 2009, p. 24.

## Legislative Proposals

USDA has claimed it has existing authority, under the Animal Health Protection Act (7 U.S.C. 8301 *et seq.*), to implement an animal ID program. In the 110th Congress, several bills were proposed (but not adopted) aimed at clarifying USDA's authority or spelling out what type of program should be established. They included H.R. 1018, prohibiting USDA from carrying out a mandatory program and also seeking to protect the privacy of producer information under a voluntary system; H.R. 2301, establishing an industry-led Livestock Identification Board to manage a national ID system; and S. 1292, requiring USDA to implement a more comprehensive farm-to-consumer animal ID and meat traceability program. H.R. 3485 would have required comprehensive new traceability systems both for USDA-regulated meat and poultry and for other foods regulated by the U.S. Food and Drug Administration (FDA).

In the 111th Congress, the broader food traceability provisions of H.R. 814 (DeGette) and S. 425 (Brown) both include the requirement that FSIS establish, within one year, a system that can trace each animal to any premises in which it was held at any time prior to slaughter, and each carcass, carcass part, or meat/poultry product from slaughter through processing and distribution to the ultimate consumer. The bills also would authorize the Secretary of Agriculture to require records to be maintained and to provide access to them for purposes of traceability.

Traceability provisions have been incorporated into food safety legislation (H.R. 2749) approved by the House and into a bill (S. 510) expected to be the markup vehicle in the Senate, but these provisions would apply to FDA-regulated foods and not to FSIS-regulated meat and poultry products.

## Congressional Hearings

The 111th Congress has held two hearings on the national animal ID system (NAIS), both in the House. On March 11, 2009, the House Committee on Agriculture's Subcommittee on Livestock, Dairy, and Poultry held a public hearing to review animal identification systems. Then on May 5, 2009, the House Committee on Agriculture's Subcommittee on Livestock, Dairy, and Poultry held a joint public hearing with the Committee on Homeland Security's Subcommittee on Emerging Threats, Cybersecurity, and Science and Technology to review the National Animal Identification System. Previous Congresses have held public hearings on issues related to animal ID, including animal health and disease matters, as well as bio-security and agro-terrorism.

# Appendix A. Chronology of NAIS's Development

## Early U.S. History

Use of animal ID in the United States dates back at least to the 1800s, when hot iron brands were used throughout the U.S. West to identify ownership and prevent thievery.

### 1940s

During the 1940s, the APHIS predecessor at USDA initiated an extensive program to identify cattle vaccinated for brucellosis. The official brucellosis vaccination tag and ear tattoo provided USDA with a highly successful animal ID program for cattle for decades. However, since brucellosis has neared eradication in the United States, the system of tagging and ID has been phased out.

### 1950s-1980s

Individuals associated with animal industries recognized that finding potentially sick or exposed animals early in a disease outbreak was essential to containing the disease quickly. USDA slowly began piecing together plans for a national animal identification system.

### 1986-1988

Bovine spongiform encephalopathy (BSE) or "mad cow disease"—a fatal neurological disease—is first identified in the United Kingdom's cattle and dairy herds. BSE is believed to be transmitted mainly by feeding infected cattle parts back to cattle (a practice widespread in the UK at the time). Subsequent testing found BSE to be widespread in the UK's cattle population and resulted in the slaughter of 3.7 million cattle.

### 1997

An outbreak of foot and mouth disease (FMD) in swine in Taiwan cost $6.9 billion in losses and eradication costs, including the slaughter of 3.8 million pigs, and decimated its previously strong pork export market. Similarly, a major outbreak of Classical Swine Fever in the Netherlands resulted in the destruction of 12 million hogs and direct economic losses totaling $2.3 billion.

### 2001

An outbreak of FMD in cattle in the United Kingdom ultimately led to the forced slaughter of over 10 million sheep and cattle and cost an estimated $7.9 billion in losses and eradication costs.

### 2002

APHIS officials working with the National Institute for Animal Agriculture, the U.S. Animal Health Association, and other organizations helped to draft an early version of an animal ID plan.

## 2003

The preliminary work plan was expanded by a group of approximately 100 state, federal, and industry representatives—the National Identification Development Team—which produced an initial draft of the U.S. Animal Identification Plan (USAIP).

## December 2003

A draft "U.S. Animal Identification Plan (USAIP)" is published calling for recording the movement of individual animals or animal groups in a central database. APHIS' role was to design an ID numbering system, then allocate numbers to premises (e.g., farms, feedlots, auction barns, processing plants) and to animals or groups of animals. Finally, APHIS was to coordinate the data collection. The work plan envisioned by the USAIP had first called for all states to have an animal premises ID system by July 2004, with farm animals of all major species identified by July 2006. As the draft USAIP was being published in December 2003, the first case of bovine spongiform encephalopathy (BSE or mad cow disease) was detected in the United States.

Among the initiatives USDA quickly announced to shore up confidence in the beef supply was accelerated implementation of a verifiable national animal ID system including action taken by then-Secretary of Agriculture Ann Veneman who used her emergency authority to transfer $18.8 million of Commodity Credit Corporation (CCC) funds to APHIS for this purpose.

## April 27, 2004

Secretary Ann Veneman announced the framework for implementing the National Animal Identification System (NAIS). The outlines of the program have been periodically revised since then in response to changing circumstances and input from industry participants.

## May 2005

USDA issued a "Draft Strategic Plan" that included timelines for a mandatory program by January 2009.

## August 2005

USDA announced the Draft Program Standards with a new set of "guiding principles."

## April 2006

USDA unveiled a new plan—"Implementation Strategies"—that set a timeline for full implementation by 2009. The plan stated that the program was voluntary with a contingency that USDA would consider regulations that would require participation if voluntary participation levels were not adequate to have an effective program.[57]

[57] Ibid.

## August 2006

NAIS program was initially designed with a vision of ultimately transitioning from a voluntary program to a mandatory program. However, in response to various concerns raised by some producers, small farmers, and religious groups, then-Secretary of Agriculture Mike Johanns announces that NAIS would be entirely voluntary at the federal level.

## November 2006

USDA distributed a draft "user guide" as "the most current plan for the NAIS [which] replaces all previously published program documents, including the 2005 Draft Strategic Plan and Draft Program Standards and the 2006 Implementation Strategies." This user guide first identifies the proposed three-step approach—premises registration, animal ID, and traceability—to implementing a national animal ID program. The user guide sought to assure livestock producers that the program would remain voluntary, and that it is bound by law to protect individuals' private and confidential business information.

## December 2007

USDA's APHIS released the *National Animal Identification System (NAIS)—A User Guide and Additional Information Resource*.[58]

## April 2008

USDA's APHIS released *A Business Plan to Advance Animal Disease Traceability* in draft form. This same report is currently available with a September 2008 date.[59] The *Business Plan* attempted to further clarify current implementation strategies. It provided benchmarks to guide the NAIS' progress towards the long-term goal of 48-hour traceback of affected or exposed animals in the event of an animal disease outbreak. One of seven key strategies would be to prioritize species, with the primary commercial food animals in "Tier 1," along with horses that need a health certificate or test when moved. All other livestock and poultry would be in a lower-priority Tier 2. Another key objective would be to bring 70% of the cattle breeding herd into NAIS by the end of 2009.[60]

## January 13, 2009

APHIS published a proposed rule entitled, "Official Animal Identification Numbering System," (Docket No. APHIS-2007-0096) in the *Federal Register* for comment through March 16, 2009. The proposed rule would establish the seven-character PIN as the standard location identifier.

[58] Available at http://animalid.aphis.usda.gov/nais/naislibrary/documents/guidelines/NAIS-UserGuide.pdf.

[59] Available at http://animalid.aphis.usda.gov/nais/naislibrary/plans.shtml.

[60] This plan, released in draft form in April 2008 and currently bearing a September 2008 date, is *A Business Plan to Advance Animal Disease Traceability* available at http://animalid.aphis.usda.gov/nais.

## April 15, 2009 to June 30, 2009

Secretary of Agriculture Tom Vilsack undertook a series of public listening sessions—with a variety of stakeholders representing the full spectrum of views on the NAIS—around the country to gather feedback and input to assist Secretary Vilsack and USDA in making decisions about the future direction of animal identification and traceability in the United States.

## April 29, 2009

USDA's APHIS released the results of a comprehensive benefit-cost analysis—*KSU Cost-Benefit Study (2009)*—of the NAIS.

# Appendix B. International Animal ID and Traceability

## Organizations and Standards

The United States participates with its trading partners in several important international organizations that are involved in animal health, food safety, and trade in livestock and animal products including the CODEX alimentarius, the World Organization for Animal Health (OIE), and the World Trade Organization (WTO). In addition to U.S. participation in these international organizations, U.S. livestock and animal products are often subject to "export certification" standards imposed by importing countries.

As a member of the WTO, the United States agrees to abide by a set of international trade rules that seek to harmonize participation in international commerce and to provide for a framework for dispute settlement. In contrast, both the CODEX alimentarius and the OIE are designed to recommend scientifically-based standards for food safety and animal health, respectively, but such standards are not international laws; rather, they are intended as guidelines for countries when they are developing their own standards.[61]

### World Trade Organization (WTO)

In response to concerns that market access may be limited by use of non-tariff trade barriers, the WTO's Agreement on the Application of Sanitary and Phytosanitary Measures explicitly restricts the implementation of traceability measures applied to imports to two requirements. First, any traceability requirements must be scientifically justified based on an assessment of risk to human, animal or plant health. Second, they may be equivalent to, but not more rigorous than, the standards applied to domestic industry.[62]

### CODEX

The Codex Alimentarius Commission was created in 1963 by two United Nations' organizations —the Food and Agricultural Organization (FAO) and the World Health Organization (WHO)—to develop food standards, guidelines and related texts such as codes of practice under the Joint FAO/WHO Food Standards Program.[63] The main purposes of this program are protecting health of the consumers and ensuring fair trade practices in the food trade, and promoting coordination of all food standards work undertaken by international governmental and nongovernmental organizations.

[61] For more information on the relationship of U.S. participation in both the CODEX and OIE, see CRS Report RL33472, *Sanitary and Phytosanitary (SPS) Concerns in Agricultural Trade*, by Geoffrey S. Becker.

[62] Articles 4 and 5, Agreement on the Application of Sanitary and Phytosanitary Measures, *The Legal Texts*, WTO, Cambridge University Press©2009.

[63] For more information refer to the CODEX alimentarius website at http://www.codexalimentarius.net.

## World Organization for Animal Health (OIE)

Founded in 1924 as the Office International des Epizooties (OIE) and renamed in 2003 as the World Organization for Animal Health, the OIE is an intergovernmental organization responsible for improving animal health worldwide.[64] In its capacity as a leading international standard-setting organization for animal identification and traceability, the OIE helps its member countries and territories to implement animal identification and traceability systems in order to improve the effectiveness of their policies and activities relating to disease prevention and control, animal production food safety, and certification of exports.

In March 2006, the OIE's Terrestrial Animal Health Standards Commission established a first series of guidelines on identification and traceability on behalf of OIE Members, which democratically adopted them in May 2007 as official OIE standards in the *Terrestrial Animal Health Code*.[65] Chapter four of the OIE's *Terrestrial Code* includes two sections on animal identification and tracing: section 4.1 which defines general principles, and section 4.2 which provides general guidance on the design and implementation of systems.[66] In April 2008, the Director General of the OIE (Bernard Vallet) called for progressive implementation of animal identification and product traceability systems from the "farm to the fork" be progressively implemented worldwide.[67] Under internationally recognized OIE standards, robust animal identification and tracing systems would allow compartmentalization and regionalization of a disease outbreak so that trade could continue for animal products from other parts of the country. The OIE's *Terrestrial Code* includes two sections that deal with compartmentalization: section 4.3 which defines general principles of zoning and compartmentalization, and section 4.4 which discusses application of compartmentalization.[68]

## Export Certification

Certification is frequently part of export verification processes imposed by importing countries. In the United States, certification is handled by USDA's Food Safety and Inspection Service (FSIS).[69] Although each specific country can have its own specific beef importing requirements, certification generally refers to the idea that animal production methods and processing plants comply with the importer's veterinary, animal health, and sanitary standards. This often involves sanitary sampling and plant inspection by the importing country. The OIE contributes to harmonization of international certification standards through its various programs and via the promotion of transparency and reliance on scientific information as a basis for evaluation. Chapter 5 of the OIE's *Terrestrial Code* presents the general obligations related to certification as well as certification procedures.[70]

---

[64] More information on the OIE's organization and structure is available at http://www.oie.int.

[65] Available at http://www.oie.int/eng/normes/en_mcode.htm.

[66] Available at http://www.oie.int/eng/normes/en_chapitre_1.4.1.pdf and http://www.oie.int/eng/normes/en_chapitre_1.4.2.pdf.

[67] "Animal identification and product traceability from the farm to the fork must be progressively implemented worldwide," Bernard Vallat, July 15, 2008; available at http://www.oie.int/eng/Edito/en_edito_apr08.htm.

[68] Available at http://www.oie.int/eng/normes/en_chapitre_1.4.3.pdf and http://www.oie.int/eng/normes/en_chapitre_1.4.4.pdf.

[69] For more information, see "Regulations & Policies: Import Information," Food Safety and Inspection Service (FSIS), USDA, at http://www.fsis.usda.gov/regulations_&_policies/import_information/index.asp.

[70] Available at http://www.oie.int/eng/normes/en_chapitre_1.5.1.pdf and http://www.oie.int/eng/normes/ (continued...)

## Foreign Animal ID and Traceability Programs

Many of our international trading partners and competitors, including Argentina, Australia, Brazil, Canada, the European Union, Japan, New Zealand, South Korea, and Uruguay, have adopted national animal identification systems with traceability capabilities (**Table B-1**). [71]

**Table B-1. Comparison of International Cattle ID and Traceability Programs**

| | | Identification | | | | | |
|---|---|---|---|---|---|---|---|
| **Country** | **Date Begun** | **Premises** | **Individual Animal** | **Group or Lot** | **Electronic RFID** | **Animal Movement Traceability** | **Retire Animal Number** |
| **Mandatory** | | | | | | | |
| Argentina | 2007 | M | M | V | V | M | V |
| Australia | 2002 | M | M | V | M | M | M |
| Canada | 2002 | V | M | Not Allowed | M | V | M |
| EU | 1997 | M | M | V | V | M | M |
| Japan | 2003 | M | M | V | V | M | M |
| South Korea | 2004 | M | M | V | V | M | M |
| Uruguay | 2006 | M | M | V | M | M | M |
| **Voluntary** | | | | | | | |
| Brazil[a] | 2001 | M/V | M/V | V | V | V | V |
| Mexico | 2003 | V | V | V | V | V | V |
| New Zealand[b] | 1999 | M/V | M/V | V | V | V | V |
| United States | 2004 | V | V | V | V | V | V |

**Source:** The primary sources are M. B. Bowling, D. L. .Pendell, D. L. Morris, Y. Yoon, K. Katoh, K. E. Belk, and G. C. Smith, "Review: Identification and Traceability of Cattle in Selected Countries Outside of North America," *The Professional Animal Scientist* 24 (2008): 287-294; *Review of Selected Cattle Identification and Tracing Systems Worldwide*, MAF Biosecurity New Zealand Information Paper No: 2009/03; and New Zealand Ministry of Agriculture and Forestry, February 2009, plus CRS additions from various other source materials.

**Notes:** M = mandatory; V = voluntary. This is not intended to be a comprehensive list, but focuses on major producer, consumer, and trading nations.

a. Brazil's program is mandatory for beef being exported to markets that require origination information such as the EU.

b. New Zealand's animal ID program is mandatory for cattle as part of a tuberculosis eradication program.

(...continued)

en_chapitre_1.5.2.pdf.

[71] For more information, readers are referred to the following three articles from the volume 24, 2008 issue *The Professional Animal Scientist*. "Review: Identification and Traceability of Cattle in Selected Countries Outside of North America," M.B. Bowling, D.L.Pendell, D.L.Morris, Y.Yoon, K.Katoh, K.E. Belk, and G.C. Smith, pp. 287-294; "Review: Swine Traceability Systems in Selected Countries Outside of North America," J.L.Meisinger, D.L.Pendell, D.L.Morris, K.E. Belk, and G.C. Smith, pp. 295-301; and "Review: Sheep Traceability Systems in Selected Countries Outside of North America," P.D.Bass, D.L.Pendell, D.L.Morris, J.A. Scanga, K.E. Belk, T.G. Field, PAS, J.N. Sofos, J.D. Tatum, and G.C. Smith, pp. 302-307.

## Canada

The Canadian Cattle Identification Agency (CCIA)[72] is a federally incorporated, nonprofit, industry-led organization that manages, administers, and develops policy for Canada's national individual identification, tracking, and trace-back system for the Canadian cattle and bison industry. The CCIA is led by a Board of Directors made up of representatives from several sectors of the Canadian livestock industry.[73] The government's Canadian Food Inspection Agency (CFIA) is a non-voting board member of the CCIA. Agri-Food and Agriculture Canada (AAFC)—Canada's USDA counterpart—works closely with the CCIA to ensure that funding requirements for development and enhancement initiatives are met.

Animal identification for cattle in Canada was initially a voluntary program when first established in 2001, but was phased into a mandatory program on July 1, 2002. Initially, identification was based on traditional CCIA-approved ear tags. However, in 2003 the Canadian cattle industry committed to transitioning to Radio Frequency Identification (RFID). Since September 1, 2006, all cattle leaving their farm of origin must be tagged with a CCIA-approved RFID tag consisting of a transponder with encoded chip and antenna. According to the CCIA, RFID benefits include exceptional tag retention and readability, increased data integrity, ability to read at a distance without line of sight, and future capabilities of full animal movement tracking.

CCIA executive director Kerry St. Cyr, estimated that, as of March 2009, the nationwide compliance rate for Canadian cattle ID was between 99-100%.[74] With respect to privacy issues, St. Cyr stated that all personal information associated with ear tag number is securely maintained within the national database and is only accessed by authorized personnel in the event of an animal health issue. CCIA's repository—the Canadian Livestock Traceability System (CLTS)—houses the national ID and traceback systems for a variety of industry and species groups including dairy, beef, bison, sheep, pork, and poultry. The Canadian sheep and hog identification programs gained mandatory status in 2004 and 2008, respectively.

## Australia

The National Livestock Identification System (NLIS)[75] is Australia's system for identification and traceability of livestock. NLIS is a permanent whole-of-life system that allows individual animals to be identified electronically and tracked from property of birth to slaughter. A mandatory system for cattle has been in place since July 1, 2005, while a tracing system has been operational for sheep and goats since January 1, 2009. Similar tracing systems are under development for pigs and alpacas.[76]

[72] The CCIA official website is at http://www.canadaid.com/.

[73] For a list of industry groups and individual board members, see http://www.canadaid.com/about_us/about_us.html.

[74] Testimony provided by Mr. Kerry St. Cyr (CCIA executive director) to the House Committee on Agriculture's Sub-Committee on Livestock and Horticulture, March 11, 2009; available at http://agriculture.house.gov/hearings/statements.html.

[75] The NLIS official website is at http://lwx.dpi.qld.gov.au/lwx/nlis/pages/externalhome.htm.

[76] Testimony provided by Dr. Rob Williams, Agriculture Counselor, Embassy of Australia, Washington, D.C., to the House Committee on Agriculture's Subcommittee on Livestock and Horticulture, March 11, 2009; available at http://agriculture.house.gov/hearings/statements.html.

Australia began its animal identification system in the early 1960s in coordination with a national program to eradicate bovine tuberculosis and brucellosis. A mandatory property identification system for cattle was started in 1967 that identified herds in relation to a parcel of land; these were referred to as Property Identification Codes (PICs)—an eight-digit number that identifies the state, region, and specific location of a property—and provided the ability to trace all cattle back to their last property of residence. In the mid-1990s, the established visual-read-only PIC system was converted to an electronic (using Radio Frequency Identification Devices (RFIDs)) whole-of-life individual cattle identification system on the grounds that it was only a matter of time before such a system would be needed to ensure biosecurity, food safety and market access. In 1998, in response to a trading partner, individual identification was made compulsory for producers supplying the European Union (EU) market to provide meat from Hormone Growth Promotant-free cattle. In 1999, the NLIS was introduced.

In a 2004 audit of the NLIS—the National Livestock Tracing Audit—all of the animals identified using NLIS were traced to their property of origin within 24 hours.[77] In contrast, only 41% of cattle without NLIS tags were located within 24 hours. In 2005, NLIS expanded to mandatory animal identification for all cattle leaving their property of birth, and all stock movements must be read at points of transfer including saleyards and slaughterhouses.

In Australia, at slaughter each individual animal is assigned a unique ID number that is attached to a bar code. As a result, individual animal ID information is linked not only to live animals, but can also be linked to carcasses, hides, and byproducts of each animal. However, unless specific agreements are reached between producers and harvesting facilities, the animals are generally grouped into lots by harvest date and time, and the individual animal information (carcass data) is not available.

Australia's NLIS is a joint commitment and working partnership between the Australian Government at federal and state levels and Australian industry. However, the Federal government has an overall policy coordination role and supplies funding to underpin the national system. State governments have legal jurisdiction over the movement and health of livestock. The state governments work with industry in joint management committees to develop and implement legislation that underpins the animal identification program. This committee in each state coordinates extension and producer education programs such as demonstration sites, an assistance hotline and industry seminars that assist producers with on-farm use of technology. The state governments have established a registry of PICs, are responsible for ordering of identification devices and have assisted with establishing the reading infrastructure and more recently auditing device performance and monitoring compliance with legislative requirements.

A private industry company, Meat and Livestock Australia (MLA),[78] currently administers the database for NLIS. As a result, data collected through the NLIS are protected from Australian Freedom of Information (FOI). Privacy and "commercial-in-confidence" provisions of the Australian FOI Act offer additional protection via exemptions for this type of data.

[77] *Report of findings from a review of the operation of the National Livestock Identification System*, PricewaterhouseCoopers as prepared for the Australian Department of Agriculture, Fisheries and Forestry, December 22, 2006, p. 18.

[78] MLA is a producer owned company, working in partnership with industry and government, to achieve a profitable and sustainable red meat and livestock industry. It provides research and development and marketing services to the red meat industry.

## European Union

The European Union (EU) explicitly classifies animal identification as part of its "food safety" programs and has mandatory programs in place for the major commercial animal species.[79] The basic objectives for EU rules on the identification of animals are the localization and tracing of animals for veterinary purposes for the control of infectious diseases. EU species-specific ID systems have evolved over time in response to particular disease events including the outbreaks of classical swine fever in 1997 and foot-and-mouth disease in 2001, as well as the 1997 BSE crisis. As the various animal ID systems evolved within the EU, they have each incorporated trace back and general traceability as a system goal along with animal identification.

In April 1997, in response to the BSE crisis, the Council of the European Union implemented a mandatory system of permanent identification of individual bovine animals enabling reliable traceability from birth to death. All bovine animals were required, by January 1, 2000, to be identified with double ear tags that identify individual animals, a register must be maintained at each animal location (farm, market, etc.), cattle passports to record movements, and a computerized electronic national database includes both ID and tracking information.[80] On July 17, 2000, an additional regulation was passed that fully implemented and made mandatory the bovine ID and traceability system that is currently in place in the EU.[81]

In addition to tracking animals from birth through harvest, the EU regulations stipulate the labeling of meat products in the following way: 1) a reference number that links the meat product to the animal or animals of origin; 2) identification of the member state where the meat was harvested and processed; and 3) the harvesting or fabrication facility's approval number(s).[82] Mandatory food traceability has been a part of the general food law of the EU since January 1, 2005.[83]

Since July 1, 2000 it is compulsory for all equidae moving within the EU to be accompanied by a passport during their movements (on foot and during transport).[84] A mandatory identification system for porcine animals went into effect on August 28, 2008.[85] Initially adopted in December 2003, the EU's ID system for ovine and caprine animals was entered into in full force in July 2005.[86]

[79] More information on EU individual species identification and trace back programs is available at http://ec.europa.eu/food/animal/identification/index_en.htm.

[80] Regulation (EC) No. 82/97, 21 April 1997.

[81] Regulation (EC) No. 1760/2000, 17 July 2000.

[82] M. B. Bowling, D. L. Pendell, D. L. Morris, Y. Yoon, K. Katoh, K. E. Belk, and G. C. Smith, "Review: Identification and Traceability of Cattle in Selected Countries Outside of North America," *The Professional Animal Scientist* 24 (2008): 287-294.

[83] "EU Traceability Guidelines," USDA Foreign Agricultural Service (FAS), GAIN Report Number E35012, January 21, 2005.

[84] Commission Decision 2000/68/EC, 22 December 1999.

[85] European Council Directive 2008/71/EC, 15 July 2008.

[86] Council Regulation (EC) 21/2004 (of 17 December 2003), later amended by Commission Regulation (EC) No 933/2008 (of 23 September 2008).

## Japan

Japan has a mandatory bovine ID and traceability system (in place since December 1, 2004) that identifies and tracks individual domestic animals from birth through the production chain until purchased by consumers. Imported beef is presently not subject to the same traceability requirements as domestically produced beef. However, political pressure for such a requirement appears to be building.[87]

In response to a series of food safety crises in the early 2000s, including the discovery of bovine spongiform encephalopathy (BSE) in Japan's domestic cattle herd and a series of labeling scandals, the Japanese government implemented a series of animal traceability regulations and food safety oversight.[88] The first phase began in July 2002 when the Law Relating to Special BSE Countermeasures was enacted. As part of this new law, Japan implemented a set of bovine animal traceability and identification laws that required traceability of domestically produced beef from farms to slaughterhouses by December 1, 2003. In the second phase, Japan's Diet passed the Food Safety Basic Law on May 23, 2003, establishing the Food Safety Commission.[89] Then, in June 2003 the Beef Traceability Law was enacted that required traceability be extended from slaughterhouses to processors, distributors, and retailers by December 1, 2004.[90] As a result, Japanese retailers and restaurants now display animal identification numbers to allow consumers to reference information about the domestic beef that they buy and eat.

In June 2003, Japan's Ministry of Agriculture, Forestry, and Fisheries (MAFF) also announced a new Japan Agricultural Standard (JAS) program to certify the traceability of imported beef.[91] To gain certification, exporters must be able to provide all the same information required under the Law Relating to Special BSE Countermeasures—date of birth, sex, breed, name and address of owner, location of fattening, date fattening commenced, and slaughter date—plus the names of all feeds and pharmaceuticals used in producing the animal.

## South Korea

South Korea has a mandatory domestic Beef Traceability System (BTS). Initiated in 2004 as a voluntary program, the BTS became mandatory for domestically produced beef in 2009. The BTS requires individual identification and registration in a central database system (known as the Beef Traceability database). [92] The BTS operates as a whole-of-life traceability system, tracking each individual animal from birth to the consumer. For domestic beef produced under the BTS, Korean consumers can access a range of animal-specific information including the sex, breed, quality

[87] "Beef Trade With Japan in Rough Political Waters This Summer," *Oklahoma Farm Report*, Agricultural News, July 15, 2009.

[88] Roxanne Clemens, "Meat Traceability in Japan," *Iowa Ag Review*, Center for Agricultural and Rural Development (CARD), Iowa State University, fall 2003, pp. 4-5.

[89] "The Food Safety Basic Law," Food Safety Commission of Japan, available at http://www.fsc.go.jp/sonota/fsb_law1807.pdf.

[90] "Update: Japan's Beef Traceability Law," USDA, FAS, GAIN Report Number JA4094, December 29, 2004.

[91] "Meat Traceability in Japan," by Roxanne Clemens, *Iowa Ag Review*, CARD, Iowa State University, Fall 2003, pp. 4-5.

[92] M. B. Bowling, D. L. Pendell, D. L. Morris, Y. Yoon, K. Katoh, K. E. Belk, and G. C. Smith, "Review: Identification and Traceability of Cattle in Selected Countries Outside of North America," *The Professional Animal Scientist* 24 (2008): 287-294.

grade, location of birth and subsequent premises, owner's personal information, feed administered, medications given, location and date of slaughter, date of inspection, and location of processing.

In July 2009, a South Korean Agriculture official reported that the South Korean government intends to impose traceability requirements on imported beef as soon as December 2010. [93]

## New Zealand

New Zealand does not have a fully functioning national animal ID system. In August 2004, the Animal Identification and Traceability Working Group (AITWG) was established when industry approached the government to work together to improve animal traceability in New Zealand. In March 2006, an Animal Identification and Traceability Governance Group (AITGG) was established to oversee the development of a new animal ID system under the name NAIT (National Animal Identification and Tracing). As of early 2009, NAIT still exists more as a project under development than as a functioning system.

Currently New Zealand has several partial systems that allow for traceability at herd levels but fail to provide effective traceability for individual animals. In addition, these partial systems leave substantial coverage gaps at the national level. The current focus is on developing traceability for cattle and deer populations. The Ministry of Agriculture and Forestry (MAF) has stated that the addition of other species—whether flock/group or individual identification—to the NAIT system should only be considered once the system is up and running for cattle and deer.[94]

New Zealand's existing animal ID systems began under the Bio-security Act of 1993 which provided for two systems of partial bovine animal ID: the Management Information System for Dairy Administration (MINDA) and the National Bovine Tuberculosis Identification Program (NBTIP). MINDA is a voluntary livestock and herd management system that has very high dairy herd participation (97%) in New Zealand. However, MINDA was not designed and does not function well for animal traceability. In contrast, the NTBIP is a mandatory, herd-based system that requires the identification of cattle and deer before movement from their property of origin. In addition to these two systems, several other private and governmental traceability databases are available for producers' use on a voluntary basis. A new mandatory animal identification system for cattle and possibly deer is proposed to be in place by June 2011.[95] The inclusion of deer is dependent on confirmation of the in-field performance of radio frequency tags.

## Brazil

In 2001, Brazil created the Brazilian Bovine and Buffalo Identification and Certification System (SISBOV, now renamed ERAS) as a farm-level identification system for cattle. [96] In September

[93] Brett Stuart, "S. Korea Traceability Requirement," *CattleFax Update*, vol. 41, issue 28, July 10, 2009, p. 4.

[94] "Position of Ministry of Agriculture and Forestry (MAF) on NAIT", undated, available at http://www.maf.govt.nz/mafnet/maf-positon-on-nait.pdf.

[95] "Animal Identification and Tracing – NAIT timeline," MAF, New Zealand, available at http://www.maf.govt.nz/mafnet/animal-identification-and-tracing.htm.

[96] M. B. Bowling, D. L. Pendell, D. L. Morris, Y. Yoon, K. Katoh, K. E. Belk, and G. C. Smith, "Review: Identification and Traceability of Cattle in Selected Countries Outside of North America," *The Professional Animal Scientist* 24 (2008): 287-294.

2006, SISBOV was extended to include the entire beef chain rather than just producers. Initially, SISBOV was intended as a mandatory program for identification of individual animals with a target date of 2008 for mandatory national participation; however, Brazil's domestic market had little demand for origination information and Brazilian cattle producers resisted adoption. As a result, SISBOV remains a voluntary program focused primarily on those premises engaged in providing animals to slaughterhouses that supply products destined for foreign markets that require origination information—most notably the EU which was Brazil's largest beef export market at that time and which requires substantial identification and traceability criteria for imported animal products. In addition, instead of identifying individual animals, animal classification has been by group lot under SISBOV. The EU has accepted individual tags for each group of cattle sold to export slaughterhouses.

Since 2003, successive audits of SISBOV conducted by the EU's Food and Veterinary Office (EU/FVO) have found severe shortcomings in Brazil's animal identification and traceability system.[97] In 2008, the EU imposed a near-total ban on beef imports from Brazil, unless they were sourced from farms that had been approved by Brussels.[98] However, in a report released on August 4, 2009, the EU/FVO suggests that the situation in Brazil was getting worse. Europe has two major concerns: a lack of robust information, and the fear that foot-and-mouth disease could inadvertently enter the EU from Brazil.

## Argentina

In 2003, Argentina established a limited mandatory system of animal identification and traceability—the Argentine Animal Health Information System (SGS)[99]—directed at animal products destined for the EU. [100] The Argentine system included farm-of-origin information and permits that document cattle movements including whether the animals have been in areas exposed to FMD.[101] However, as in Brazil, Argentina operates its animal identification system primarily for identifying cattle (generally in group lots) destined for export markets.

Starting in 2007, official ID tagging has been required for all calves born after September 2007. The compulsory cattle identification program will facilitate tracking cattle from birth to slaughter; however, the entire Argentine beef herd is not expected to be tagged until 2017.

Because Argentina has traditionally been unable to control disease outbreaks—particularly foot and mouth disease (FMD)—its beef exports to the United States have been primarily restricted to thermo-processed beef (heated to a specific temperature for a specified amount of time).[102] These

[97] *Review of Selected Cattle Identification and Tracing Systems Worldwide*, MAF Biosecurity New Zealand Information Paper No: 2009/03, prepared by the MAF Biosecurity New Zealand, February 2009; available at http://www.maf.govt.nz/mafnet/review-cattleident-systems-worldwide.pdf.

[98] Dan Buglass, "Ban on Brazilian Beef Urged as EU finds Multiple Failings," *TheBeefSite.com*, August 5, 2009.

[99] Sistema de Gestion Sanitara or SGS in Spanish.

[100] *Review of Selected Cattle Identification and Tracing Systems Worldwide*, MAF Biosecurity New Zealand Information Paper No: 2009/03, prepared by the MAF Biosecurity New Zealand, February 2009; available at http://www.maf.govt.nz/mafnet/review-cattleident-systems-worldwide.pdf.

[101] Michael McConnell and Ken Mathews, Jr., "Global Market Opportunities Drive Beef Production Decisions in Argentina and Uruguay," *Amber Waves*, April 2008.

[102] Ibid.

export limitations provide ample incentive for Argentina to improve its animal identification and traceability system.[103]

### Uruguay

Uruguay is very dependent on external markets for selling a large portion of its annual domestic production. An estimate 68% of Uruguay's annual beef production was sold in foreign markets during the 2004-2008 period. As a result, Uruguay has a strong incentive to provide animal identification and traceability information as demanded by foreign buyers; however, it is only since late 2006 that Uruguay has been able to institute a comprehensive national program.

On September 1, 2006, Uruguay's Ministry of Livestock, Agriculture, and Fisheries (MAGyP) implemented a mandatory animal identification system called the National Livestock Information System (SNIG).[104] Under SNIG, all individual animals must be identified (i.e., tagged) before 6 months of age or before they are transported from their property of birth. Two tags are required for all cattle, one highly visible and one electronic, e.g., an RFID device. In addition, the appropriate paperwork that tracks cattle from birth to slaughter must accompany each animal. The Uruguayan government plans to have all herds registered and all cattle tagged by 2010. At that point, the government will require traceability be extended, not just to the point of slaughter, but also to all cuts of beef back to specific animals at their farm of origin.

SNIG builds on Uruguay's national premises identification system (DICOSE)—established in 1973—which, for participating producers, provided information on each individual animal in their herds. Private individuals or companies registered within SNIG must be used for movement notification. Termination records are recorded by MAGyP. The SNIG database then includes premises and animal identification, movements, and termination data. SNIG does not yet mandate further traceability to consumers, although this is under consideration. The Uruguayan government currently pays for the ID tags, although it plans to shift the cost to the producers at some point in the future.

## Countries Not Implementing Animal ID Programs[105]

Not all countries with large animal populations have on-going animal ID programs—examples include Bangladesh, India, Indonesia, and Russia. Reasons for the non-existence of animal ID programs in these countries include the following. Many of these countries have large land masses consisting of mainly agrarian populations that are not technologically advanced. Also, several of these countries lack national distribution chains for animal products, instead relying on local production and marketing processes. Alternately, in many poorer countries of the world, consumers are simply unable financially to be overly discriminating in their choice of animal products. As a result, many lower-income consumers are not willing to pay a premium for food that is identified and traceable.

[103] Ibid.

[104] M. B. Bowling, D. L. Pendell, D. L. Morris, Y. Yoon, K. Katoh, K. E. Belk, and G. C. Smith, "Review: Identification and Traceability of Cattle in Selected Countries Outside of North America," *The Professional Animal Scientist* 24 (2008): 287-294.

[105] Ibid.

**Table B-2. Comparison of Cattle, Swine, and Poultry Populations by Country**

(data for 2007)

| | Cattle | | | Swine | | | Poultry[a] | | |
|---|---|---|---|---|---|---|---|---|---|
| **Rank** | **Country** | **Million** | **%** | **Country** | **Million** | **%** | **Country** | **Million** | **%** |
| 1 | Brazil | 200 | 15% | China | 426 | 46% | China | 4,815 | 26% |
| 2 | India | 177 | 13% | EU-27 | 162 | 18% | United States | 2,322 | 12% |
| 3 | United States | 97 | 7% | United States | 62 | 7% | EU-27 | 1,448 | 8% |
| 4 | EU-27 | 90 | 7% | Brazil | 36 | 4% | Indonesia | 1,275 | 7% |
| 5 | China | 82 | 6% | Viet Nam | 27 | 3% | Brazil | 1,144 | 6% |
| 6 | Argentina | 51 | 4% | Russian Fed. | 16 | 2% | India | 560 | 3% |
| 7 | Ethiopia | 43 | 3% | Mexico | 16 | 2% | Mexico | 501 | 3% |
| 8 | Sudan | 41 | 3% | Canada | 15 | 2% | Iran | 423 | 2% |
| 9 | Mexico | 32 | 2% | India | 14 | 2% | Russian Fed. | 368 | 2% |
| 10 | Pakistan | 31 | 2% | Philippines | 13 | 1% | Turkey | 350 | 2% |
| 11 | Australia | 28 | 2% | Japan | 10 | 1% | Japan | 289 | 2% |
| 12 | Colombia | 27 | 2% | South Korea | 10 | 1% | Pakistan | 263 | 1% |
| 13 | Bangladesh | 25 | 2% | Thailand | 8 | 1% | Thailand | 209 | 1% |
| 14 | Russian Fed. | 22 | 2% | Ukraine | 8 | 1% | Bangladesh | 207 | 1% |
| 15 | Tanzania | 18 | 1% | Myanmar | 7 | 1% | Malaysia | 190 | 1% |
| | Other | 514 | 38% | Other | 90 | 10% | Other | 4,316 | 23% |
| | **World Total** | **1,357** | **100%** | **World Total** | **918** | **100%** | **World Total** | **18,679** | **100%** |

**Source:** Food and Agricultural Organization (FAO), United Nations, FAOSTAT; August 7, 2009. FAO's database includes data for 188 countries.

a. Includes chickens, geese, guinea fowl, and turkeys.

**Table B-3. Comparison of Goats and Sheep, and Equidae, Populations by Country**

(data for 2007)

| | Goats and Sheep | | | Equidae[a] | | |
|---|---|---|---|---|---|---|
| **Rank** | **Country** | **Million** | **%** | **Country** | **Million** | **%** |
| 1 | China | 426 | 22% | China | 18 | 16% |
| 2 | India | 162 | 8% | Mexico | 13 | 11% |
| 3 | EU-27 | 62 | 3% | United States | 10 | 9% |
| 4 | Sudan | 36 | 2% | Brazil | 8 | 7% |
| 5 | Australia | 27 | 1% | Ethiopia | 6 | 6% |
| 6 | Nigeria | 16 | 1% | Pakistan | 5 | 4% |
| 7 | Pakistan | 16 | 1% | EU-27 | 5 | 4% |
| 8 | Iran | 15 | 1% | Argentina | 4 | 4% |
| 9 | Bangladesh | 14 | 1% | Colombia | 4 | 3% |
| 10 | Ethiopia | 13 | 1% | Egypt | 3 | 3% |
| 11 | New Zealand | 10 | 1% | Mongolia | 2 | 2% |
| 12 | Turkey | 10 | 1% | Iran | 2 | 2% |
| 13 | South Africa | 8 | 0% | Niger | 2 | 2% |
| 14 | Mongolia | 8 | 0% | Mali | 2 | 2% |
| 15 | Somalia | 7 | 0% | Morocco | 2 | 1% |
| | Other | 1,089 | 57% | Other | 28 | 25% |
| | **World Total** | **1,917** | **100%** | **World Total** | **113** | **100%** |

**Source:** FAO, United Nations, FAOSTAT; August 7, 2009. FAO's database includes data for 188 countries.

a. Horses, mules, and donkeys.

## Table B-4. Global Beef Production and Trade Rankings by Country

(data are carcass-weight averages for calendar years 2007 and 2008)

| | Production | | | Exports | | | | Imports | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Rank | Country | 1,000 mt | % of prod. | Country | 1,000 mt | % of Exp. | % of Dom Prod. | Country | 1,000 mt | % of Imp. | % of Dom Cons. |
| 1 | United States | 12,130 | 21% | Brazil | 1,995 | 26% | 22% | United States | 1,268 | 18% | 10% |
| 2 | Brazil | 9,164 | 16% | Australia | 1,404 | 18% | 65% | Russia | 1,084 | 16% | 45% |
| 3 | EU-27 | 8,144 | 14% | United States | 753 | 10% | 6% | Japan | 673 | 10% | 57% |
| 4 | China[a] | 6,131 | 10% | India | 652 | 9% | 27% | EU-27 | 553 | 8% | 6% |
| 5 | Argentina | 3,225 | 5% | New Zealand | 515 | 7% | 82% | Mexico | 406 | 6% | 16% |
| 6 | India | 2,442 | 4% | Argentina | 478 | 6% | 15% | South Korea | 302 | 4% | 57% |
| 7 | Mexico | 2,216 | 4% | Canada | 476 | 6% | 37% | Venezuela | 253 | 4% | 38% |
| 8 | Australia | 2,166 | 4% | Uruguay | 373 | 5% | 66% | Egypt | 249 | 4% | 42% |
| 9 | Russia | 1,343 | 2% | Paraguay | 214 | 3% | 49% | Canada | 236 | 3% | 32% |
| 10 | Canada | 1,282 | 2% | EU-27 | 171 | 2% | 2% | Philippines | 156 | 2% | 41% |
| 11 | Pakistan | 1,105 | 2% | Colombia | 160 | 2% | 19% | Malaysia | 146 | 2% | 86% |
| 12 | Colombia | 830 | 1% | Vietnam | 110 | 1% | 45% | Chile | 140 | 2% | 56% |
| 13 | So. Africa | 679 | 1% | China | 70 | 1% | 1% | China | 120 | 2% | 2% |
| 14 | New Zealand | 626 | 1% | Mexico | 42 | 1% | 2% | Vietnam | 115 | 2% | 22% |
| 15 | Uruguay | 564 | 1% | Ukraine | 37 | 0% | 7% | Taiwan | 103 | 1% | 95% |
| | Other | 6,674 | 11% | Other | 158 | 2% | | Other | 1,178 | 17% | |
| | **World** | **58,718** | **100%** | **World** | **7,604** | **100%** | **13%** | **World** | **6,978** | **100%** | **12%** |

**Source:** USDA, Foregion Agricultural Service (FAS), Production, Supply and Demand (PSD) data base, Aug. 12, 2009 Data Release

**Notes:** Totals include only those countries that make up USDA's official PSD database. This means totals do not encompass total global production, consumption, and trade, but rather the sum of those countries reported in USDA's database, which represents the most important players in the world meat PSD situation. In an attempt to capture these major players, the list of countries reported changes periodically.

a. China includes Hong Kong data.

## Table B-5. Global Pork Production and Trade Rankings by Country

(data are carcass-weight averages for calendar years 2007 and 2008)

| | Production | | | Exports | | | | Imports | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Rank | Country | 1,000 mt | % of Prod. | Country | 1,000 mt | % of Exp. | % of Dom Prod. | Country | 1,000 mt | % of Imp. | % of Dom Cons. |
| 1 | China[a] | 44,639 | 46% | United States | 1,771 | 31% | 17% | Japan | 1,239 | 23% | 50% |
| 2 | EU-27 | 22,694 | 23% | EU-27 | 1,501 | 27% | 7% | Russia | 974 | 18% | 33% |
| 3 | United States | 10,281 | 11% | Canada | 1,081 | 19% | 57% | China | 638 | 12% | 1% |
| 4 | Brazil | 3,003 | 3% | Brazil | 678 | 12% | 23% | Mexico | 493 | 9% | 32% |
| 5 | Russia | 1,985 | 2% | China | 287 | 5% | 1% | South Korea | 439 | 8% | 29% |
| 6 | Canada | 1,907 | 2% | Chile | 145 | 3% | 28% | United States | 408 | 7% | 5% |
| 7 | Vietnam | 1,841 | 2% | Mexico | 86 | 2% | 7% | Canada | 183 | 3% | 18% |
| 8 | Japan | 1,250 | 1% | Australia | 51 | 1% | 14% | Ukraine | 160 | 3% | 22% |
| 9 | Philippines | 1,218 | 1% | Vietnam | 15 | 0% | 1% | Australia | 147 | 3% | 32% |
| 10 | Mexico | 1,156 | 1% | South Korea | 12 | 0% | 1% | Singapore | 94 | 2% | 85% |
| 11 | South Korea | 1,050 | 1% | Serbia | 5 | 0% | 2% | Croatia | 50 | 1% | 46% |
| 12 | Taiwan | 910 | 1% | Croatia | 3 | 0% | 4% | Angola | 50 | 1% | 61% |
| 13 | Ukraine | 575 | 1% | Taiwan | 3 | 0% | 0% | EU-27 | 45 | 1% | 0% |
| 14 | Chile | 511 | 1% | South Africa | 3 | 0% | 0% | Philippines | 36 | 1% | 3% |
| 15 | Australia | 367 | 0% | Norway | 2 | 0% | 1% | New Zealand | 36 | 1% | 41% |
| | Other | 3,186 | 3% | Other | 12 | 0% | | Other | 533 | 10% | |
| | **World** | **96,571** | **100%** | **World** | **5,650** | **100%** | **6%** | **World** | **5,502** | **100%** | **6%** |

**Source:** USDA, FAS, PSD data base, Aug. 12, 2009 Data Release

**Notes:** Totals include only those countries that make up USDA's official PSD database. This means totals do not encompass total global production, consumption, and trade, but rather the sum of those countries reported in USDA's database, which represents the most important players in the world meat PSD situation. In an attempt to capture these major players, the list of countries reported changes periodically.

a. China includes Hong Kong data.

## Table B-6. Global Poultry Production and Trade Rankings by Country

(data are ready-to-cook-equivalent averages for calendar years 2007 and 2008)

| | Production | | | Exports | | | | Imports | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Rank | Country | 1,000 mt | % of Prod. | Country | 1,000 mt | % of Exp. | % of Dom Prod. | Country | 1,000 mt | % of Imp. | % of Dom Cons. |
| 1 | United States | 19,123 | 26% | Brazil | 3,278 | 38% | 29% | Russia | 1,268 | 16% | 46% |
| 2 | Chinaa | 11,620 | 16% | United States | 3,196 | 38% | 17% | EU-27 | 784 | 10% | 8% |
| 3 | Brazil | 11,153 | 15% | EU-27 | 812 | 10% | 8% | Japan | 717 | 9% | 37% |
| 4 | EU-27 | 10,215 | 14% | Thailand | 340 | 4% | 29% | China | 706 | 9% | 4% |
| 5 | Mexico | 2,759 | 4% | China | 322 | 4% | 3% | Mexico | 625 | 8% | 23% |
| 6 | India | 2,365 | 3% | Canada | 73 | 2% | 15% | Saudi Arabia | 490 | 6% | 47% |
| 7 | Russia | 1,505 | 2% | Argentina | 145 | 2% | 11% | UAE | 264 | 3% | 91% |
| 8 | Iran | 1,424 | 2% | Kuwait | 65 | 1% | 149% | Venezuela | 258 | 3% | 25% |
| 9 | Argentina | 1,370 | 2% | Chile | 51 | 1% | 10% | South Africa | 247 | 3% | 22% |
| 10 | Japan | 1,259 | 2% | UAE | 30 | 0% | 83% | Vietnam | 206 | 3% | 26% |
| 11 | Canada | 1,184 | 2% | Australia | 26 | 0% | 4% | Ukraine | 196 | 2% | 36% |
| 12 | Thailand | 1,095 | 1% | Mexico | 14 | 0% | 0% | Iraq | 194 | 2% | 72% |
| 13 | South Africa | 1,045 | 1% | Singapore | 12 | 0% | 28% | Kuwait | 171 | 2% | 223% |
| 14 | Colombia | 968 | 1% | Saudi Arabia | 10 | 0% | 2% | Angola | 154 | 2% | 95% |
| 15 | Malaysia | 938 | 1% | South Korea | 8 | 0% | 0% | Cuba | 151 | 2% | 93% |
| | Other | 6,916 | 9% | Other | 39 | 0% | | Other | 1,438 | 18% | |
| | **World** | **74,937** | **100%** | **World** | **8,518** | **100%** | **11%** | **World** | **7,866** | **100%** | **11%** |

**Source:** USDA, FAS, PSD data base, Aug. 12, 2009 Data Release

**Notes:** Totals include only those countries that make up USDA's official PSD database. This means totals do not encompass total global production, consumption, and trade, but rather the sum of those countries reported in USDA's database, which represents the most important players in the world meat PSD situation. In an attempt to capture these major players, the list of countries reported changes periodically.

a. China includes Hong Kong data.

## Author Contact Information

Randy Schnepf
Specialist in Agricultural Policy
rschnepf@crs.loc.gov, 7-4277

## Acknowledgments

This report builds upon and replaces CRS Report RS22653, *Animal Identification: Overview and Issues*, by Geoffrey S. Becker.