

A Policy Recommendation Regarding
The National Animal Identification System within the United States

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ABSTRACT

Individual identification of livestock within the U.S. is not a new concept. It has been documented in large animal production industries dating back to the late 1800's and early 1900's (Richey, 2005) Cattle ranchers, to indicate ownership and deter theft, first used hot iron branding. Hot iron branding was also used on horses. Swine were identified through small triangle shaped notches made in their ear.

The initial livestock diseases to receive attention within the United States, with a Public Health implication, were Brucellosis and Tuberculosis. A Surveillance Program was established for both diseases. Efforts to eradicate brucellosis caused by *Brucella abortus* in the United States began in 1934 (Ragan, 2002). In the beginning the program began with routine blood testing of cattle herds. Later, blood was collected at slaughter for testing purposes. Identified herds were quarantined. Producers were given an option of either continued routine testing of animals with removal to slaughter of those testing positive or sell the herd to the government for slaughter. Concurrent vaccination of heifer calves against Brucellosis also contributed to the decline of this disease in the cattle population.

At the dawn of the twentieth century, Tuberculosis was the leading cause of death in the United States among humans (Olmstead 2004). The tuberculosis eradication program officially began in the United States in 1917. At that time it was estimated that 1 out of every 20 cattle slaughtered had bovine tuberculosis (Bruning-Fann, 1998). Most human cases were associated with the consumption of unpasteurized milk.

The primary method of identification of cattle within these disease programs was via a metal ear tag. Orange colored tags were applied to calves when vaccinated for Brucellosis and

metal ear tags were applied at the time animals were blood tested. A critical component of a successful surveillance program is permanent animal identification (Ragan, 2002).

Over the years, as these diseases have been brought under control, fewer cattle (livestock) have been permanently identified. Today, less than 10% of cattle are vaccinated for Brucellosis. During this same time period, personnel within individual States Department of Agriculture have decreased as have United States Department of Agriculture personnel. In December 2003, a cow was identified as the first within the United States to be diagnosed with Bovine Spongiform Encephalopathy (BSE). After a six week investigation, U.S. authorities announced that they were ending their BSE field investigation after identifying only 28 of 80 cows that had entered the United States from Canada with the BSE cow (Becker, 2006).

To address current and future disease concerns, a national animal identification system was proposed. A key goal of this plan was to identify all animals and premises potentially exposed to a foreign animal disease, or a domestic disease of concern within forty eight hours of discovery. Such a program would be valuable to the United States efforts to identify and contain diseases among livestock.

Animal Identification – A Look Back

Individual livestock identification has been noted dating back to the 1800's. Cattle ranchers, to indicate ownership and deter theft, first used hot iron branding (Richey 2005). This practice is a mainstay of many westerns on television. This procedure was also used for horses. A brand, unique to the ranch was heated in a fire. The brand was placed onto the thigh of the animal where it burned the figure into the skin. Cattle were not contained within pastures but rather roamed out in the open. By the animals being branded, it could be determined which cattle belonged to which owner if they should inter-mingle. Swine were identified through making triangle shaped notches in their ears.

At the dawn of the twentieth century, Tuberculosis was the leading cause of death in the United States among humans (Olmstead 2004). At that time it was estimated that 1 out of every 20 cattle slaughtered had bovine tuberculosis (Bruning-Fann, 1998). As a result, the United States Department of Agriculture (USDA) began a campaign to eradicate this disease from the cattle population. Most people became infected through consumption of unpasteurized milk. Cattle were tested for this disease in great numbers.

Efforts to eradicate brucellosis caused by *Brucella abortus* in the United States began in 1934 (Ragan, 2002). This disease, called undulant fever in humans, caused severe flu like symptoms (Centers for Disease Control 2009). Initially this program centered on blood testing of cattle herds. The Brucellosis and Tuberculosis eradication plans were similar in the way positive animals were handled. Farms containing positive testing animals were provided two options: removal for slaughter all animals testing positive and continued retesting of the herd until no new positive cases were identified or sell the entire herd to the federal government for slaughter

purposes. The net effect of both of these options was the removal of positive animals from farms. Both programs necessitated the individual identification of all animals tested.

Brucellosis has now been eliminated from the cattle population of the United States. In 2008, for the first time in the 74 year history of the Brucellosis program, all 50 states, Puerto Rico, and the U.S. Virgin Islands were simultaneously free for a brief period of time (Donch 2008). A case in cattle was subsequently identified in Montana. The last remaining source of *Brucella abortus* can be found within the Greater Yellowstone Area affecting bison and elk.

The success of the Brucellosis and Tuberculosis program has provided almost all states the ability to declare themselves free of these diseases. This allows for freedom of movement without prior testing. As a result, fewer cattle are identified and tested yearly for these diseases.

The National Animal Identification System

The effort to establish a national standardized identification system began in early 2002, when the National Institute for Animal Agriculture's (NIAA) Animal Identification and Information System committee organized a task force of approximately 70 representatives from more than 30 stakeholder groups (United States Department of Agriculture 2003). Using input from that meeting, a final draft of the work plan was presented to the United States Animal Health Association (USAHA) at its annual meeting in October 2002. USAHA accepted the plan with a resolution that called for Veterinary Services (VS) in USDA's Animal and Plant Health Inspection Service (APHIS) to establish a national animal identification development team that would develop a national plan using the work plan as a guide.

The National Animal Identification System (NAIS) was developed for the purpose of identifying all agricultural animals within the United States and to track them as they come into

contact with, or are mixed with animals other than herd-mates from their premises of origin. In the event of an animal disease outbreak, a history of the infected animal(s) movement could be documented within forty eight hours of identification. Forty eight hours was determined to represent the optimum time frame in order for effective disease containment to be accomplished.

The following are reasons why livestock need to be identified within the United States (United States Department of Agriculture 2009a).

- Foreign Animal Disease control, surveillance, and prevention
- Biosecurity protection of the national herd
- Identification of livestock vaccinated or tested under official disease control or eradication program
- Official identification of animals in interstate or international commerce
- Accurate identification of blood and tissue specimens
- Improvement of laboratory diagnostic and reporting capabilities
- Health status certification of herds, States, and Regions
- Effective regionalization and risk assessment in support of international trade

When a disease event occurs within a livestock species it is necessary to know (United States Department of Agriculture 2009b):

- Where the animal(s) currently reside
- Where the animal(s) have been
- Identification of all animal(s) exposed

The National Animal Identification System was designed to accomplish these goals by providing a three phase approach:

- Premises Registration
- Individual Animal Identification
- Animal Tracing

The initial part of the plan calls for premises registration via the acquisition of a premises identification number (PIN). The premises registration system is a database program that stores necessary information about a premise, which is assigned a unique identification number. Information necessary for collection includes, name, contact information (address, phone number, email address), type of operation (corporation, partnership, etc), and the species of animals maintained on the premises. The unique identification number contains seven alphanumeric characters (e.g. A123R50.) This premises identification number is attached to the property that contains livestock. This number is transferable if the land is sold to someone else. The premise identification number functions as an E - 911 address for agricultural emergencies. Efforts to begin phase one began in July 2004 (National Institute for Animal Agriculture 2003). At the close of 2007, more than 439,000 premises in U.S. States, Tribes, and territories had been registered. This total represents more than 31 percent of the estimated number of premises nationwide (United States Department of Agriculture 2007). As of February 18, 2009 a total of 504,226 premises have been registered within the United States (United States Department of Agriculture 2009b).

The second portion of the plan calls for individual animal identification. Species specific working groups were assembled at the national level to determine the optimum manner to identify each species. It was determined that every animal needing to be identified individually

would have a unique 15 character number. Groups or lots of animals that typically travel together through the production & slaughter chain (commercial poultry and swine) would be identified through a 13 character number. The 15 character number would begin with 840. This number would identify the animals as being born in the United States. Priority designations have been proposed for livestock by the United States Department of Agriculture (United States Department of Agriculture 2009c). Aquatic species and sheep have a low priority for identification. Swine, poultry, deer, horses and goats have been designated a medium priority. Cattle have been designated as a high priority due to their large numbers, frequent interstate movement, disease issues and lack of uniform, permanent identification. Industry has taken the lead in this area with the utilization of the Radio Frequency Identification Device ear tags. These tags transmit their assigned number when activated by an electronic device developed for that purpose. Efforts to begin phase two began in 2006.

The last component calls for the tracing of animal(s) movement as they intermingle with others away from their premises of origin. All animals that have had contact with a diseased animal will need to be located within the established forty eight hour time span such that an effective disease containment and response can occur. The basic principle with animal tracing is to identify what animal (individual Animal Identification Number) was at what premises (Premises Identification Number) on what date. This portion of the plan is the most difficult and will take several years to be fully functional because information technologies required to capture movement records is not in place. .

Initially the NAIS program was to be mandatory, but responding to opposition from some industry groups, the USDA made the program voluntary in 2006 (Guinto 2007). The program

continues to be promoted by the USDA as well as the individual states. The need for this program has been documented but its future is still to be determined.

Country of Origin Labeling

On May 13, 2002 the Farm Security and Rural Investment Act was passed by the Federal Government (United States Department of Agriculture 2009d). A portion of this bill created the mandatory Country of Origin Labeling (COOL) which was to provide consumers information to make informed decisions concerning their purchases. The effective date of implementation was postponed several times but eventually went into effect September 30, 2008. It was anticipated that this law might promote U.S. food products. It requires that a retailer of a covered commodity would identify the country of origin of the product. The “covered commodities” are defined as (Kansas State University 2008):

- Beef, lamb and pork – muscle cuts and ground
- Fish and shellfish – farm-raised and wild
- Fruits and vegetables – fresh and frozen
- Peanuts

Food service establishments, such as restaurants, lunchrooms, cafeterias, food stands, bars, lounges, and similar enterprises are exempt from the mandatory country of origin labeling requirements (United States Department of Agriculture 2009e).

Retailers are working closely with their meat suppliers to ensure compliance with the new law. Producers who sell cattle, swine and sheep at livestock markets are required to complete and sign an affidavit attesting that the animal(s) being sold were born in the United States (Beef USA

2008). This signed form is kept on file at the livestock markets as a continuing agreement that all livestock sold by that producer was born in the United States. The livestock market must ensure that a signed form is received from each seller in order to verify compliance if an audit is conducted. In lieu of this signed affidavit, livestock with the 840 individual animal identification compliant ear tags, are automatically deemed to be of U.S. origin, thus there is no need to utilize and maintain signed affidavits. It is anticipated that this new law will benefit the utilization of these 840 tags by livestock producers and will benefit the implementation of the National Animal Identification System.

National Animal identification System Opposition

Opposition to the National Animal Identification System plan was almost immediate by some within the agricultural sector. Websites have been created with the mission of educating producers such that they may work to end the program. Some of those who oppose the program are smaller producers who reside in a special niche markets. Some sell eggs, fresh meats, home-made cheeses directly to customers from their home. The NAIS plan is seen as government intrusion into their lives and will negatively affect their ability to make a living. Some see the program as being granted permission from the government to own and work the land as they see fit.

One commonly held belief by those who oppose the program is that the NAIS is unnecessary. Many feel that current prevention and tracking techniques are working well. In 2008, 3,799,000 calves were vaccinated for Brucellosis within the United States (Donch 2008). The calf crop for the United States in 2008 was 36,112,500 (National Agricultural Statistics Service 2009). This translates into a vaccination rate of 10.5%. This leaves 89.5% of the calves

born in 2008 not vaccinated as well as not individually identified. It must be kept in mind that only female calves are vaccinated for Brucellosis, thus no male calves were individually identified from this program. In 2008 as well, 7,978,000 cattle were blood tested for Brucellosis, 629,100 of these cattle were from farms or ranches (Donch 2008). The bulk of this testing was done at slaughter. Many of these cattle would have only a temporary individual identification via a paper backtag applied by a livestock market. A paper back-tag is not considered a permanent form of identification. The United States Adult Cattle Herd in 2008 numbered near 41,691,000 (National Agricultural Statistics Service 2009). This translates into a testing rate of 15.6%. This leaves 84.4% of the nations adult cattle herd not tested and not individually identified. It is clear that the Brucellosis program is not effective in individually identifying the majority of the cattle within the United States. Thus this program offers little value in traceability due to the low numbers of animals that take part within the program.

In 2008 there were 1,366,186 Tuberculosis caudal fold tests performed within the United States (Orloski 2009). The Adult Cattle Herd in 2008 was near 41,691,000. This translates into only 3.3% of cattle within the United States were tested for tuberculosis. This illustrates that the National Tuberculosis program is ineffective at individually identifying the majority of the cattle within the United States. Thus this program also offers little value in traceability due to the low numbers of animals that take part within the program.

When animal disease outbreaks occur, shortcomings in traceability and response become more easily seen. During the 2007 Avian Influenza incident in West Virginia, it was reported that four employees spent three days visiting 156 residences, 17 of which had birds (West Virginia Department of Agriculture 2007). Only two of those farms had premise identification numbers. The locations of commercial farms were known. The state had no idea about the

location of smaller farms with poultry. As a result, the response to the disease was inefficient & made more difficult since vital personnel had to spend time driving roads looking for premises containing poultry.

During 2007, Virginia also had an Avian Influenza incident involving poultry on one premise. Five Departmental employees spent the better part of one week identifying 32 premises containing poultry. If this had been a larger outbreak, personnel resources would have become limited. By knowing the locations of premises that contain poultry, personnel resources can be more efficiently and effectively used in other areas of the response. The ability to utilize Geographic Information System (GIS) by putting the farms on a map would have provided an efficient, rapid response as well as aid epidemiological investigations.

In 2006, a 10 year old beef cow was diagnosed with Bovine Spongiform Encephalopathy in Alabama. The following is the summary that was recorded at the conclusion of the epidemiological investigation conducted by the United States Department of Agriculture. “Despite a thorough investigation of two farms that were known to contain the index cow and 35 other farms that might have supplied the index cow to the farms where the index case was known to have resided, the investigators were unable to locate the herd of origin. The index case did not have unique or permanent identification, plus, the size and color of the cow being traced is very common in the Southern United States. Due to the unremarkable appearance of solid red cows, it is not easy for owners to remember individual animals. In the Southern United States, it is common business practice to buy breeding age cows and keep them for several years while they produce calves. Most calves produced are sold the year they are born, whereas breeding cows are sold when there is a lapse in breeding, which can occur multiple times in cows’ lives. For all of these reasons, USDA was unable to locate the herd of origin” (United States Department of

Agriculture 2009f). Had this cow been diagnosed with Tuberculosis, Brucellosis or other zoonotic diseases, public health would have been more imminently affected. This case highlights the inability to identify and trace livestock within the United States.

Tuberculosis in cattle is reemerging after being almost eliminated from the nations cattle herds. Since 2002, bovine TB has been detected in Arizona, California, Michigan, Minnesota, New Mexico and Texas. Investigators spent an average of 199 days tracing the sources of animals infected with bovine tuberculosis between October 2005 and August 2007 (Journal of the American Veterinary Medical Association 2009).

Some that oppose the National Animal Identification System believe that it is discriminatory towards community based food systems (Virginia Independent Consumers and Farmers Association 2008). They feel the requirements and infrastructure are prejudicial against small producers and local food systems. They believe that the NAIS will only benefit large corporate agriculture, what they refer to as “factory farming”. Animal disease does not care about the size of the farm the livestock are maintained on. Disease agents will infect livestock on the basis of Host, Agent and Environmental interactions.

Being able to locate premises with animals susceptible to disease(s) that may be in the area is critical to containment and eradication efforts. The premises identification number is established after receiving very basic information (name, address, contact information and species of livestock on the premises). Much of this information can be found in a telephone book or by driving by a producer’s farm. As such, it is not requesting sensitive information. Premises locations can be utilized by Geographic Information System (GIS) technologies to be able to qualify the scope of the livestock disease incident. GIS data can also provide assistance in

quantifying personnel needs. This enables responders to provide an efficient and effective response.

The National Animal Identification System is centered on being able to trace livestock based upon priority designations after they leave their premises of origin. Cattle have been identified as the sole livestock species for which a high priority has been established. Most other livestock species fall into the medium designation which represent species that have adequate tracing systems in place but significant improvement is still possible. Livestock that do not leave the farm, have no need to be individually identified. Only when they are transported to a livestock market or another change of ownership occurs, do they need to be identified. There has been some confusion by many who believe that when an animal is born or an animal dies, then they must make a report to the government. In truth, since no animal left the farm, they do not need to identify the animal nor report the disposition. Producers are encouraged to maintain production records as part of their business. Keeping records is a basic concept in livestock management that will provide investigators useful information if a livestock disease is traced to the farm.

Another common concern voiced in opposition to NAIS is that of cost. Many feel the cost will be prohibitive to smaller farms. The cost issue has two components, that of the identification form itself as well as the ongoing cost of managing the movement information. Ear tags are expected to range from \$1 – 3 per animal. Injectable transponders (microchips) may range up to \$20 per animal (United States Department of Agriculture 2009g) Many producers utilize some form of identification for the animals on their premises already. The typical cost for general use ear tags is approximately \$1 – 3 (Jeffers Livestock Supply 2009). For those who are currently

using ear tags, the cost is not likely to be much more. Those who are using none will see an increase in their cost of production when the animals leave the farm.

The animal tracing component of the National Animal Identification System is perhaps the most daunting of the three stages. Managing the volumes of information that will be collected is not expected to be an easy task. The cost of this portion of the plan has not been fully detailed.

Animal Tracking Databases (ATD) are expected to be managed by private entities or state agencies. As such, some ATDs plan to charge per animal, others may elect to charge per record submitted, and some will not charge anything (United States Department of Agriculture 2009g). Initially when the NAIS plan was drafted, it was intended for the federal government to conduct and maintain the tracing portion of this plan. Due to concerns over protecting privacy via the Freedom of Information Act as well as the desire from the Republican controlled Congress for the private sector to play a role, the tracing component was designed to be a hybridization of government and industry. It is clear that this portion of the plan needs more concrete details to provide information to producers.

Discussion

Since 2004, a total of \$151.1 million has been appropriated by the Federal Government to develop and implement the National Animal Identification System (Government Accountability Office 2007). The program is currently funded, but it is not known how the Obama Administration will view this program. Due to the nation's economic downturn, all federal agencies are having their programs evaluated by the newly appointed Secretaries. It is anticipated however, that the program will continue and at some point be made mandatory.

In the interim, the NAIS program is still being promoted by the United States Department of Agriculture. By the end of 2007, 12 States had registered more than 50 percent

of their estimated number of premises: Idaho, Indiana, Massachusetts, Michigan, Nebraska, Nevada, New York, North Dakota, Pennsylvania, Utah, West Virginia, and Wisconsin. (United States Department of Agriculture 2007). Individual states will continue to implement the components of the program. Cattle, as the high risk species, will continue to see further development of the traceability system. The other livestock species will be gradually addressed as the system is built to accommodate ever increasing numbers of animals.

Problems have been noted with how the NAIS plan was drafted and implemented. In the beginning, participation in NAIS was voluntary but would eventually become mandatory. The plan was later changed to remain voluntary. A robust system can not be built on a totally voluntary system. An expert panel relayed that 81 – 100 % of producers, livestock markets and slaughter facilities would need to register their premises to achieve the programs goal of rapid and effective traceback (Government Accountability Office 2007). The USDA built the NAIS program around a technology neutral framework. The Federal Government would not mandate a specific form of identification for livestock species or a specific system to capture movement data. The USDA provided the framework for the National Animal Identification System - Animal Identification Number, Premise Identification Number and a 48 hour traceability goal. They also provided database standards that serve to promote consistent recording of animal movement information. States are allowed to utilize any identification device that they wish and develop any system for the collection of animal movement data as long as the data contains all necessary information and can be accessed by the USDA within 48 hours. Policy shifts at the national level and poorly conceived initial implementation has created confusion among some within the agricultural sector and slowed program development. No comprehensive cost estimate or cost benefit analysis for implementation and maintenance of the program has been

performed. Cost represents a significant concern for producers, industry groups and states alike. A Cost benefit analysis of the NAIS program was only initiated in 2007. The need for such an analysis was a finding identified by the Government Accountability Office in their evaluation of the program. The results of this study have not yet been published. As the program currently stands, we are better able to identify premises containing livestock than we were before the program began. Approximately 25% of the nation's premises containing livestock have been identified. Individual animal identification is still in its infancy as cattle are the principle species that are currently identified. Traceability has not been tested since the program is still young on a national scale. Currently we are unable to trace livestock any better than we were before the program began. There is still much work to be done in order to accomplish all of the program goals. Individual livestock identification has been practiced for many years within American Agriculture. This was a component of the Tuberculosis and Brucellosis program which are the two largest disease programs involving cattle. Over the years, as these diseases have been reduced from the U.S. fewer livestock are being identified. Many producers may identify livestock for their own record keeping purposes, but this serves no real useful function once they leave the farm. There is no way to tie the identification used to the premises they came from in the event of a disease outbreak that requires tracing of exposed animals.

The NAIS program addresses this issue. In order to be able to purchase individual identification that can be used within this program, a premises identification must first be obtained. In the event of a disease outbreak, investigators can begin a bookend approach to identify the travel history of the animal(s) in question. This approach begins by tracing back when an animal is identified but in addition, the earliest information can be recalled for the animal(s) in question and the investigation can begin on both ends and hopefully will meet in the

middle. This allows for a more rapid investigation into the travel history of the animal(s). Within any disease investigation, time is the ultimate enemy. The faster the process can be completed, the more effective the response.

In 2001, an outbreak of Foot and Mouth Disease (FMD) a highly contagious viral disease, of ruminants and swine, occurred in the United Kingdom (UK) and lasted from February 19 to September 30, 2001. Records show that during the course of this outbreak approximately 10,512 premises were affected and 6,000,000 to 8,000,000 animals were slaughtered (McGinn 2009). In the aftermath of this disease outbreak an inquiry was undertaken to see what lessons could be learned from the governments handling of the disease. The following was noted as one of the important findings. “The Government should develop a comprehensive livestock tracing system using electronic tags to cover cattle, sheep and pigs, taking account of developments at the EU level. The Government should seek to lead the debate in Europe on this issue” (Anderson 2002)

In 2006, a multistate outbreak of *Escherichia coli*, serotype 0157:H7 associated with Consumption of Fresh Spinach was noted (Centers for Disease Control 2006). Following this outbreak the Dole Corporation began exploring the use of Radio Frequency Identification Devices (RFID), Geographic Information Systems and cell phone technologies to track bins of leafy green vegetables (Fresh Cut 2006). If another outbreak should occur, they will be able to trace the source of the infection to the section of the field where the plants were harvested.

In 2008, 43 states experienced an outbreak of *Salmonella saintpaul*. (Centers for Disease Control, 2008). The investigation found that jalapeno peppers and Serrano peppers played a role in the spread of this organism. Tomatoes were considered a possible source of infection early in the outbreak. Due to the initial concern over tomatoes, advisories were made to the public over

the possible contamination of tomatoes. Estimates are that tomato farmers lost \$200,000,000 from this Salmonella scare. This prompted the Commissioner of the North Carolina Department of Agriculture to state that North Carolina needs a better way of tracking back problems related to produce coming into the state (WRAL, 2008).

Within the United States over the past several years, bovine tuberculosis is reemerging among the nations cattle population. It is not known why this disease is making such a rapid return since it was once almost eradicated. Recently North Dakota and Indiana have documented a Tuberculosis identified cow traced to their state but no infected herd has been identified thus far. Many states enjoy Bovine Tuberculosis free status granted by the United States Department of Agriculture. This allows for freedom of movement without testing for the disease.

Tuberculosis is an insidious disease in cattle and the diagnostic test leaves a lot to be desired. It is vitally important in the case of Tuberculosis to be able to track animal movements as it may be potentially be years before an animal is identified. Most of the recent diagnoses of Tuberculosis are occurring at the slaughter plants. From here the animal is traced back to the state they arrived to the plant from. A complete travel (movement) history will need to be conducted on the animal in order to identify all potentially exposed animals and herds they may have come into contact with. Tuberculosis is a public health threat & a resurgence of this disease should be alarming to public health officials. Being able to trace animal movements will be of benefit to animal and human health.

Most people understand and appreciate the value of the E – 911 system. When someone needs police, medical or fire assistance, the best response comes by being able to rapidly respond to the residence in question. The most efficient, cost effective response will be seen when locations are previously identified. Animal Disease is more problematic because of the issue of

disease recognition and spread. Some diseases are more easily recognized grossly than others. If time must be spent to locate premises containing livestock as well as trying to identify movement histories, response activities may be impacted.

The National Animal Identification System was developed for the purpose of identifying premises containing livestock, develop a plan for their identification, and tracing their movement. This is an ambitious plan that will serve to assist in controlling disease outbreaks and assist in minimizing trade repercussions following livestock disease outbreaks. The tracing portion of the plan is still the source of confusion for many. The United States Department of Agriculture needs to clearly identify to livestock producers how this portion of the plan will work as well as its expected cost. The National Animal Identification System may not be a perfect plan, but it is a plan that is needed.

Implications and Recommendations

An effective animal identification program does not exist within the United States. The National Animal Identification System will provide a framework that will allow for identification and tracing of livestock as they move within the U.S. A cost benefit analysis of the NAIS plan is in the process of being conducted. This study will be led by Kansas State University, with assistance from Colorado State University, Michigan State University and Montana State University.

The National Animal Identification System will limit trade repercussions due to an animal disease outbreak. The cow identified in 2003 with bovine spongiform encephalopathy caused the U.S. beef industry to lose more than 80 percent of its export trade, or an estimated \$2 billion, between January and September 2004 (Government Accountability Office 2007). One

goal of a robust animal identification and traceability system is to limit trade restrictions. A growing trend in world trade is one of regionalization. If it can be shown that an animal disease is confined to one section of a country, then animals/animal products in unaffected sections of the country can be marketed. This will limit an outright trade ban. This however will always be subject to geopolitical considerations which are difficult to gauge.

Alternative methods to allow for identification and tracing of livestock on a national scale have not been identified. Due to the money and time spent on the current NAIS program, it is difficult to see the program not continue. In order to be effective the program will need to be made mandatory. The American people will need to unite in order for this program to be implemented on the scale necessary for its success. Ultimately the Obama administration will decide the future of this program.

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