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Factors Influencing Support for a National Animal Identification System for Cattle in the United States

By

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Abstract

Factors Influencing Support for a National Animal Identification System for Cattle in the United States

A survey of state veterinarians and leaders of state cattle producer associations was conducted in January 2004 to identify the determinants of support for animal ID programs in the US. The results indicate strong support for implementing some form of animal ID program, but that only about 40% of cattle association leaders supported a specific plan called the USAIP. The results suggest that familiarity with the USAIP, a perception that producers will share net benefits equally with other downstream firms, and whether or not a respondent was from a state requiring cattle to be branded were significantly related to the level of support a respondent indicated for the USAIP.

Key Words: *Animal identification, USAIP, NAIS, BSE*

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Introduction

The announcement on December 23, 2003 that a dairy cow in the state of Washington had been diagnosed with *Bovine Spongiform Encephalopathy* (*BSE* or Mad-Cow Disease) was a watershed event for US livestock markets. Although US consumer demand for beef appeared to remain strong in the weeks following this event, the US beef industry and US government recognized the need to move rapidly forward with plans to implement some type of traceability in US livestock systems. For example, Agricultural Secretary, Ann Veneman, has announced that USDA plans to begin implementing a "verifiable" animal identification (ID) system in the United States.

An identification system capable of tracking cattle as they move through the food chain is necessary in light of *BSE*. This is true because traditional food safety systems were designed assuming that the most risk of food-borne illness from beef was from bacterial contaminations such as with *E. coli* O157:H7 or listeria, not *BSE*. Because the greatest risk for bacterial contamination has typically been in the processing and preparation of meat for human consumption, government food inspections have traditionally concentrated on identifying bacterial contamination in food processing plants and at the food preparation level such as in restaurants. *BSE* is a fundamentally different problem than bacterial contamination. Because *BSE* is believed to originate with contaminated feed produced from the by products (spinal cord and brain material) of infected cattle, it is a problem that originates at the farm level. The current US system was not designed to routinely track individual or groups of animals once they leave their farm or ranch of birth. Cattle are typically commingled from different locations to facilitate grazing and feedlot fattening for slaughter. Long incubation periods for *BSE* make it so symptoms of the disease typically do not express themselves until the animal is over 30

months of age. At this age, the animal likely has changed ownership a number of times. For example, cattle usually have had 5-6 different owners between the time they are born and eventually slaughtered. Once an animal with *BSE* has been identified, the ability to track the animal backward through the system becomes critical because companion animals may also be infected and because the sources of feed the animal has had during its lifetime must be identified.

The implementation of an animal ID system in the US will depend on the cooperation of state departments of agriculture and specifically state veterinarians since the programs proposed by the USDA specify that states will be responsible to define premises. State departments of agriculture will likely also be involved in issuing identification numbers. The involvement and support of producer groups is important since producers will bear costs associated with implementing the program and will also need to offer significant political support to persuade the US government to cover all are part of the costs of such a program (NAIS).

This paper reports the results of an email and telephone survey of state veterinarians and representatives from state cattle producer associations about their attitudes and concerns concerning the implementation of a national animal ID system. The survey was conducted immediately following the US *BSE* announcement during the last week of December 2003 and the first three weeks of January 2004. Responses to the survey found general support for implementing an animal ID system in the US, although weaker support was expressed for a specific proposed plan called the US Animal Identification Plan (USAIP). Support for the USAIP was the issue examined in this research because it was the program being considered by the USDA and the US livestock industry at the point in time the research was conducted. The USAIP also continues to remain the central blueprint of the updated ID plan currently propsed by the USDA, Animal, Plant Health Inspection Service (APHIS).

The research results also indicate a perception exists that not all levels of the food chain are expected to benefit equally from the implementation of an animal ID system. In general, producers believe they will benefit less than processors and foreign and domestic consumers. A majority of respondents also believe that the USAIP could be expanded to facilitate country-of-origin labeling (COOL).

Evolution of Animal Identification Programs in the US

The National Identification Work Plan (NIWP) was the first official public effort in the US to examine the possible implementation of a US animal ID system. The NIWP was developed by a task force formed in April 2002 consisting of over 30 livestock organizations and was coordinated through the National institute for Animal Agriculture. The US Animal Health Association (USAHA) accepted the NIWP in October 2002 and requested that USDA, APHIS develop a team consisting of representatives from federal and state governments, USAHA, and industry to develop an implementation plan for animal ID systems in the US (NIWP).

The working plan for the implementation of the animal ID system as suggested by the NIWP is called the USAIP. The USAIP was approved by the USAHA in October 2003. The USAIP called for the establishment of individual premises ID by the summer of 2004, individual animal identification by 2005, and full implementation and compliance (all covered species and their movements - both interstate and intrastate) by July of 2006. The USAIP also established a unifrom and nationally recognized numbering system for individual animals and for groups or lots of animals. The stated goal of the USAIP was to facilitate traceback within 48 hours where traceback is defined as being able to trace an animal to various locations it has been located in between birth and when the traceback was initiated (USAIP).

Support for the USAIP in the US livestock industry began to build following the discovery of *BSE* in Canada (Alberta) in May 2003 and became quite general among US livestock producer groups after December 2003 (e.g., Breckendorf (2004); Lyon (2004); Denis (2004); Philippi (2004); and Smith (2004)). This apparently high level of support enjoyed by the USAIP after December 2003 belied much of the discussion prior to May 2003 surrounding the possible implementation of animal ID and traceability systems in the US meat system. Prior to 2003, discussions about animal ID and traceability systems centered on market solutions and specifically on the ability of firms to recapture costs incurred in implementing these systems (see Wiemers (2001); Buhr; Sparks; Dickinson and Bailey (2002) and (2003); and Bailey, Jones, and Dickinson).

The announcement in December 2003 regarding the Washington state *BSE* case has placed traceability in a prominent position in the US food policy debate as efforts are made to establish a national animal ID system (Farm Foundation). Since December 2003, the USAIP has evolved into what is now called the National Animal Identification System (NAIS). Most of the essential elements of the USAIP remain the same in the NAIS. Most importantly, the USAIP blueprint relating to standards for data and data flows within the animal ID system remain the same. This includes the numbering system developed by the USAIP.

Perhaps the most significant difference between the USAIP and the NAIS is that the NAIS eliminated radio frequency identification (RFID) is the stated standard for gathering information from individual animals or lots of animals. The reason for doing relates to the USDA's desire to be "tech neutral" in its policies relating to animal identification (Collins; NAIS). That is, USDA does not wish to mandate a technology for identifying animals preferring rather to allow market forces to select the appropriate technology in specific situations. Basically, the NAIS establishes

standards for the form and handling of data but does not establish a standard for ear-tags or other identification devices for individual animals and also does not establish how information will be gathered from the individual animal ID devices (Wiemers (2004)).

Prior to December 2003, the full implementation costs for the USAIP were estimated to total over $500 million for the first six years of the program. The precise plan for how these costs would be shared between the public and private sectors was not defined in the USAIP, although some funding for the first year of the Project had been requested from the Commodity Credit Corporation (USAIP, pp.47-48). As a result, USAIP was a plan that did not initially have a clear format for how the full cost of its implementation would be funded.

USDA, APHIS received a transfer of $18.8 million from the CCC during fiscal year (FY) 2004 and President Bush's budget for FY 2005 requests $33 million for animal ID. During FY 2004, APHIS plans to spend this money to establish cooperative agreements that will assist implementing animal ID, establish a national premises allocator and repository to begin allocating premises identification numbers, and identify and qualify third parties that have ID technology and products so that they can be integrated into the national system (NAIS). The USDA is initiating the program on a voluntary basis although it may become mandatory over time as the system becomes fully functioning (Collins).[1]

Other Issues Relating to Animal Identification Systems

The NIWP, USAIP, and the NAIS have focused on issues of animal health as an impetus for implementing animal ID. For example, all three plans indicate that, "Maintaining the health of the US herd is the most urgent issue of the industry and animal health officials to address, and therefore, is the most significant focus of the National Identification Plan" (USAIP, NAIS;

[1] One recent study indicated that 69% of US consumers responding to a survey would prefer mandatory animal ID over voluntary animal ID (Ward, Bailey, and Jensen).

National Food Animal Identification Task Force, p. 3). However, at the time the NIWP was first being considered, traceability systems that included animal ID as part of the system had been developed or were in the process of being developed in a number of countries that were either principal competitors or customers of the US in global meat trade. These included the European Union (EU), Canada, Japan, Australia, and New Zealand (Hobbs (1996a) and (1996b); Liddell and Bailey).

Several economic studies have suggested that there may be important economic reasons for adopting animal ID systems besides animal health. Animal ID is an essential component of traceability and these studies have suggested that credence characteristics that can be certified with traceability are valuable to some consumers (e.g., Hobbs (1996a) and (1996b); Bailey and Dickinson (2002) and (2003)).[2]

The rise of dichotomous systems in world meat markets , i.e., those systems with animal ID (traceability) and those without was clearly driven by the emergence of *BSE* as a threat to meat markets but is also being used as a strategy to differentiate products (Bailey, Jones, and Dickinson). The existence of different systems has led to significant frictions in trade. For example, the EU's requirements for traceability and labeling have led recently to threats by the US to take the issue to the World Trade Organization as a non-tariff trade barriers that have no scientific basis (Clapp). Consequently, market considerations are important when considering the implementation of animal ID programs even though they were not the primary emphasis of the NIWP or the USAIP.[3]

[2] Examples of potentially valuable meat characteristics that could be certified using traceability include assurances about human animal treatment, environmental responsibility, and social responsibility.

[3] "Off-the-record" discussions with persons close to the NIWP and the USAIP indicate that consensus to support these plans within their working groups could only be achieved if the emphasis remained on animal health as the reason for developing animal ID systems.

Other important issues remain relating to how the benefits and costs of animal ID will be shared in the new system. For example, although total exposure to liability for the marketing chain will not change with animal ID, how liability is allocated within the chain may shift in the direction of farmers and rancher because they will no longer be anonymous participants in the chain after their cattle are sold (Roberts and Pittman). Questions also remain about the confidentiality of information gathered in a national animal ID system. While the information will likely be classified as being a critical infrastructure for Homeland Security, it is still not clear whether or not the data could be obtained through court subpoena (Farm Foundation). Consequently, producer support for a national ID system is probably influenced by how they perceive these and other issues might affect the costs and benefits they would experience from such a system.

Modeling Support for the USAIP

The analysis conducted in this paper examines the level of support among 1) those who will have major responsibilities for implementing and overseeing the US animal ID system (state veterinarians) and 2) representatives of producer groups because producers will likely bear significant costs for implementing the program (Sparks).[4] An examination of how support for a specific animal ID proposal (USAIP) varied based on concerns about animal health and the perceived costs and benefits accruing to different levels of the marketing chain is also reported.

Support or non-support for the implementation of an animal ID program in the US should be based on the net benefits producer groups perceive they would receive from the program and also their underlying utility functions. Greene (p. 668) suggests that in cases where only action

[4] Another study estimates the cost to producers for an electronic ID system for cattle could vary from over $24/head to about $4/head, depending on the size of operation (Blasi et al.).

or inaction are observable[5] that an index function model is appropriate to explain the probability of, in this case, support or non-support for the USAIP. This assumes that survey respondents base support or non-support for the USAIP based on their own "marginal benefit-marginal cost calculation based on the utilities achieved" by supporting or not supporting the program (Greene, p. 668). The difference between benefit and cost is modeled as an unobservable index variable, y^*, in the following form (Greene, p. 669):

(1) $y^* = x'\beta + \varepsilon$

where x and β are vectors of explanatory variables and parameter estimates, respectively, and $x'\beta$ is referred to as the index function. Green assumes that the disturbance term, ε, can be distributed either logistically or normally (p.669). Because one can only observe whether a survey respondent either supports or does not support the USAIP (i.e., the net benefits are not observable) then the observed choice is assumed to be

(2) $y=1$ if $y^* > 0$ and $y=0$ if $y^* \leq 0$

The assumption of normality or a logistical distribution for the error term is what Greene refers to as "innocent" because the actual variance is unknown but if known a normalization would leave the data (y and x) unchanged (p. 669). Greene also indicates that the assumption of a threshold of 0 for y^* requires that a constant term be included the latent regression.[6] Greene demonstrates that if the distribution of the error term is symmetric then

(3) $\text{Prob}(y^* > 0 \mid x) = \text{Prob}(\varepsilon < x'\beta \mid x) = F(x'\beta)$.

[5] The example cited by Greene is the purchase or non purchase of an expensive item.

[6] Greene (p. 669) refers to this as latent regression because the marginal cost and benefits are being observed only indirectly through the choice to support (y=1) or not support (y=0).

Greene also indicates that a logit or probit model may be used to estimate these probabilities. We assume that the disturbances follow a normal distribution and so a probit model is used to complete our analysis (p. 670).[7]

Separate electronic surveys were sent to state veterinarians in all states[8] and 45 state cattle[9] producer associations in the United States.[10] Unfortunately, only seven state veterinarians and 11 producer associations responded to the electronic surveys. Follow up telephone interviews were able to obtain responses from an additional 23 producer associations.[11] This yielded a total of 34 completed responses from leaders of state cattle producer associations. Two responses were received from Arizona and Colorado, but were completed by different persons[12] and so both responses are included in the dataset. Missing values for some explanatory variables left 27 useable surveys that were used to complete the regression analysis for state cattle producer associations. Because only seven responses were received from state veterinarians, these responses are reported only as frequencies and are not used in the probit model because of a degrees of freedom problem. Also, all of the state veterinarians responding to the survey supported the USAIP which made estimating the probit model for them impossible. A list of survey questions and response frequencies for the state veterinarians is found in Table 1. Survey questions and response frequencies for the producer association survey are found in Table 2.

The explanatory variables for the probit (x) for support or non-support of the USAIP by respondents from state cattle producer associations were assumed to be the following:

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[7] A logit model yielded very similar results to the probit model.
[8] State veterinarian lists are available from several sources on line, e.g., http://www.vhdcoalition.org/vhdstvet.html
[9] Surveys were also sent to swine, sheep, bison, and elk producer associations but are not reported here. The focus of the study is on cattle because cattle represent the largest US livestock industry and because support for animal ID programs has been more mixed for cattle producers than other types of livestock.
[10] Contact information for 45 state cattle producer associations was available on the beef.org web site.
[11] Additional follow up telephone interviews with state veterinarians will be done but were not completed at the time this paper was written.
[12] This assumption is based on responses being different for the two surveys received from these states.

(4) x = *FAMUSAIP*, *SPEED*, *INTMARK*, *SUPCATT*, *FARMPROC*, *FARMRET*, *COOL*, *BRAND*, *SIZE*, *SURVEY*

where the respondent's familiarity with the proposed provisions of the USAIP is *FAMUSAIP*, whether or not he/she believed the timetable for implementation of the USAIP was too optimistic or not (*SPEED*). *FAMUSAIP* and *SPEED* would both be expected to have positive signs because familiarity with the USAIP and wishing to have it implemented quickly should both contribute to the probability that the respondent supported the USAIP. Respondents were also asked how effective the USAIP would be in addressing animal disease control and eradication (*ANDISEAS*), and concerns about maintaining international markets (*INTMARK*).[13] Both ANDISEAS and *INTMARK* should have positive coefficients since both controlling animal disease and maintaining international markets for beef would be expected to have positive impacts on producers. The percentage of cattle producers the respondent believed supported the USAIP in his/her respective state (*SUPCATT*) was expected to have a positive impact on the probability that the respondent supported the USAIP.

The perceived difference in potential net benefits respondents between farmers and ranchers and processors as a result of the USAIP being implemented (*FARMPROC*)[14] was included in the regression as was the difference in benefits respondents perceived between farmers and ranchers and food retailers (*FARMRET*).[15] If respondents believed that animal ID would yield higher net benefits to segments of the marketing chain downstream from farmers than they would to farmers, the probability the respondent supported the USAIP likely

[13] Concerns about the domestic market (*DOMMARK*) were also included in the initial regressions, but were found coincidentally to be highly collinear with the level of producer support in the state (*SUPCATT*). Consequently, *DOMMARK* was dropped from the regression.
[14] *BENFARM – BENPROC*.
[15] *BENFARM – BENRET*.

decreased. Consequently, the sign for both *FARMPROC* and *FARMRET* was expected to be negative.

It is possible that country-of-origin labeling (COOL) in the US could be included as part of the implementation of an animal ID program. Consequently, respondents to the cattle producer association survey were asked if they believed the USAIP should be expanded to include COOL (*COOL*). *COOL* could have had a positive (negative) influence on support (non-support) for the USAIP if respondents believed that the USAIP could/would be used to implement COOL and they supported (didn't support) the implementation of COOL. As a result, the expected sign for *COOL* was uncertain since an *a priori* expectation of the sign regarding the support for COOL by state cattle producer associations was unknown.

Some states require that cattle be branded while other states do not (*BRAND*). Many producers in branding states believe that branding might be a sufficient form of animal ID since it designates the farm of origin for cattle and that brand inspection tracks the movement of cattle across states. This might affect support for imposing a seemingly added, and perhaps unnecessary, form of ID requirement in these states. *BRAND* is included as a binary variable in the regression (equal one for states requiring branding and zero otherwise) and the sign for *BRAND* was anticipated to be negative.

At least one study has found that substantial economies of size exist in implementing animal ID at the farm or ranch level (Blasi et al.). Average beef herd size for each state was calculated by dividing the total beef cow inventory by the number of beef cattle producers (*SIZE*). Consequently, *SIZE* was a continuous variable that was included in the probit analysis. The sign of the parameter estimate for *SIZE* was expected to be positive because the per unit cost

of implementing the USAIP would have been lower, on the average, for states with relatively large average individual herd sizes compared to states with smaller average herd sizes.

Because part of the cattle producer association surveys were collected electronically and part by telephone interview, a binary variable was included in the model (*SURVEY*) to correct for any difference in the probability of supporting the USAIP because responses were either obtained electronically or collected by telephone.[16] One might expect that respondents answering the electronic survey before being telephoned would have stronger opinions about the USAIP than those not initially responding to the electronic survey. However, no *a priori* expectation about the sign of *SURVEY* is possible.

Results

Each state veterinarian responding to the survey expressed support for the USAIP (Table 1). All but one of the vets also believed that the livestock industry in their state supported the USAIP (question 9 in Table 1). The state veterinarians also seemed to believe that animal ID was essential (in order based on mean response score) for purposes of dealing with *BSE*, bio-security, animal health, and, finally, addressing consumer issues (question 11 Table 1). Support for the USAIP from state veterinarians is not surprising considering the emphasis the plan places on animal health issues and the central role state departments of agriculture and state veterinarians will play in the implementation of any national animal ID program.

While over 90% of state cattle producer association respondents indicated support for a national cattle ID program (question 1 in Table 2), only 41% indicated that they supported the USAIP. This may help to explain why the USAIP has continued to evolve as producer groups have applied pressure politically to add more flexibility to the national animal ID plan.

[16] *SURVEY* was equal to one if the responses were obtained electronically and zero otherwise.

The desire for flexibility in implementing traceability systems, such as animal ID, has been a constant theme with US agribusiness firms when discussing issues relating to traceability. Farm Foundation reports that US agribusiness firms would prefer market solutions rather than government regulation and mandates when traceability systems are implemented, except in the case of life-threatening food safety concerns. Table 3 reports mean responses from the cattle producer association survey for both USAIP supporters and non-supporters. While the mean responses for supporters tended to be higher for most questions than for non-supporters, both supporters and non-supporters ranked the maintenance of international markets as the most important reasons for implementing the USAIP.[17] This is contrasted with the mean responses from the state veterinarians who ranked consumer issues fourth, based on the mean response, as the most important reason for implementing the USAIP (question 11 in Table 1). This may help explain why the support for the USAIP varies between state veterinarians and producer groups. State veterinarians see animal ID principally as an animal and public health issue while state producer associations place at least an equal weight on market issues as they do health issues as reasons for implementing animal ID. Veterinarians would be expected to support the implementation of standardized programs that safeguard animal and human health because this is their area of responsibility. Conversely, would be expected to be most concerned about implementing flexible system that can adjust to market conditions.

Fewer supporters of the USAIP believed that COOL should become part of the program than did non-supporters (*COOL*) and a higher proportion on non-supporters were branding states than were those supporting the USAIP (*BRAND*) (Table 3). However, only the responses for *FOODSAF* and *INTMARK* were statistically larger for supporters than for non-supporters. This suggests that supporters of the USAIP had a more positive perception of the USAIP from the

[17] The mean response for *ANDISEAS* was identical to *INTMARK* for non-supporters of the USAIP (Table3).

perspective of food safety and preserving international markets than did non-supporters, on the average. In fact, the results suggest that the most positive feelings non-supporters have about the USAIP are from the perspective of animal disease control and eradication (*ANDISEAS* in Table 2). This may help explain why the national effort to develop an animal identification plan continues to build consensus for implementing animal ID by focusing on animal disease control issues.

The parameter estimates and marginal effects for the probit model are reported in Table 4. All signs met *a priori* expectations with the exception of *SPEED* which had a statistically insignificant negative parameter estimate. The results indicate that when these key explanatory variables are taken as a whole, the respondent's familiarity with the USAIP (*FAMUSAIP*), his/her perception that processors would benefit more than producers from the USAIP (*FARMPROC*), and if respondent's state required branding or not (*BRAND*) had statistically significant influences on the probability that he/she supported the USAIP.

The results suggest, not surprisingly, that education about proposed animal ID programs is an important component of gaining support for the programs (*FAMUSAIP*). For example, the marginal effect of *FAMUSAIP* suggests that a person considering themselves to be "very" familiar with the USAIP (a score of 4 for question 2 in Table 2) would be almost 35% more likely to support the USAIP than a respondent that was only "quite" familiar with it (score of 3 for that question). The USDA can provide an important role in publishing material about these programs in paper or electronic formats. The academic community also needs to be active in providing extension programming to help producers understand the different provisions of proposed programs, the strengths and weaknesses of the proposals, and the costs and benefits associated with different animal ID programs.

If respondents perceived that processors (packers) would benefit more from the USAIP than for farmers and ranchers (*FARMPROC*), he/she was less likely to support the USAIP than if he/she perceived no difference in benefits between producers and processors. This illustrates that many producers see costs and limited benefits from animal ID while believing that most of the benefits will be captured by downstream firms. The respondents seemed to understand the health issues (both animal and human) associated with animal ID and also the potential positive impact on international markets (Table 3), all of which should offer direct or indirect benefits to producers. Issues relating to the potential shift in liability in the marketing chain toward producers as a result of animal ID are often brought up by producers when discussing traceability issues (Farm Foundation; Roberts and Pittman). This might explain this result because perceived shifts in liability away from packers and toward farmers would likely reduce producer support for animal ID programs. This suggests that issues relating to how liability will be shared or limited in the marketing chain after the implementation of animal ID need to be addressed (Farm Foundation).

The parameter estimate for *BRAND* is negative and significant but the marginal effect for *BRAND* falls just out of the significant range (p-value = 0.1054). In either case, there is the results provide evidence that being in a branding state influenced support for the USAIP (Table 4). While branding and brand inspection do provide a system for tracking cattle between states that require branding, they do not provide tracking when movements are intrastate or when cattle move from a branding state into a state without a requirement for branding. Thus, reliance on branding alone would leave significant “holes” in a national cattle tracking system. Most branding states are also located in the West where cattle operations tend to range over larger geographic areas than in other parts of the country potentially making tracking animals more

difficult. The fact that the marginal effect for *BRAND* indicates that respondents from branding states had a 64% higher probability of not supporting the USAIP than did respondents from non-branding states, suggests that educational efforts need to explain why branding may be an inadequate method on which to base a national animal ID program.

Summary and Conclusions

The announcement of a *BSE* case in the state of Washington in December 2003 was a watershed event for the US cattle industry. The USDA moved quickly after this discovery to announce that a verifiable animal ID system would be implemented in the US. An animal ID system had been in the planning stages in the US for about 18 months when December 2003 arrived, but the discovery of *BSE* brought the discussion about the implementation of an animal ID system to the political forefront. The USAIP was the version of animal ID that was being considered at the time the *BSE* crisis erupted and remains the basic blueprint for the NAIS.

This paper presents the results of a survey of state veterinarians and leaders of state cattle producer associations about their support for a national animal identification system and, specifically, the USAIP. The results demonstrate that while strong support exists for the implementation of a national animal ID system among all respondents, that much weaker support was expressed for the USAIP by cattle producer associations than by state veterinarians. In fact, the small sample of state veterinarians expressed unanimous support for the USAIP while only slightly more than 40% of the state cattle producer association leaders surveyed supported the USAIP. Our results suggest the reason for this disagreement exists because veterinarians see the role of the USAIP as being principally related to maintaining animal and human health while producer associations are also worried about the market implications related to the implementation of the USAIP.

The results demonstrate that education about animal ID programs increases the probability that they will receive support. The results also suggest that emphasizing the need for animal ID systems from the perspective of animal and human health and the need to preserve international markets for US beef are appropriate strategies to gain the necessary political support for these programs.

Few issues in the US livestock industry in recent years have been more controversial than animal ID. Significant barriers remain to be crossed before animal ID is implemented on a national basis in the US. For example, issues relating to how liability will be shared or limited in a system with animal ID and how costs of implementing animal ID will be allocated remain to be addressed. Questions about which technology or technologies will be used in a national animal ID system and how these technologies will interface in transferring information to a national database also need to be resolved. Despite these challenges, animal ID offers opportunities for controlling animal diseases, standardizing beef trade in world markets, and expanding niche market opportunities to beef producers. Consequently, although the precise form in which animal ID will be implemented in the US remains somewhat cloudy, a significant commitment on the part of industry and government currently exists that has not existed in the past. This commitment should provide the ability to overcome the apparent obstacles standing in the way of implementing animal ID in the US.

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Table 1. Survey Questions and Responses from State Veterinarians.

Question	Possible Responses	Response/Frequency
Total Responses = 7		
1. Are you in favor of a national ID program for cattle, swine, sheep, bison and elk?	Yes/No	7/Yes 0/No
2. D you support the USAIP as now written?	Yes/No	7/Yes 0/No
3. Will electronic health certificates be feasible in your state immediately after USAIP is implemented?	Yes/No	5/Yes 2/No
4. Should Brucellosis vaccination tags be eliminated with the implementation of USAIP?	Yes/No	4/Yes 3/No
5. Should the USAIP be used to institute COOL?	Yes/No	4/Yes 3/No
6. Should the USAIP be used to track change of ownership only?	Yes/No	4/Yes 3/No
7. Should the USAIP track pasture-to-pasture movements by the same owner?	Yes/No	1/Yes 6/No
8. Is it necessary to know which animal is on both sides of a fence at a given time?	Yes/No	4/Yes 3/No
9. Do the livestock industry in your state support the USAIP?	Yes/No	5/Yes 1/No

Table 1. Continued.

Question	Possible Responses	Response/Frequency	
10. Does your state department of agriculture support the USAIP	Yes/No	7/Yes 0/No	
11. How essential is the USAIP for each of the following pieces of information:			**Mean = 4.43**
Animal health?	1 – Not essential at all to 5 – Absolutely essential	1/0 2/0 3/1 4/2 5/4	
Consumer issues?	1 – Not essential at all to 5 – Absolutely essential	1/0 2/0 3/3 4/3 5/1	**Mean = 3.71**
Bio-Security?	1 – Not essential at all to 5 – Absolutely essential	1/0 2/0 3/0 4/2 5/5	**Mean = 4.71**
BSE?	1 – Not essential at all to 5 – Absolutely essential	1/0 2/0 3/0 4/1 5/6	**Mean = 4.86**
12. What effect, if any, will diverse state-by-state interpretations of the premise ID number have on the management of the USAIP?	1 – No effect at all to 5 – Significant effect	1/0 2/0 3/1 4/1 5/4	
13. States responding to the survey	KY, MD, MI, NC, SC, UT		

Table 2. Survey Questions and Responses from State Producers' Associations.

Question	Possible Responses	Response/Frequency	Variable Name
Total Responses=34			
1. Do you favor a national ID plan for cattle?	Yes/No	Yes/32 No/2	*NATID*
2. How familiar are you with the different aspects of the USAIP?	1 – Not familiar at all to 5 – Completely familiar	1/1 2/6 3/14 4/8 5/4	*FAMUSAIP*
3. Do you support the USAIP as now written?	Yes/No	Yes/14 No/20	*SUPUSAIP*
4. The USAIP calls for the establishment of premises ID by the summer of 2004, individual animal ID by 2005, and full implementation and compliance by 2006. Do you believe this timetable is	1 – Far too optimistic to 5 – Must be accelerated	1/6 2/8 3/11 4/2 5/3	*SPEED*
5. How effective do you believe the USAIP will be in addressing issues for cattle related to			
Animal disease control and eradication?	1 – Not effective at all to 5 – Extremely effective	1/1 2/7 3/8 4/12 5/4	*ANDISEAS*
Concerns about food safety?	1 – Not effective at all to 5 – Extremely effective	1/6 2/6 3/9 4/7 5/2	*FOODSAF*

Table 2. Continued.

Question	Possible Responses	Response/Frequency	Variable Name
Concerns about food quality?	1 – Not effective at all to 5 – Extremely effective	1/9 2/8 3/9 4/4 5/2	*FOODSAF*
Concerns about maintaining international markets?	1 – Not effective at all to 5 – Extremely effective	1/1 2/3 3/7 4/17 5/3	*INTMARK*
Concerns about maintaining domestic markets?	1 – Not effective at all to 5 – Extremely effective	1/2 2/6 3/10 4/10 5/3	*DOMMARK*
6. In your opinion, what percentage of cattle producers in your state support the USAIP?	Fewer than 10% 10%-25% 25%-50% 50%-75% Over 75% Don't know	/2 /6 /13 /4 /5 /4	*SUPCATT*

Table 2. Continued.

Question	Possible Responses	Response/Frequency	Variable Name
7. How much do you believe each of the following groups will benefit if the USAIP is implemented?			
Farmers and Ranchers?	1 – No benefit at all to 5 – Great deal of benefit	1/4 2/7 3/10 4/7 5/5	*BENFARM*
Food processors/ packers?	1 – No benefit at all to 5 – Great deal of benefit	1/4 2/9 3/9 4/6 5/5	*BENPROC*
Food retailers (grocery stores)?	1 – No benefit at all to 5 – Great deal of benefit	1/6 2/9 3/11 4/3 5/3	*BENRET*
Restaurants and other food service?	1 – No benefit at all to 5 – Great deal of benefit	1/7 2/5 3/12 4/3 5/3	*BENREST*
Domestic consumers?	1 – No benefit at all to 5 – Great deal of benefit	1/4 2/6 3/13 4/5 5/4	*DOMCONS*

Table 2. Continued.

Question	Possible Responses	Response/Frequency	Variable Name
Foreign consumers?	1 – No benefit at all to 5 – Great deal of benefit	1/5 2/5 3/11 4/10 5/1	*FORCONS*
8. Do you believe that the USAIP should be expanded to make COOL possible?	Yes/No	Yes/20 No/13	*COOL*
9. Is branding required in the state?	Yes/No	Yes/14 No/20	*BRAND*
States participating in the survey	AL, KY, IN, MT, AZ (2), NE, NV, NY, OH, WV, ME, CO (2), UT, OK, VA, ID, FL, MO, IA, NC, GA, WY, NJ, KS, PA, IL, CA, TN, NM, MI, TX, plus one unknown respondent		

Table 3. Average Responses and Test for Statistical Differences Based on Support or Non-Support of the USAIP.

Variable	Value for Supporters	Value for Non-Supporters	Statistical Difference (Y/N)[a]
FAMUSAIP	3.36	3.25	N
SPEED	2.78	2.33	N
ANDISEAS	3.64	3.30	N
FOODSAF	3.21	2.47	Y
FOODQAL	2.57	2.37	N
INTMARK	4.00	3.30	Y
DOMMARK	3.21	3.21	N
SUPCATT	3.07	2.55	N
BENFARM	3.21	2.95	N
BENPROC	3.36	2.75	N
BENRET	2.93	2.60	N
BENREST	2.79	2.56	N
DOMCONS	3.14	2.90	N
FORCONS	3.14	2.85	N
COOL	0.50	0.68	N
BRAND	0.29	0.55	N
FARMPROC	-0.14	0.20	N
FARMRET	0.28	0.35	N
SIZE	45	51	N

[a] "Y" indicates statistical difference in the means at at least the 10% level of confidence.

Table 4. Parameter Estimates for Probit Model Together with Marginal Effects.[a]

Independent Variable	Parameter Estimates	Marginal Effects
Intercept	-7.510*	-2.830**
	(4.16)	(1.411)
FAMUSAIP	0.920*	0.347*
	(0.565)	(0.210)
SPEED	-0.199	-0.074
	(0.386)	(0.138)
ANDISEAS	0.257	0.097
	(0.650)	(0.245)
INTMARK	0.889	0.335
	(0.829)	(0.305)
SUPCATT	0.371	0.140
	(0.438)	(0.163)
FARMPROC	-0.753*	-0.284*
	(1.079)	(0.422)
FARMRET	-0.032	-0.012
	(0.408)	(0.154)
COOL	-0.337	-0.127
	(0.775)	(0.294)
BRAND	-1.703*	-0.642*
	(1.019)	(0.396)
SIZE	0.184	0.007
	(0.013)	(0.005)
SURVEY	-0.730	-0.275
	(1.200)	(0.447)

[a] Standard errors are in parentheses.
* Denotes statistically different than zero at the 10% level of confidence.
** Denotes statistically different than zero at the 5% level of confidence.