

Response of North Dakota Lamb and Wool Producer Association members to the National Animal Identification System Strategic Plan (NAIS)

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This study evaluates responses that North Dakota Lamb and Wool Producers Association members had to the release of the National Animal Identification System Strategic Plan (NAIS). Overall, 27% of NDLWPA respondents recommend the continuation of the scrapie tag program for animal identification purposes; 8% recommended implants; 8% recommended eliminating identification programs; and 27% did not provide recommendations. A third of the respondents did not specify a type of identification but provided recommendations for how the system should be implemented.

Introduction

This study surveyed members of the North Dakota Lamb and Wool Producers Association (NDLWPA) following the release of the National Animal Identification System Strategic Plan (NAIS). Members of NDLWPA were asked their perceptions of USDA-APHIS, the National Animal Identification System, RFID technology, and the role of the North Dakota Lamb and Wool Producers Association. In addition, in order to compare the study with the previous survey of the North Dakota Stockmen's Association (NDSA), questions were asked regarding ownership of cattle and membership in NDSA.

Procedures

Conducting research as an innovation is being diffused can provide insight into the motivations for adopting or rejecting an innovation (Rogers, 2003). Rather than surveying participants after an innovation has been accepted, as is common in diffusion research, this study surveyed members of the North Dakota Lamb and Wool Producers Association (NDLWPA) following the release of the National Animal Identification System Strategic Plan (NAIS). Members of NDLWPA were asked their perceptions of USDA-APHIS, the National Animal Identification System, RFID technology, and the role of the North Dakota Lamb and Wool Producers Association. In addition, in order to compare the study with the previous survey of the North Dakota Stockmen's Association (NDSA), questions were asked regarding ownership of cattle and membership in NDSA.

Questionnaires have been used extensively in diffusion studies (Rogers, 2003). Questionnaires have also been used effectively to study risk perception and behavior related to the diffusion process (Singhal & Rogers, 2003). At the North Dakota Lamb and Wool Producers Association Annual Meeting in December 2006, open-ended questionnaires were distributed to attending members to learn their perceptions of the adoption or rejection process of RFID technology. The method was naturalistic (Lincoln & Guba, 1985) in that the researcher adopted "strategies that parallel how people act in the course of daily life" (Taylor & Bogdan, 1998, p. 8). Participants were already attending the meeting, and panels had already been scheduled during the meeting to discuss NAIS, allowing for an environment in which the participants would feel comfortable revealing related information (Taylor & Bogdan, 1998). The study was authorized by the North Dakota State University Institutional Review Board.

Participants

Participants were selected based on their attendance at the NDLWPA Annual Meeting. The participants were all adults and members of NDLWPA. Participation in the survey was voluntary, and the decision about whether to participate in the study did not affect the standing of the participants in NDLWPA. If individuals decided not to participate, they were free not to complete the questionnaire or to stop at any time. Those participating in the survey signed an informed consent form allowing the information to be studied. Of the 95 attendants, 26

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participants returned questionnaires for a 27% response rate. All 26 respondents were sheep producers, however, 1 listed university and 1 listed marketing agent as additional industry affiliations. Producers were classified by length of time in the industry; 2 had been farming for under 10 years, 2 had been farming between 10 and 19 years, 8 had been farming between 20 and 29 years, 6 had been farming between 30 and 39 years, 6 had been farming for more than 40 years, and 2 did not provide how long they had been farming (Figure 1). Producers were further classified by the county in which they farm for description purposes. Producers represented 18 counties in 2 states (Figure 2). Of the North Dakotans who listed producer as at least one affiliation to the industry, 3 were from Burleigh County, 3 from Kidder, 2 from Richland, 2 from Ramsey, 2 from Adams, and 1 from Oliver, Hettinger, Sargent, Walsh, Eddy, Barnes, Dickey, Slope, Mercer, Steele, Cass, and Stutsman Counties. One producer farms in Wisconsin and another did not list the county.

Survey Environment

The organizational setting of the Annual Meeting was determined to be conducive to the process of encouraging members of NDLWPA to elaborate on their opinions, questions, and concerns regarding a major topic of discussion at the meeting (Taylor & Bogdan, 1998). Based on observation and personal communication with participants, questionnaires were completed immediately at the registration table, during the course of meetings, during discussions with other participants at lunches and banquets, and in the privacy of hotel rooms.

Survey Instrument

The questionnaire consisted of three description questions; one Likert-type scale to gauge the respondent's likeliness to adopt the technology; eight open-ended questions pertaining to the reasoning for the proposal of NAIS, advantages and disadvantages of RFID technology, perceptions of the roles of USDA-APHIS and NDLWPA, and recommendations for animal identification procedures; and three questions

pertaining to whether the individuals also own cattle, are members of NDSA, and perceptions of adoption likelihood of sheep producers compared to cattle producers. Questions were composed based on feedback from members of the Biosurveillance Working Group. The questions were then pre-tested and revised based on feedback from the president of NDLWPA.

Data Collection

Questionnaires were distributed at the registration table as participants picked up their registration packets and entered the general assembly meeting. Before receiving a questionnaire, participants were asked if they had already completed a questionnaire to avoid duplication. Participants were able to complete the questionnaire at their leisure over the course of the three-day convention. In exchange for completing the questionnaire, respondents received a vented cap with the researcher's university extension center logo. In speaking with members of NDLWPA before the Annual Meeting, extension services are seen as a supportive entity to producers.

Procedures for Data Analysis

Frequency measures were used to analyze responses to questions regarding the role of NDLWPA in the adoption/rejection process of RFID technology, whether USDA-APHIS was effectively addressing the concerns of producers, the purpose of NAIS, and recommendations for tracking sheep.

Frequency measures were also used to analyze the likelihood of members to voluntarily adopt RFID technology for tracking purposes. Responses to the questions regarding the advantages and disadvantages of the innovation and the respondent's conditions for adoption were coded and classified using the subsequent procedure: (1) Following Yin's (2003) process of pattern-matching logic, responses to the three questions were analyzed repeatedly to identify barriers to the adoption process. (2) Each questionnaire was then repeatedly analyzed to

determine if additional themes, as constituted by negative terms, also existed in the data. (3) Following Coffey and Atkinson's (1996) clustering of themes for organization, the themes were conceptually organized by an underlying construct (Boyatzis, 1998). Using the theoretical lens of diffusion of innovation, themes were organized into clusters relating to the five attributes that affect the adoption process. (4) Any themes identified that did not fit into the cluster classification system were documented.

Results and Discussion

When asked what role respondents thought NDLWPA should play in the adoption/rejection of RFID technology, whether they were for or against adoption, 85% (n = 22) of the respondents felt NDLWPA should be involved in the process. Suggestions ranged from having the organization be involved in the education process to implementing the system. A 20-year producer from Dickey County wrote, "The Association will be the educational tool to inform producers of opportunities and advancements in the technology." Assuming adoption will occur, a 20-year producer from Kidder County wrote, "Once RFID is accepted, Lamb and Wool could help educate people in the sheep industry on the advantages of being able to record information. Also work with research (ex. Hettinger) on best equipment." While a 21-year producer from Burleigh County felt the role of NDLWPA was to make sure the adoption did not occur until everyone agreed, "Central in policy development and 100% agreement before adoption." Other respondents looked to NDLWPA as the bridge to USDA and identified the organization an opinion leader in the industry. A producer from Sargent County explained the role of NDLWPA as "making sure that our voice is heard in adopting standards that are practical and serve a purpose to the industry." While a 6-year producer from Eddy County wrote, "They should have the final say in this process because they are the people who will implement it and make it successful."

In contrast to the support for NDLWPA, many respondents were unsure as to how well concerns were being addressed by USDA-APHIS. Some producers wrote USDA was addressing their concerns adequately (19%; n = 5), or even very well via the state veterinarian’s office and university extension (12%; n=3). However, 54% (n=14) of producers specifically stated their concerns were not being addressed. A 2-year producer from Ramsey County wrote, “I don’t think the government agencies will listen to the producers or others that will be using this ID system.” A 34-year producer from Adams County agreed, “I don’t feel that they are listening to the producers.” Four producers (15%; n=4) opted not to respond.

Seeing the connection between past crises and failures in the industry, respondents referred to specific events as the motivation for proposing NAIS. Participants who mentioned BSE as reasoning for the new system represented 62% (n = 16) of the total sample, while 15% (n=4) specifically mentioned scrapies, 12% (n = 3) mentioned 9/11, and 8% (n = 2) mentioned FMD. Some producers (19%; n=5) were more general in listing disease breakout, global food safety, and consumer demand as the reason for NAIS. However, a 40-year producer from Slope County was very specific in stating the reason was “politics,” and a 21-year producer from Burleigh County stated NAIS was proposed because of “Economic interests outside of the producers of the actual livestock.”

Table 1. Likelihood to Adopt RFID Technology

Likelihood	Number of Respondents
Already adopted.....	3
Likely to adopt – no conditions	3
Likely to adopt – under conditions	9
Undecided.....	2
Unlikely to adopt	5
Will not adopt.....	4

n = 26.

In determining how likely respondents were to voluntarily adopt RFID tagging, respondents were asked to rate their likelihood to adopt on a Likert scale (Table 1). Of the 26 who responded, 12% (n = 3) had already adopted RFID, 46% (n = 12) were likely to adopt, 8% (n = 2) were undecided, 19% (n = 5) were unlikely to adopt, and 15% (n = 4) indicated they will not adopt RFID technology. A 40-year producer from Slope County wrote the only circumstances that would make him adopt RFID were “mandatory or jail time.” The majority of the respondents (57%; n=15) indicated they had either already adopted or were likely to adopt RFID tagging. However, of the 12 respondents who were likely to adopt, but had not yet adopted 75% (n=9) listed conditions that need to be in place for them to adopt RFID tagging. Regardless of adoption likelihood, respondents listed 27 conditions for adoption.

Despite concerns over the reasoning behind the implementation of NAIS and some reservations in adoption, 77% (n = 20) of respondents were able to list advantages for adopting RFID technology for animal identification. Advantages included safe food, reduced animal theft, faster identification, speed of trace-back, speed of commerce, increased flock performance and profit, record retention, and determination of domestic meat from imported meat.

Meanwhile, 81% (n = 21) were able to identify disadvantages to the technology. Some respondents listed multiple disadvantages for a total of 33 comments. Using the theoretical lens of diffusion of innovation, disadvantages of the system and circumstances that needed to be in place for adoption were categorized and coded into the five attributes that affect the adoption process (Rogers, 2003).

Relative Advantage

Before anyone will replace a product or system, the advantages of the new product or system must be demonstrated. Relative advantage is defined as the degree to which an innovation is perceived as better than the idea it replaces (Rogers, 2003). The advantages must also be worth the additional costs. The scapie program already requires tagging, so the change in the system would be a different type of tag and reading equipment. At the time of the survey, USDA had not addressed who would be responsible for paying for any additional costs. Multiple respondents, like the 34-year producer from Adams County, specifically asked, “Who is going to pay for all the additional work and supplies involved with this?” Respondents who mentioned disadvantages regarding relative advantage or cost represented 42% (n = 11) of the total sample (Table 2), while 35% (n = 9) indicated relative advantage was a condition that would have to be met before adoption (Table 3). A 40-year from Slope County wrote, “Stupid to try to track – lots of work with no benefits.” A 30-year producer from Stutsman County listed the disadvantage as, “Cost paid by producer – no compensation.” A 6-year producer from Eddy County wrote, “I will adopt it if there is No Added Cost to me for adopting it.”

Compatibility

Compatibility is defined as the degree to which an innovation is perceived as being consistent with existing values, experiences, and the needs of potential adopters (Rogers, 2003). Comments related to a need to integrate the new technology with the current system of tagging were classified as concerns regarding compatibility.

Table 2. Classification of Disadvantages

Disadvantage	Number of Respondents
Relative Advantage.....	11
Compatibility.....	3
Complexity.....	9
Trialability.....	7
Observability.....	3
None.....	5

n = 38.

Table 3. Classification of Conditions for Adoption

Condition	Number of Respondents
Relative Advantage.....	9
Compatibility.....	5
Complexity.....	6
Trialability.....	2
Observability.....	2
Mandatory.....	3
None.....	5

n = 32.

Respondents that mentioned compatibility as a disadvantage represented 12% (n = 3) of the total sample (Table 2), while 19% (n = 5) indicated that compatibility was a condition that would have to be met before adoption (Table 3). A 36-year producer from Steele County wrote as a condition of adoption, “Convert the N.D. ID. system to the RFID system.” While a 34-year producer from Adams County recommended, “That the scrapie program already in place stays the same and the sheep will not have to do anything else.”

Complexity

Complexity is the degree to which an innovation is perceived as difficult to understand and use (Rogers, 2003). Concerns regarding complexity in user friendliness, compliance, and confidentiality were mentioned by 35% (n = 9) of respondents (Table 2), while 23% (n = 6) indicated that complexity was a condition that would have to be met before adoption (Table 3).

The concern over the ease of using the information was summed up in a comment from a 30-year producer from Burleigh County regarding a potential disadvantage as “Hard to use.” While a producer from Cass County wrote, “Most won’t do it right.”

While a few comments centered on compliance, including one from 15-year Hettinger County producer listing the disadvantage, “to get 100% cooperation.” Most comments regarding the complexity of the technology concentrated on the level of privacy for the information. A 21-year producer from Burleigh County felt a disadvantage to RFID was “...control of the data collected and how that info will be used.” A 2-year producer from Ramsey County mirrored the question in asking, “Who has control of the information and will have access to the information?” A 25-year producer from Wisconsin specifically asked, “Will RFID results ever be used to prosecute a producer?”

Trialability

Trialability is the degree to which an innovation may be experienced on a limited basis (Rogers, 2003). Comments related to trialability or testing the technology and demonstrating that it will work were made by 27% (n = 7) of respondents (Table 2), while only 8% (n = 2) indicated that trialability was a condition that would have to be met before adoption (Table 3). A 20-year Dickey County producer listed a disadvantage as, “Accuracy of reading tags.” While the main concern, as described by a Sargent County producer was “Retention of tag.” A circumstance needed to be in place for adoption was listed by a 30-year producer from Burleigh County as, “Get new tags.”

Observability

Observability is the degree to which the results of an innovation are visible to others (Rogers, 2003). Comments of concern, beyond if the technology would work, centered on if the respondents could see the technology working at the speed of commerce. Respondents with these concerns represented 12% (n = 3) of the total sample (Table 2), while 8% (n = 2) indicated that observability was a condition that would have to be met before adoption (Table 3). Respondents in this category did not see how RFID could work outside the test system. A 25-year producer from Wisconsin asked, “Can RFID actually work in everyday

life?” A 20-year producer from Dickey County said a disadvantage would be “Reading tags in large numbers of animals.”

Other

All the disadvantages listed by respondents were encompassed by the elements of the adoption process. However, 12% (n=3) indicated a condition that would have to be met before adoption would be mandatory enrollment or a law passed (Table 3).

Recommendations

When asked what the respondents recommend for an animal identification process, 27% (n = 7) recommended the continuation of the scrapie tag currently being used; 8% (n = 2) recommended implants; 8% (n = 2) recommended eliminating identification programs; and 27% (n =7) did not provide recommendations. A third of the respondents, (31%; n=8) did not specify a type of identification but provided recommendations for how the system should be implemented. A 36-year producer from Steele Country recommended “Do it in a non-busy time for the farmer.” While a 6-year producer from Eddy County recommended, “Should be kept on state control level as what we have now.” A 40-year producer from Mercer County simply suggested, “Cheap, permanent, easy.”

Recognizing the impact of NAIS on cattle producers as well as sheep producers, respondents were asked if they also owned cattle. Of the respondents who also own cattle (46%; n=12), only 25% (n=3) responded they were likely to adopt RFID tagging. In comparison, of the 54% (n=14) of respondents who only own sheep, 86% (n=12) said they are either likely to adopt or have already adopted RFID tagging. A producer from Sargent County stated the reason for the difference as, “Tradition – stockmen’s still believes branding is adequate form of animal tracking (flawed) sheep producers don’t have that same stigma.” While a 20-year producer from Kidder County wrote, “We already do scrapies so we are started.”

Literature Cited

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Table 4. Recommendations for Animal Identification

Recommendation	Number of Respondents
Tagging.....	7
Implants	2
No Animal ID	2
No Recommendation	7
Implementation Recommendation	8

n = 26.

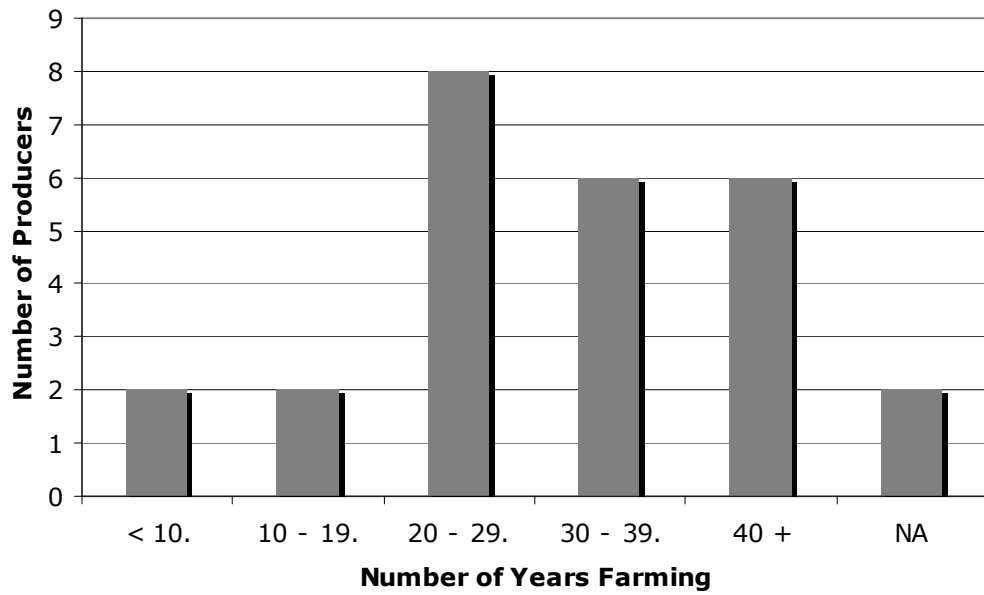


Figure 1. Number of Years Farming Graph shows how long participating producers have been farming.

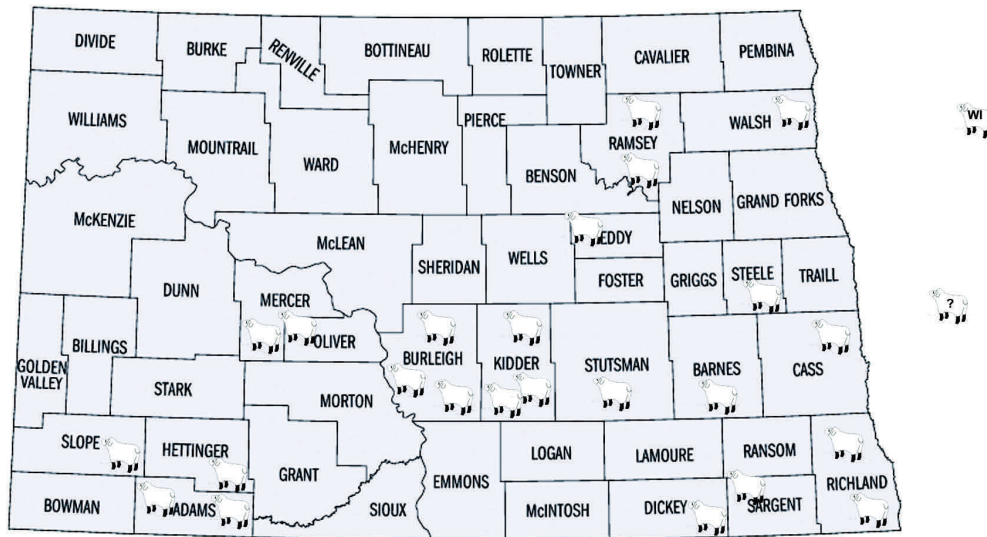


Figure 2. Producer Participant Map shows the counties in which respondents farm.