Determining the Educational Needs of Cattle Producers Regarding Pre-harvest Food Safety Products and Techniques

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ABSTRACT

The objective of this study is to determine the knowledge level of American cattle producers about issues relating to pre-harvest food safety. In recent years, feed additives and handling techniques have made significant improvements in reducing the bacterial load of beef cattle before they arrive at the harvest facility. The researchers will use survey technique to determine how much of this information has been effectively disseminated to the producers and if they have chosen to implement the technology. Data will be collected at the 2006 conference of the National Cattlemen’s Beef Association using electronic data collection. Results will be analyzed to determine general knowledge of feed additives and handing techniques. In addition, the researchers will determine the confidence level held by producers in their ability to provide a safer product by implementing pre-harvest food safety recommendations. Determining gaps in knowledge and false perceptions by the producers will allow the researchers to develop effective educational materials.

INTRODUCTION

Each year there are approximately 76 million cases of food-borne illnesses, 325,000 hospitalizations, and 5,000 deaths due to food-borne diseases (Mead et al., 1999). E. coli is one of the primary organisms which cause food-borne illness. Serious illnesses such as Hemorrhagic colitis, hemolytic uremic syndrome and possible death are a result from E. coli 0157:H7, which is a pathogenic strain of E. coli (Kaper, 1994). Research has increased recently due to the outbreaks of E. coli 0157:H7. This research has resulted in food safety interventions, which are available for beef cattle producers to implement into their own management program. A safe food product begins at the ranch and continues through the food chain process.

These food safety interventions can be aimed at altering attitudes, subjective norms or perceived behaviors (Ajzen, 2002a). Even though these interventions are currently available, there appears to be a knowledge gap. The gap lies between the researchers and the producers; how wide this gap is though is currently unknown. This research will determine the knowledge and confidence level of current producers, and results will lead into valuable publications, educational seminars and programs for producers pertaining to this issue.

METHODOLOGY

This research was conducted in the United States at the 2006 National Cattlemen’s Beef Association annual conference. Attendees of this conference served as the target audience, which allowed all segments of the beef industry to be represented. This study is a quantitative, descriptive correlation study, which describes an existing relationship between variables (Fraenkel & Wallen, 2006).

A survey instrument was distributed during the conference at the Texas Tech University booth within the trade show section of the event. Participant received a free black, leather portfolio. Researchers attempted to persuade each person that passed by the booth to fill out a survey. Survey research is the collection of information, both facts and opinions, using written questionnaires or interviews, broadly defined (Witkin, 1984). A researcher-developed instrument was the type of survey used. The content and face validity of this instrument was controlled by having a panel of experts review the instrument, which included a national panel of food safety experts and a group of agricultural educators. This instruments reliability was set by distributing a pilot test to beef cattle producers across the South Plains of Texas.
The instrument collected information in five construct areas. Construct I pertained to demographics, which determined the participants age, gender, ethnicity, occupation and level of education. Construct II consisted of a single question to identify how knowledgeable participants perceived themselves to be regarding pre-harvest food safety on a modified Likert-type scale from one-to-ten. Construct III was developed using the Witkin Model (Witkin, 1984), which determined the level of need. This construct evaluated the relationship between producers’ knowledge of pre-harvest food safety and their perceived importance of this issue, which was measured using a categorical scale with four points and anchored with descriptors at each end. In this section participants were asked to rank their knowledge of pre-harvest food safety technique on a four-point scale with descriptors at each end. Then, in a separate question they ranked the importance of each. A two-response or multiple-response discrepancy survey asks for an opinion on existing conditions and an opinion on desired conditions, and may repeat items in two sections, according to Witkin (1984). Construct IV pertains to the current behaviors or practices of beef producers regarding pre-harvest food safety. Six commonly used interventions were listed, and respondents were asked to mark interventions that they are currently practicing, an “other” space was also available for producers to describe other interventions that they currently using. Construct V pertained to the attitudes, subjective norms and perceived behavior of the participant. A modified Likert scale was used in order to obtain the respondent’s attitude of a behavior (Ajzen, 2002b).

RESULTS

Participants were asked to rank twenty questions on a Likert scale to help researchers determine beef producers attitude on food safety. The first two questions were on a ten-point scale. The question that received the highest mean of 5.81, with a standard deviation of 2.205, was: How knowledgeable are you regarding post-harvest food safety? The other question had a mean score of 5.48, with a standard deviation of 2.177, which was: How knowledgeable are you regarding pre-harvest food safety?

The other eighteen statements were on a four-point Likert scale. The four statements that were ranked the highest included:

1. Others expect me to provide a safe beef product. 
   \((M = 3.67)\) \((SD = 0.67)\)
2. I believe that post-harvest efforts to reduce pathogens are important. 
   \((M = 3.61)\) \((SD = 0.63)\)
3. People that I associate with in the beef industry view food safety as an important endeavor. 
   \((M = 3.53)\) \((SD = 0.67)\)
4. I am ultimately responsible for the image of the beef industry as it is portrayed to the public. 
   \((M = 3.51)\) \((SD = 0.75)\)

The four questions that ranked the lowest included:

1. I will attend research presentations while at this conference. 
   \((M = 2.86)\) \((SD = 0.94)\)
2. I am up-to-date on current beef industry research regarding food safety. 
   \((M = 2.90)\) \((SD = 0.80)\)
3. The industry spends an adequate amount of money on food safety. 
   \((M = 2.91)\) \((SD = 0.78)\)
4. I currently advocate using pre-harvest interventions that reduce the occurrence of pathogens in beef. 
   \((M = 2.91)\) \((SD = 0.85)\)

Producers’ knowledge on sodium chlorate, direct-fed microbials, vaccines, neomycin sulfate and seaweed/tasco were also surveyed to determine educational material that should be covered in the future. A model (Hershkowitz 1973) consisting of four quadrants was created, including: successful program (goals above the mean in both importance and knowledge), low-level successful programs (goals falling below the mean in importance, but above the mean in knowledge), low-level need (goals below the mean in both importance and knowledge), critical needs (goals falling above the mean in importance, but below the mean in knowledge (Hershkowitz 1973). The quadrants were divided based on the grand mean of importance items and the grand mean of knowledge items.
CONCLUSION

The survey analysis indicated that producers perceived their own knowledge levels to be highest in the areas of vaccines and direct-fed microbials. Knowledge tests should be administered to determine perceived levels versus true knowledge. While knowledge levels in these two categories ranked higher than seaweed/tasco, sodium chlorate and neomycin sulfate, it should be noted that overall knowledge scores were less than acceptable. Direct-fed microbials and vaccines both fell into the successful program quadrant. Both of these areas should continue to be monitored for maintaining excellence. Seaweed/tasco, sodium chlorate and neomycin sulfate fell into the low-level success quadrant. This indicates an increased need for educational materials in these areas.

REFERENCES


