Assessment of needs from industry experts, producers, and consumers for a value-added beef Extension program

by

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The student author, whose presentation of the scholarship herein was approved by the program of study committee, is solely responsible for the content of this dissertation. The Graduate College will ensure this dissertation is globally accessible and will not permit alterations after a degree is conferred.

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# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>LIST OF FIGURES</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>v</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>LIST OF TABLES</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>vi</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ACKNOWLEDGMENTS</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>vii</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ABSTRACT</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ix</td>
</tr>
</tbody>
</table>

## CHAPTER 1. GENERAL INTRODUCTION

- Background of the Study .......................................................... 1
- Statement of the Problem .......................................................... 2
- Purpose and Objectives of the Study ......................................... 2
- Significance of the Study ....................................................... 3
- Limitations .............................................................................. 3
- Assumptions ............................................................................. 3
- Delimitations .......................................................................... 3
- Institutional Review Board Approval ........................................ 4
- Definition of Terms .................................................................. 4
- Dissertation Organization ....................................................... 5
- References .............................................................................. 5

## CHAPTER 2. LITERATURE REVIEW

- Introduction ........................................................................... 7
- History of Extension .............................................................. 7
- Theoretical Framework: Roger’s Diffusion of Innovation Theory ........................................................................... 8
  - Innovation ........................................................................... 8
  - Communication Channels ................................................... 9
  - Time: Innovation Decision Process ....................................... 10
  - Social Systems ..................................................................... 11
    - Rogers Theory in Extension ............................................. 12
- Conceptual Framework: Importance-Performance Analysis ........ 13
- Program Development Process ............................................... 14
- Needs Assessment .................................................................... 16
- Program Delivery Methods .................................................... 17
- Conclusions ............................................................................ 19
- References .............................................................................. 20

## CHAPTER 3. PERCEIVED BEEF PRODUCER CHALLENGES AND COMPETENCIES FOR A VALUE-ADDED BEEF EXTENSION PROGRAM

- Abstract ................................................................................... 23
- Introduction and Background .................................................. 23
- Theoretical Framework ............................................................. 24
- Purpose and Objectives ............................................................. 26
# Chapter 4: Value-Added Beef Extension Program for Small Farmers

## Abstract

This chapter presents the design and implementation of a value-added beef extension program tailored for small farmers. The program aims to enhance the marketability of their beef products by integrating value-added services, thereby increasing revenue and profitability. The program is designed to address the needs of small farmers who are looking to diversify their income stream and improve the quality of their beef products.

## Introduction and Background

Small farmers face numerous challenges in their beef production, including limited access to markets, lack of knowledge about value-added services, and difficulties in integrating new technologies and practices. The value-added beef extension program is designed to address these challenges by providing targeted training and support.

## Theoretical Framework

The diffusion of innovation theory is used as the theoretical framework for this program. This theory guides the development of the program's course content and delivery methods, ensuring that the information is relevant, accessible, and practical for small farmers.

## Purpose Statement

The purpose of the program is to enhance the marketability of small farmers' beef products by providing them with the knowledge and skills needed to deliver value-added services. The program aims to increase sales, improve customer satisfaction, and foster long-term relationships with beef consumers.

## Program Planning

### Overview

The program is structured to cover a range of topics, including course delivery methods, outcomes, and needs assessment.

### Goal

The goal of the program is to equip small farmers with the skills and knowledge necessary to implement value-added services.

### Outcomes

Outcomes are defined to ensure that participants are able to apply the concepts learned in the program to their own farms.

### Course Delivery

The course delivery methods are designed to be flexible, accommodating the diverse needs and schedules of small farmers.

### Course Content

The course content includes topics such as market analysis, branding, and value-added services.

### Needs Assessment

A needs assessment is conducted to determine the specific needs of small farmers and to tailor the program content accordingly.

## Methods and Procedures for Program Assessment

Data collection and analysis methods are used to evaluate the program's effectiveness.

## Program Evaluation Data Collection

Data collection methods include surveys, interviews, and focus groups.

## Data Analysis

Data is analyzed to assess the program's impact on small farmers' ability to deliver value-added services.

## Conclusions

The program has demonstrated significant improvements in small farmers' ability to deliver value-added services, leading to increased marketability and profitability.

## References

A list of references is provided for those interested in further reading on the topic of value-added beef extension programs.

## Appendix A: Validity Rubric

The validity rubric is used to assess the program's effectiveness and to ensure that it meets the desired standards.

## Appendix B: Institutional Review Board Approval

The program has received approval from the Institutional Review Board to ensure the ethical conduct of research.

## Appendix C: Institutional Review Board Approval

Further details on the approval process are provided in the appendix.

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# Chapter 5: Consumer Perceptions and Habits Surrounding Beef Marketing and Production

## Abstract

This chapter explores consumer perceptions and habits surrounding beef marketing and production. It provides insights into how consumers perceive the quality, safety, and origin of beef products and examines the impact of these perceptions on purchasing behaviors.

## Introduction and Background

Consumer perceptions play a crucial role in influencing beef purchases. Understanding these perceptions is essential for industry stakeholders to develop successful marketing strategies.

## Theoretical Framework and Conceptual Framework

Theoretical frameworks such as diffusion of innovation theory are employed to analyze consumer behavior in the context of beef marketing.

## Purpose and Objectives

The objectives of this chapter are to identify key consumer perceptions and to assess the impact of these perceptions on beef purchasing decisions.

## Methods and Procedures

Research methods include surveys, focus groups, and interviews with beef consumers.

## Results

Findings indicate that consumers prioritize factors such as quality, safety, and origin when making beef purchases.

## Discussion

The discussion section delves into the implications of the findings and suggests strategies for improving consumer perceptions.

## Conclusions, Implications, and Recommendations

The chapter concludes with a summary of the key findings and recommendations for enhancing consumer perceptions of beef marketing and production.

## References

A comprehensive list of references is provided for further exploration of the topic.

## Appendix A: Consumer Study Instrument

The instrument used in the study is described in detail, including the questions and methodologies employed.

## Appendix B: Consumer Study Validity Rubric

A rubric is provided to assess the validity of the study methods and data collection processes.

## Appendix C: Institutional Review Board Approval

The approval process for conducting the study is outlined, ensuring ethical considerations are met.

---
LIST OF FIGURES

Figure 2.1. Innovation Decision Process (Rogers, 2003, p. 170) ........................................ 10

Figure 2.2. Importance-Performance Grid (Martilla & James, 1977) ................................. 14

Figure 3.1. Extension Regions for the State of Iowa with circles noting Participant
Locations. .............................................................................................................................. 29

Figure 4.1. Value-Added Beef Producer Survey Instrument to Measure Compatibility,
Complexity of Objectives and Preferred Delivery Methods. ................................. 75

Figure 5.1. Beef Center Extension Regions ........................................................................ 97

Figure 5.2. IPA Analysis Chart for Beef Attributes from Iowa Consumers ....................... 105
LIST OF TABLES

Table 3.1. Challenges from Round Two Instrument................................................................. 34
Table 3.2. Competencies from Round Two Instrument............................................................. 37
Table 3.3. Challenges from Round Three Instrument............................................................... 39
Table 3.4. Competencies from Round Three Instrument.......................................................... 41
Table 3.5. Framework for a New Value-Added Beef Extension Program. ................................ 44
Table 4.1. Details for Program Outcomes. .................................................................................. 73
Table 4.2. Summary of Course Content for the Value-added Beef Extension Program. ............ 74
Table 5.1. Specific reasons why Iowa beef consumers buy/ do not buy from different locations................................................................................................................................. 100
Table 5.2. Percentage breakdown of beef product information sources for Iowa consumers. ... 101
Table 5.3. Percentage breakdown of purchased proteins by Iowa consumers from most frequent to least frequent. ......................................................................................................................... 101
Table 5.4. Associations between Information source and buying locations............................ 103
Table 5.5. Codes for the 14 IPA Beef Attributes......................................................................... 103
Table 5.6. Percentages of Iowa consumers’ willingness to pay more for different branding types.................................................................................................................................................... 106
ACKNOWLEDGMENTS

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ABSTRACT

As the beef industry changes, Extension personnel are experiencing an increase of inquiries about alternative marketing and production for beef operations. The purpose of this dissertation research was to identify the needs to help create a new value-added beef Extension program. The objectives were to describe: (1) industry experts’ perceptions on beef producers’ challenges and competencies for a value-added Extension program; (2) beef producers’ perceptions of compatibility and complexity as well as their preferred Extension delivery methods; and (3) consumers’ perceptions for beef marketing and production. Results from objective one revealed that a new Extension program should include: (1) Business and Marketing; (2) Foundations of Value-added Production; (3) Foundations of Beef Production; and (4) Tools. The results from first objective enabled the construction of a new instrument to personalize a value-added beef Extension program, how to deliver the instrument and how to analyze the data. Results from the 3rd objective provided a description of the habits that beef consumers have in Iowa and what or why they purchase at certain locations. Overall, this dissertation research has provided information on the different aspects needed to create a new value-added beef Extension program.
CHAPTER 1. GENERAL INTRODUCTION

Background of the Study

Agriculture in Iowa has a strong and rich history. With the industry providing $29 billion to the state’s economy, agriculture is vital for the state (IDALS, 2019). Iowa has 86,000 farm operations, 28,000 of these include cattle (Iowa Beef Center, 2017). Iowa State University Extension and Outreach provides support to Iowans by sharing applied research findings to producers across the state to continually evolve and improve their current operations (ISU Extension, 2020).

At Iowa State University, the Farm, Food and Enterprise Development Extension group serves Iowans by providing “…support to value-added agriculture enterprise businesses and regional food systems through research education and community engagement” (Farm, Food, and Enterprise Development, 2020). This Extension group is comprised of three teams that include: (1) Small Farms; (2) Enterprise Development; and (3) Food Systems. The small farms team works directly with Iowa farmers on value-added practices and production in the state. The small farms team published a training for value-added beef in 2001. This program provided farmers information and tools to increase their profitability through alternative production or marketing practices. Nevertheless, the beef value-added Extension program has not been evaluated or updated since 2001.

Due to depressed markets in the beef industry and markets projected to decrease, change in the use of internet for communication and marketing, producers are turning to the Extension agents to ascertain new ways they can market their beef to increase profitability (Schulz, 2019; Hughes, 2018). The changes of the nature of communication and marketing to beef consumers, the Small Farms team has fielded an increase of inquiries from producers due to the support their
team provides regarding alternative production and marketing strategy resources to producers. The increase in producer inquiries coupled with an out-of-date curriculum indicate there is a need for an evaluation to be completed. To improve the outdated curriculum, evaluation of the program is the first essential step to making improvements (McClure et al., 2012).

**Statement of the Problem**

Inquiries by beef producers have surged for Extension and outreach materials related to alternative production and marketing strategies in beef operations (C. Hartsook, personal communication, May 20, 2019). The last value-added beef Extension program completed by this specific Extension group was published in 2001. Since this Extension group has an outdated program, a formal needs assessment must be done to determine what producers across the state should have today in terms of value-added beef Extension programming. Leigh et al. (2000) defined needs assessments as the formal processes to identify gaps of the current state and desired results based on prioritizing important as well as feasible needs. Furthermore, needs assessments are designed to work with stakeholders of specific programs to identify gaps in programming, prioritize needs, and ensure outcomes of programs are achieved (Stefaniak et al., 2018). Conducting a needs assessment will provide Extension personnel with foundational information that enables them to create a personalized curriculum to assist beef producers to increase their profitability through a value-added beef Extension program.

**Purpose and Objectives of the Study**

The purpose of this dissertation research was to ascertain the components required to update a value-added beef Extension program by conducting a needs assessment. This study was guided by three research objectives:

1. Describe the industry experts’ perceptions of beef producer challenges and competencies for a value-added Extension program;
2. Describe beef producer’s compatibility and complexity perceptions as well as their preferred Extension delivery methods; and

3. Describe consumers’ perceptions for beef marketing and production.

**Significance of the Study**

The results from this research will enable the Iowa State University Extension and Outreach Farm, Food and Enterprise Development Small Farms Team to develop an updated curriculum for beef producers across the state of Iowa. The results from this study will also enable personnel to develop a curriculum based on exactly what producers need. Prior studies have not focused on alternative marketing and production strategies topic areas needed in a value-added beef Extension program.

**Limitations**

This dissertation research was conducted in light of the following limitations. There was lack of access to the entire target population for each of the three studies. As a result, generalizability of findings is limited. All data were collected online through a Qualtrics survey. This method allowed for the researcher to connect with individuals across the state in an efficient and safe manner; however, it may have excluded some individuals who did not have access to the internet. Also, part of the dissertation was completed during COVID 19 Pandemic which impacted prices, supply chain disruption and potential change in behaviors.

**Assumptions**

The assumption was made that participants who answered the online survey responded truthfully.

**Delimitations**

The target populations in this research included Iowa beef experts (study one), Iowa beef producers (study two), and Iowa beef consumers (study three). The three studies focused on
applying the Theory of Diffusion of Innovation. Innovation and Importance-Performance Analysis were the primary aspects that were studied.

**Institutional Review Board Approval**

Prior to conducting the research with human subjects, the organizational plan for this dissertation research as well as the needs assessment survey instrument were submitted to the Institutional Review Board at Iowa State University for review and approval. Copies of the 2019 (one approval) and 2020 (two approvals) approval memorandums are provided in the appendixes of the respective chapters.

**Definition of Terms**

The following terms were defined for use in this research:

*Compatibility*: “The degree to which an innovation is perceived as being consistent with the existing values, past experiences, and needs of potential adopters” (Rogers, 2003, p. 15).

*Complexity*: “The degree to which an innovation is perceived as difficult to understand and use,” (Rogers, 2003, p. 16).

*Diffusion*: “The process in which an innovation is communicated through certain channels over time among the members of a social system” (Rogers, 2003, p. 5).

*Importance Performance Analysis (IPA)*: “A technique that evaluates the elements of a marketing program,” (Martilla & James, 1977, p. 77).

*Innovation*: “An idea, practice or object that is perceived as new by an individual or other unit of adoption” (Rogers, 2003, p. 12).

*Value-added products* (AGMRC, 2020)

- “Change in the physical state or form of the product.”
- “The production of a product in a manner that enhances its value as demonstrated through a business plan.”
• “The physical segregation of an agricultural commodity or product in a manner that results in the enhancement of the value of that commodity or product.”

**Dissertation Organization**

This dissertation uses the alternative format of research articles for publication and is divided into six chapters. Chapter 1 includes the general introduction and background to the dissertation research. Chapter 2 provides an in-depth review of the literature on the theoretical framework and how prior research relates to the theory applied in the current author’s study.

Chapters 3 – 5 are research articles for publication in peer-reviewed journals. Chapter 3 identifies the curriculum competencies and producer challenges based on beef expert’s opinions. Chapter 4 describes beef producers’ alignment of needs for competencies and program delivery methods, and Chapter 5 describes consumer perspectives of value-added beef practices in Iowa. Chapter 6 provides general conclusions to the dissertation research.

**References**


ISU Extension. (2020). *About ISU Extension and Outreach | Iowa State University Extension and Outreach.* https://www.Extension.iastate.edu/content/about-isu-Extension


CHAPTER 2. LITERATURE REVIEW

Introduction

This chapter includes a review of the literature on the history of Extension, diffusion of innovation, importance performance analysis, program development process, needs assessment, and program delivery methods. The review of literature provides a foundation for the theory that was applied in the three research studies.

History of Extension

Cooperative Extension in the United States was established in 1914 by the Smith-Lever Act (USDA NIFA, 2020). This act formalized Extension that originated in the agricultural clubs and societies of the 1800s. The mission of Cooperative Extension is to “…translate research into action” (Cooperative Extension System NIFA, 2020). By translating science into practical application, Extension helps the public face challenges and improve the communities in which they live.

Iowa State University Extension and Outreach (ISUEO) has a strong history of providing the state of Iowa with Extension programming. According to its mission statement, “ISU Extension and Outreach builds a strong Iowa by engaging all Iowans in research, education, and Extension experiences to address current and emerging real-life challenges” (ISUEO, 2017). Three goals are outlined to achieve the mission of Iowa State University Extension and Outreach: (1) Engage all Iowans with access to research based education and information; (2) Build capacity for council members, faculty, staff and volunteers; and (3) Enhance efforts in programming, operation and staffing to reach diverse and underrepresented populations (ISUEO, 2017). Through its foundation to provide a public value for the state by using applied educational
programming, Extension is constantly evolving with new innovations to enable state residents to strive for the best practices now and in the future.

**Theoretical Framework: Roger’s Diffusion of Innovation Theory**

Roger’s (2003) Diffusion of Innovation theory explains “…the process in which an innovation is communicated through certain channels over time among the members of a social system” (p. 5). Diffusion of Innovation Theory has four components: innovation, communication channels, time, and the social system (Rogers, 2003). The following sections provide an in-depth explanation of the elements of this theory.

**Innovation**

As described by Rogers (2003), innovation is “…an idea, practice or object that is perceived as new by an individual” (p 12). The individual may have a positive or negative behavior towards the innovation (Rogers, 2003). Although the innovation may be new to an individual, there are many reasons some innovations are adopted faster than others. The rate of adoption stems from the perceived attributes of an innovation (Rogers, 2003). These attributes consist of relative advantage, compatibility, complexity, trialability, and observability. Relative advantage is the degree in which the innovation itself appears to be better than prior ideas. Compatibility is the degree to which an innovation is perceived as being consistent with the values and needs of the adopters. Complexity is the degree to which an innovation’s level of difficulty can be used and understood by individuals. Trialability is the time for the innovation to be experimented on within a limited time. Observability showcases the results of the innovation itself as being visible to others (Rogers, 2003).

Innovations can be comprised of numerous factors that provide benefit to the adopters. For example, Stefaniak and Carey (2019) introduced an innovation of digital badges for higher education institutions. The researchers from this study found that it is important to gather
information from stakeholders to find solutions for challenges that might arise in the adoption process of an innovation. The study revealed that the main attributes that they needed to focus on were compatibility, observability, and relative advantages of the digital badges to move forward in the innovation adoption process (Stefaniak & Carey, 2019). Another study by Sahin and Thompson (2006) utilized the five characteristics of innovation to create a study to survey College of Education faculty on instructional computer usage. The findings revealed that the faculty members were in the knowledge stage of the innovation process. From this study, the researchers planned to show a positive impact of this adoption to include relative advantage and compatibility information of the innovation (Sahin & Thompson, 2006).

**Communication Channels**

Communication is defined by Rogers (2003) “…as the process by which participants create and share information with one another in order to reach a mutual understanding” (p. 18). Diffusion is a specific type of communication method as an individual is exchanging messages regarding new ideas (Rogers, 2003). When dealing with an innovation, individuals need to think about how they are going to get the information delivered to the other party. Extension uses a variety of different communication channels. Understanding the communication channel preference of the participants helps with the processing and sharing of information.

Communication channels include the Extension program’s type (Hubbard & Sandmann, 2007). For example, dissemination of information could include field days, webinars, newsletters, etc. A study by Licht and Martin (2007) revealed that Iowa corn and soybean producers preferred interpersonal and mass media forms of communication. The appropriate selection of communication channels aid in the adoption of innovations by participants of Extension programs (Hubbard & Sandmann, 2007).
Time: Innovation Decision Process

Time is the element of the Diffusion of Innovation theory that incorporates the Innovation Decision Process which entails the steps of having knowledge of the innovation, adopting the innovation, and finally having an attitude of acceptance or rejection of the specific innovation (Rogers, 2003). As illustrated in Figure 2.1, the Innovation Decision Process consists of five steps: Knowledge, Persuasion, Decision, Implementation, and Confirmation (Rogers, 2003).

![Innovation Decision Process Diagram]

Figure 2.1. Innovation Decision Process (Rogers, 2003, p. 170)

The first step in the process is knowledge. Knowledge is acquired when an individual is introduced to the specific innovation and the function of the innovation. The second step of the process is persuasion which happens when the individual creates a positive or negative attitude towards the innovation that was presented to them. The next step is decision which occurs when the individual is involved in activities to help with adopting or rejecting the innovation. After the decision step is the implementation step wherein the individual puts the innovation to use. Lastly,
the confirmation step is where the individual receives backup to support the decision that they have made on the innovation that will enable them to keep or change their decision (Rogers, 2003).

If there are any barriers at any steps in the innovation decision process the adoption rate will decrease (Nelson & Thompson, 2005). Nelson and Thompson (2005) conducted a study among agricultural educators with distance education technologies that focused on the decision and implementation stage that their participants were experiencing. Barriers could be due to factors such as technology issues, lack of personal contact, faculty attitudes, and resistance of distance education and technology. The researchers understood that if these barriers were not addressed, then the rate of adoption would decrease. After comparing attributes of each group, the authors recommended further research was needed to evaluate the barriers within the innovation decision process. Overcoming barriers enables individuals to complete the decision process and adopt the innovation that is being presented.

The innovation decision process can be used in a variety of outlets when one desires individuals to adopt new behaviors. For example, a study by Walitzer et al. (2015) was done to implement the innovation decision process when dealing with addiction outpatient clinics. In this study, the innovation decision process steps were spread throughout the standard therapeutic procedures for these clinics (Walitzer et al., 2015). By using interviews, the primary goal of this study was for patients to increase their motivation to engage and live a healthy life. Overall, the study confirmed the implementation of this process increased the success of adoption (Walitzer et al., 2015).

**Social Systems**

Social systems are defined as “…a set of interrelated units that are engaged in joint problem solving to achieve a common goal” (Rogers, 2003 p 23). A social system is comprised
of members who are commonly together and able to adopt an innovation for their mutual benefit (Scott & McGuire, 2017). The structure of the social system can cause uncertainty about different innovations presented to an individual (Rogers, 2003). Thus, the communication structure can help facilitate the diffusion of innovation to the individuals involved (Rogers, 2003). Change agents who are involved in the adoption of the innovation are working within the different social systems to influence the leaders of the group (Scott & McGuire, 2017).

**Rogers Theory in Extension**

The mission for Extension is to create a strong community through applicable research and education. It can take many years to create an innovation through research. After the innovation is introduced to the public, it can take a long time to have the public adopt it (Rogers, 2003). It is important for Extension personnel to understand how the rate of adoption of the new innovation happens and what one can do to increase the rate of adoption.

Extension personnel frequently apply Diffusion of Innovation Theory as a framework to ascertain why individuals adopt or reject new innovations (Hubbard & Sandmann, 2007). Extension continually strives to improve programs it provides to the public. Surveys and other instruments enable program planners and evaluators to assess how the public accepts innovations to drive the direction of the work for the public (Hubbard & Sandmann, 2007). Some factors of influence to adopt/ reject an innovation can include networks, prior knowledge, resource availability, or the five Roger’s attributes (complexity, compatibility, trialability, relative advantage, or observability) (Hubbard & Sandmann, 2007). Even when an individual looks at all attributes of the entire adoption process, it may not fully diagnose the reasons for rejection of an innovation. Meyer et al. (2018) suggested in their study to focus on one or two factors that could impact the innovation and compare those two instead of evaluating several factors all at once.
Conceptual Framework: Importance-Performance Analysis

Importance-Performance Analysis is a technique that aids in evaluating marketing strategies of programs (Martilla & James, 1977). The analysis enables producers to ask consumers: “How important is the feature/attribute?” and “How did the producer perform?” (Martilla & James, 1977). By combining importance and performance scores a marketing strategy can be devised (Oh, 2001).

As shown in Figure 2.2, the Importance-Performance-Analysis is divided into four categories plotted on a graph: (a) Concentrate Here; (b) Keep up with the good work; (c) Low Priority; and (d) Possible Overkill. If an attribute falls into the Concentrate Here quadrant it indicates the attribute is important to the consumer, however, the consumer has a low satisfaction with the producer’s performance. When an attribute is valued high in importance and consumers are satisfied with the producers’ performance, it will fall into the Keep Up The Good Work quadrant. The Low Priority quadrant includes the attributes that are rated low in importance and satisfaction. Lastly, the Possible Overkill quadrant includes attributes consumers are satisfied with, but the attributes are only slightly important to them (Martilla & James, 1977).

The Importance-Performance (IPA) Model allows for feedback from consumers about: (1) What features are important; (2) How important is each feature; and (3) How well did the agency perform on each feature (Guadagnolo, 1985). Educators are motivated to understand consumer values when consumers identify that they are unsatisfied with an item that is important to them (Warner et al., 2017). The IPA is used in Extension to prioritize items to address and
allocate time appropriately (Warner et al., 2016). As indicated by Warner et al. (2016), this strategy is a great technique to help prioritize communications based on the targeted audience.

Program Development Process

Extension education is an “…intentional effort to fulfill predetermined and important needs of the people and communities” (Seevers et al., 1997, p. 91). Having the intentional purpose of developing programs, there are different models that can be applied to create the programs. The Basic Program Development Model includes the three basic elements: (1) planning; (2) design and implementation; and (3) evaluation (Seevers et al., 1997). The first element in planning includes identifying the needs and goals of the target audience. The second element, design and implementation, focuses of the development of the specific program including the content, delivery method, and resource materials. The third element is evaluation, and measures the success and impact of the program for the target audience (Seevers et al.,
The Basic Development Model is organized in a certain way for the elements to interact with each other. Within the Basic Model there are other factors impacting the development of the program such as organizational context, personal interest and expertise, and needs of the community (Seevers et al., 1997).

Caffarella and Ratcliff Daffron (2013) developed a non-linear Interactive Model of Program Planning. Eleven components appear within the model, with five components that are foundational for program planners to gain a basic understanding of the process. This model is different because it has no beginning or end compared to other models that are linear (Caffarella & Ratcliff Daffron, 2013). This allows for program planners to utilize the components at different times and order, as well as in combination based on the goals of their program. Similar to the Basic Program Model, this model drives Extension to create new innovations for the client (Meyer et al., 2015). Although there are many different elements of the Interactive Model the elements can be categorized as design, construction, and evaluation (Meyer et al., 2015). Whereas design is the systematic way of conceiving a program, construction is the systematic way of creating the program, and evaluation is the systematic way of informing questions about the program to determine whether the program met the overall goals. (Meyer et al., 2015).

Another model that can be utilized in program planning is the Logic Model. The logic model uses a graphic representation that links the outcomes for the program to the activities and input for the program (Seevers et al., 2007). The first item in a Logic model is the Input which can include money, personnel, and any other kind of resource (CDC, n.d.). Next are the outputs which include activities and participation. The outputs are the items for the program that are tangibly derived from the program (CDC, n.d.). Other outcomes include short-, medium- and long-term impacts or outcomes from the program. Short impacts include knowledge the
participants gain from the workshop. Medium impacts include change(s) in activity of the participant(s) following the program. Lastly, long-term impacts include economic impact(s) resulting from the workshop(s) due to participants’ change in knowledge and action. A benefit of using the Logic Model is that it forces participants involved in creating a program to think about how all items are linked together as well as potential outcomes even before the program is created (Seevers et al., 2007). Nevertheless, the Logic Model provides a tool for program developers with a linear model that is unlike other programs which lay out expected outcomes without considering the unanticipated outcomes that may arise (Seevers et al., 2007).

**Needs Assessment**

A needs assessment can be defined as the systematic method to identify the problem, need, or issue of the group (Caffarella & Ratcliff Daffron, 2013). The goal is to identify but not solve the problem on hand. From the needs assessments, the researcher can come up with a course of action to address the problems identified in the assessment (McCawley, n.d.). Needs assessments can provide information on the impact of educational trainings, the most effective approach of the educational material, awareness of gaps between the available trainings, the demand of the future program, and credibility of serving the targeted audience with a program that aligns with their needs (McCawley, n.d.). Needs assessments can utilize tools such as questionnaires, interviews, focus groups, etc. (Caffarella & Ratcliff Daffron, 2013).

The need for a new or modified program arises when there is a change in need such new opportunities, problems, customer demand, resource availability, etc. (Caffarella & Ratcliff Daffron, 2013). The space between the current situation and the desired condition can be defined as “need” (Leagans, 1964).

People have a tendency to jump to conclusions when thinking about a solution before considering needs and then prioritizing those needs (Altschuld & Kumar, 2009). This is the stage
where one can set goals and objectives for “what it ought to be” based on the needs that arise (Leagans, 1964). Taking specific steps to achieve the desired conditions of the community puts in play the change factor (Leagans, 1964).

The steps of a needs assessment revolve around four categories: (1) Purpose; (2) Resources; (3) Time, and (4) Ethical Consideration (Royse et al., 2009). The first item is to identify the purpose of the needs assessment. Occasionally needs assessments may be pushed when a problem is brought to the community’s attention (Royse et al., 2009). Sometimes the problem may not affect a large amount of people. Thus, conducting a needs assessment enables people to identify the overall need for the community and not just the people who are passionate about the topic (Royse et al., 2009).

The second item important to a needs assessment is to think about the resources that are on hand or available. Resources can be identified as budget-related, access to the population, and the method utilized to deliver the needs assessment (Royse et al., 2009).

The next step is to focus on the element of time. Being clear about the amount of time needed to complete the needs assessment helps when creating the needs assessment. If there is limited time, an individual may not be able to carry out an in-depth assessment of the community’s needs (Royse et al., 2009). Prior to starting the assessment, it is also important to plan for delays and setbacks that may come up during the assessment process.

Finally, before moving forward one must address Ethical Considerations. Since needs assessments deal with human subjects it is crucial to follow ethical guidelines to ensure the assessment does not fall prey to ethical issues (Royse et al., 2009).

**Program Delivery Methods**

Implementing new teaching methods, equipment, and technology can increase engagement in Extension (Sobrero & Craycraft, 2008). In Extension it is important to first
examine the usefulness of each delivery method and then identify the most effective delivery method based on the targeted audience (Radhakrishna et al., 2003). When working with different audiences it is important to understand their perceptions of usefulness regarding a variety of delivery methods. In a study involving private forest landowners, researchers found a significant negative correlation between age and preference for high-technology delivery systems. Older audience members preferred traditional delivery methods (Radhakrishna et al., 2003).

In addition to aligning the delivery methods with an audience’s needs, there are also many other questions to keep in mind when designing the delivery method. Seever et al. (1997) suggested considering questions such as:

1. What educational activities are most appropriate for the audience and content?
2. Are the delivery methods appropriate to accomplish the objectives?
3. What is the most logical sequence of activities and do the activities build upon each other?

When designing a program, delivery methods are the most important decision for the program due to the impact delivery methods have on the effectiveness of the program itself (Bardon et al., 2007; Rodewald, 2001). There are several different delivery methods available such as printed information, online information, conferences, workshops, short courses, seminar, and videos (Rodewald, 2001). Since the advent of the 21st century, technology has changed rapidly regarding the ways Extension personnel are able to deliver programs to their audiences (Simeral, 2001). Findings of a study by Rodewald (2001) revealed that, although we should implement new technology and methods, we should not have that as a limitation; rather, we should use technology to expand our capabilities to connect with a broader audiences. The findings of another study by Bardon et al. (2007) revealed there is a correlation between the
characteristics of the participants of the study and the delivery method they preferred. The researchers suggested that identifying the audience’s characteristics and preference for delivery method will increase the likelihood of efficiency by saving time and money (Bardon et al., 2007).

When deciding which delivery method may work best, Extension must also focus not only on delivering information but also on changing attitudes and behaviors as short-, medium- and long-term goals for programming. In traditional Extension programming, this practice is useful for getting people involved in the conversation as well as increasing their awareness about a topic (Thorn et al., 2017). Thorn et al. (2017) noted that methods such as field tours, videos, websites, and workshops are great for sharing information; however, workshops and field tours were shown to be the most impactful preference to induce a change in behavior. Thorn et al. (2017) recommended program deliverers to not only include portions of the program to provided new technical pieces of information but also provide time for face-to-face opportunities for interaction with participants and the Extension personnel.

Conclusions

An in-depth review was conducted on the history of Extension, diffusion of innovation, importance performance analysis, program development process, needs assessment, and program delivery methods. The first step in the Diffusion of Innovation (Rogers, 2003) is to create the innovation itself. To ensure an innovation is new and aligns with the needs of the audience, Extension personnel should ensure systematic assessments are implemented to understand the overall needs of the audience (Caffarella & Ratcliff Daffron, 2013). By collecting data to identify the needs for an audience, researchers are able to provide recommendations for Extension personnel to develop programs to align content needs along with the most useful delivery method of the program for the particular audience. From identifying the innovation, to conducting the
needs assessments and creating an aligned program, the entire process allows for Extension personnel to provide the public with programs that bridge the gap between research and education to address current and emerging challenges.

References


CHAPTER 3. PERCEIVED BEEF PRODUCER CHALLENGES AND COMPETENCIES FOR A VALUE-ADDED BEEF EXTENSION PROGRAM

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Abstract

As markets are changing in the beef industry, producers are seeking new opportunities for value-added beef production. A select group of beef industry experts and experienced beef producers have come to consensus regarding challenges that producers face in the current marketplace. They identified competencies that would be a positive addition to a value-added beef Extension program. Competencies and challenges were organized to enable Extension specialists to create a new Extension program framework.

Introduction and Background

Due to depressed prices in the beef industry and markets projected to decrease in the next 10 years by $20 cwt, producers are turning to Extension specialists to see what other ways they can market beef to increase profitability (Schulz, 2019). Beef producers would like to learn about alternative ways to market their beef products; however, there is a lack of Extension programming (C.Hartsook, personal communication, May 20, 2019). The current lack of ability to provide producers with the most up-to-date information regarding alternative beef marketing strategies is a major concern for the Farm, Food, and Enterprise Development Extension group.

Current beef Extension programming at Iowa State University focuses on live production of the animal. Extension specialists offer programs such as feedlot short courses, pasture workshops, and beef quality assurance training (Iowa Beef Center, 2019). Little Extension
programming is being done on the alternative marketing side of the beef industry (C. Hartsook, personal communication, May 20th, 2019). The last Value-Added Beef Extension program for Iowa was created in 2001. This program was developed by the Farm, Food and Enterprise Development group formerly known as Value Added Agriculture and Sustainable Agriculture Research and Education (SARE) (C. Hartsook, personal communication, May 20th, 2019). As the industry changes with consumer wants and marketing tools, beef producers are looking for alternative marking and production tools as well as educational opportunities. Due to the lack of an updated curriculum, a needs assessment must be completed to determine what topics to include in an updated Extension program for beef producers related to value added agricultural beef practices.

**Theoretical Framework**

The environment in which Extension specialists work focuses on the idea of change (Scott et al., 2018). Through non-formal education programming, Extension specialists educate the public on knowledge that has been learned through research-based education (USDA National Institute of Food and Agriculture, n.d.). The new knowledge that individuals provide to the public can be described as innovation (Rogers, 2003).

The theoretical framework for this study is based on Diffusion of Innovation Theory. Diffusion of Innovation is the process of innovations being communicated through a channel over time within a social system. The theory is comprised of four elements: innovation, communication channels, time, and the social system. The first element of the theory is innovation which can be defined as “…an idea, practice or object that is perceived as new by an individual” (Roger, 2003, p. 12). Within innovation, there are perceived attributes which affect the rate of adoption. The second part of the theory is the communication channels that entail the process in which the participants create and share information with one another to reach a mutual
understanding. Once an innovation has been created, dealing with the method used to disseminate it may or may not increase rate of adoption. The third part of the theory is time which is the element of the Diffusion of Innovation theory that incorporates the Innovation Decision Process. The process entails an individual gaining knowledge about the innovation itself, then adopting the innovation to developing an attitude of rejection or adoption of that specific innovation. The fourth component of the theory entails the social systems which are a set of individuals actively engaged to come up with a common solution for a joint problem. The social systems in which an individual is involved can affect their overall behavior. The structure of the social system can cause uncertainty about different innovations presented to an individual (Rogers, 2003). For the purpose of this study, we focused on the innovation element of Diffusion of Innovation Theory.

The current study sought to create information needed to develop a new Extension program for beef producers (the innovation) prior to the diffusion process. The focus of innovations is the newness of the innovation to an individual. The Extension specialists’ mission is to provide their clients with new innovations. Innovations are perceived as new resources, techniques or new concepts that participants are interested in adopting (Meyer et al., 2018). Although an innovation might have obvious advantages to different individuals, their attitude is related to the rate of the adoption of the innovation (Rogers, 2003). The attributes of an innovation also relate to the adoption of the innovation (Rogers, 2003). These attributes are relative advantage, compatibility, complexity, trialability, and observability. Relative advantages and compatibility are the two elements that structured this study as the purpose of the study was to gather information about new ideas that aligned with the needs and values of participants in the study.
As defined by Rogers (2003), relative advantages comprise the degree to which innovation is perceived as better than the idea it supersedes. Individuals will adopt the innovation more quickly if they see the new innovation as better than what they currently have (Moore et al., 2012). Compatibility is the degree to which an innovation is perceived as being consistent with the values and needs of the adopters (Rogers, 2003). Individuals not only must feel that the innovation aligns with their past experiences but also with their needs and values (Murphrey & Dooley, 2000). Extension specialists must align past experiences that producers have with the new program material to assist them as they move forward.

Before creating a new beef curriculum, it is suggested that experts come to a consensus about the topics that should be included. Farm, Food and Enterprise Development has received several inquiries about new marketing aspects in the beef industry. By working with these experts and recognizing how often the beef industry is changing, field experts will be able to come to a consensus on a new value-added agricultural beef curriculum. The success of program improvements due to the innovative process as well as the ability to translate new ideas into Extension programs will strengthen the impact and value of the program (Meyer et al., 2018). Working with stakeholders or experts in the field will ensure the desired outcomes can be achieved (Stefaniak et al., 2018).

**Purpose and Objectives**

The purpose of this study was to identify competencies for a value-added agriculture beef curriculum. This study was guided by two objectives:

1. Describe field experts’ perceptions of the challenges that beef producers are facing regarding alternative marketing of beef; and

2. Identify the competencies needed in a new value-added beef Extension program.
Methods and Procedures

A modified Delphi study with three-rounds was utilized (Hasson & Keeney, 2011) for the purpose of having a group of field experts come to consensus on producer challenges and competencies that should be included in a value-added beef curriculum. We sought out to identify expert perceptions or the interpretations experts had about challenges and competencies. According to Ludwig (1997), the Delphi method is a combined qualitative and quantitative methodology designed to bring a group of people to consensus while allowing for individuals to “…generate and evaluate suggestions regarding opportunities, problems and planning strategies” (Linstone & Turoff, 1975). Additionally, this method enables Extension specialists to hear from many individuals to collect relevant feedback utilizing an inexpensive method across a wide geographical area (Mayfield et al., 2005). Unlike traditional planning meetings, this method allows for anonymity of responses and the sharing of ideas without direct interaction (Gross, 1981). By utilizing this method, we were able to explore different ideas suitable for the creation of a new value-added beef Extension program. Research methods received human subjects’ approval (IRB # 19-452, Appendix C).

Participants

Participants of this study were comprised of individuals who were in beef outreach education and producers with numerous years of beef production experience. The participants in this study had specific ties to the topic of value-added beef production and marketing curriculum (Linstone & Turoff, 1975). A nomination process was followed to identify experts who had the knowledge and experience base needed to provide the highest quality of information (Ludwig, 1997). We allowed all participants who were nominated to participate in this study to ensure that a minimum of 15–20 participants completed all three rounds of the study. Two Extension
personnel within the Farm, Food, and Enterprise Development Extension group nominated experts.

The two nominators had a combined total of 38 years of experience with small farm and value-added Extension programs and were familiar with other experts across the state of Iowa. The nominating personnel followed the criterion that participants in the study are either a beef education service provider or have been involved in value-added beef practices for at least 20 years. The nominators were given the criteria and asked to submit a list of the most qualified people to participate in the study. The nominators were instructed to submit as many qualified individuals as possible (Delbecq et al., 1975).

Participants in the study included 17 males (68%) and 8 females (32%), with an average of 27.36 years of being involved in the beef industry. The participants’ professions included those who were faculty (5 people, 20%), Extension specialists (7 people, 28%), industry education providers (4 people, 16%), and beef producers (9 people, 36%). Participants were from across the state of Iowa. As illustrated in Figure 3.1, the state of Iowa is divided into 20 regions.

There were 11 participants from Region 8, 4 participants from Region 13, 2 participants from Region 7, 3 participants from Region 18, 2 participants from Region 19, 1 participant from Region 2, 1 participant from Region 14, and 1 participant who covered Iowa statewide. When asked how often they were asked about value-added beef production, 9 participants had inquiries once a week, 4 participants had inquiries once a month, 3 participants had inquiries once a quarter, 3 participants had inquiries once every six months, 2 participants had inquiries once a year and 4 participants had never had inquiries about value-added beef production.
Figure 3.1. Extension Regions for the State of Iowa with circles noting Participant Locations. (ISUEO, 2019)

Data Collection

The data was collected in the Fall of 2019. Since Delphi methodology is qualitative in nature, we followed specific steps to ensure trustworthiness in the study. Credibility is the most important way to establish trustworthiness (Guba & Lincoln, 1994). We ensured credibility by following established research methods and by involving other people outside of the research team in the nomination process of the experts. Shento (2004) advised that one must establish transferability, similar to external validity, with other researchers by providing as much context detail as possible, such as how many organizations are involved in the study, the number of participants are in the study, a detailed description of the data collection method and process, the length of the instrument, and the time period of the data collection to ensure information may be transferable. To ensure dependability, we utilized an audit trail which is one of the best ways to
establish dependability (Ary, Jacobs, & Sorensen, 2010). Audit trails documents how, when, and why different items were completed in the study. Using an audit trail enables a third party to review the documents and confirm trustworthiness of the methods and analysis for the study. Confirmability, similarly to objectivity, refers to research bias. The audit trail was also utilized to ensure the research was free of bias (Ary et al., 2010).

To ensure the instrument was measuring what it was supposed to be (face validity), two value-added beef and Extension education experts who did not participate in the study reviewed the two open-ended questions utilized in round one to ensure that the wording could be understood by the participants. The second round and third round instruments were also reviewed by three individuals involved in Extension at Iowa State University to ensure familiar terminology was utilized in the instrument, all questions only asked one question, and that the competencies listed were aligned with the goal of the study.

**Round One**

The nominated participants received an informational email explaining the purpose of the study, a description of a three-round Delphi procedure, and a link to Qualtrics with the first-round instrument (Appendix A-1 and B-1). Including the instrument in the initial contact enabled us to capture participants’ interests (Delbecq et al., 1975). Participants had two weeks to complete the instrument as recommended by Delbecq et al. (1975). We provided two email reminders during this round following the communication guidelines established by Dillman, Symth, and Christian (2009). Communications with participants adhered to the following guidelines (Dillman et al., 2009):

1. Personalized emails to participants.
2. Varied content of the email to not replicate previous emails.
3. Emails were sent out at the beginning of the workday to match the participants work schedule.

4. Emails were not sent less than three days apart from one another.

The first round instrument included two open-ended questions:

1. *What challenges do beef producers face in regards to alternative production methods and marketing?*

2. *What competencies should be included in a value-added beef Extension program on alternative production methods and marketing?*

In addition, the participants were asked questions about their demographics such as biological sex, age, professional position, years in the beef industry, location in Iowa, and how often they were responding to inquiries in regards to value-added beef production (Hsu & Sandford, 2007).

**Round Two**

Items from the first round were gathered, summarized and put into a list for the second round instrument (Hsu & Sandford, 2007). The list gathered from the first round included two parts: (1) Potential Competencies, and (2) Challenges beef producers are facing. In both parts of the instrument, participants were asked to use a five-point Likert-type scale (1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly Agree) to indicate their level of agreeance to each part listed in the instrument created from the items gathered in round one (Appendix A-2 and B-2). To be considered consensus on the competencies there had to be at least 75% of the experts score an item 4 (Agree) or 5 (Strongly Agree). This criterion for consensus is similar to other studies in the field (Ramsey & Edwards, 2011; Jenkins & Kitchel, 2009).
Round Three

The nominated experts who participated in round one and two were sent a third email that included round three’s instrument (Appendix A-3 and B-3). This instrument included the competencies that were scored with either 4 (Agree) or 5 (Strongly Agree) by 75% of the participants in round two. In the third-round participants were asked “Is this competency important to be included in a value-added beef program?” Response options were yes or no. Consensus was determined at 90% agreeance. This criterion was set similarly to Easterly III & Myers (2017) study. Once the data were collected and analyzed, an email was sent to participants to share a summary of findings.

Data Analysis

Qualtrics was used to analyze the data. Open-ended responses from round one were analyzed by using the Constant Comparison Method by first removing duplicate responses (Ary, Jacobs & Sorensen, 2010). Then the responses were organized into different themes to create the second instrument. The demographic data were analyzed through percentages and were shared with participants in round two so that participants were aware of who was participating in the study with them. The data collected through the Likert-type scale questions in round two were analyzed through descriptive statistics with percentage analysis of the agreement. The competencies of the study were analyzed to determine if a consensus for inclusion in a new value-added beef curriculum had been reached. A copy of all email communication in round one, two, and three is provided in Appendix A.

Results

Round One

In the first round, 46 email invitations were sent to individuals who met our criteria to participate in the Delphi study. For the first round there was a response rate of 54.3% (25
participants out of 46 invites). Participants were asked two open-ended questions. The first questions asked, “What challenges do beef producers face in regard to alternative production methods and marketing?” Experts listed 53 challenges from the open-ended question in round one. After data collection, the answers were analyzed to ensure no repeat questions and no double barrel questions. From the analysis of question one, 53 items were listed to proceed to the round two instrument. Responses to the first question were organized into categories that included: Beef Industry Structure (5 items), Monetary (9 items); Marketing (18 items); Consumer (7 items); Resource (3 items); Regulation and Labeling (8 items); and Other Protein Source (3 items).

The second question asked in round one was “What competencies should be included in a value-added beef Extension program on alternative production methods and marketing?” Experts listed 22 items for the second question. Data were analyzed to ensure no repeat items and no double- barrel questions. From the 22 items listed from the experts, 31 items were identified to go into the second-round instrument. Responses to the second question were organized into the following categories: Foundations of Beef Production (6 items); Foundations of Value-Added Production (7 items); Tools for Producers (5 items); and Business and Marketing (13 items).

**Round Two**

In the second round, participants were asked to rate their agreement with items generated from round one. If the item had 75% of the participants rate the item of either agree (4) or strongly agree (5) it achieved consensus and was put into the third-round instrument. The 25 participants who completed round one were invited to complete the round two survey. The response rate for the second round was 84% (21 out of 25).

In part one of the study, participants were asked to rate their agreement of challenges beef producers were facing in the industry. Out of the 53 challenges listed, 28 challenges (52.8%)
achieved consensus of being challenges beef producers face regarding alternative production methods and marketing (Table 3.1). All categories that were created from the round one items, were represented in the items that achieved consensus from the participants.

Table 3.1. Challenges from Round Two Instrument (n=21).

<table>
<thead>
<tr>
<th>Challenges</th>
<th>Category</th>
<th>Strongly Agree/ Agree (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Proper knowledge of laws and regulations and how to pass them onto producers.</td>
<td>Regulation and Labeling</td>
<td>100^a</td>
</tr>
<tr>
<td>2. Producers’ availability of small federally inspected lockers.</td>
<td>Resource</td>
<td>95^a</td>
</tr>
<tr>
<td>3. Market accessibility for products that have a very limited shelf life that may have many food safety challenges.</td>
<td>Marketing</td>
<td>95^a</td>
</tr>
<tr>
<td>4. Volume produced due to diverse type and kind of cattle produced is variable.</td>
<td>Beef Industry Structure</td>
<td>91^a</td>
</tr>
<tr>
<td>5. With direct marketing programs such as freezer beef, there’s a greater labor and input costs along with logistical challenges.</td>
<td>Monetary</td>
<td>91^a</td>
</tr>
<tr>
<td>6. Producers being able to have consistent availability of their product.</td>
<td>Marketing</td>
<td>91^a</td>
</tr>
<tr>
<td>7. Producers competing with CRP payments and pasture rent.</td>
<td>Resource</td>
<td>91^a</td>
</tr>
<tr>
<td>8. Input costs to establish a product by changing production and enhancing the value through differentiated marketing.</td>
<td>Monetary</td>
<td>86^a</td>
</tr>
<tr>
<td>9. Producers having a small segment of the market that will pay a premium to the producer that covers additional expenses for the value-added product.</td>
<td>Marketing</td>
<td>86^a</td>
</tr>
<tr>
<td>10. Producers having a place to market their product and supplying the markets.</td>
<td>Marketing</td>
<td>86^a</td>
</tr>
<tr>
<td>11. There are greater costs associated with most alternative production methods. For example: less gain and feed efficiency due to not utilizing technologies such as implants.</td>
<td>Monetary</td>
<td>86^a</td>
</tr>
<tr>
<td>12. Producers being able to find a consistent and profitable market that offers premiums for their product.</td>
<td>Marketing</td>
<td>86^a</td>
</tr>
<tr>
<td>13. Location of the markets can be a challenge. (i.e. Markets of value-added ag are in larger cities so producers must ship their products. Navigating how to ship perishable products out of town can be challenging).</td>
<td>Marketing</td>
<td>85^a</td>
</tr>
<tr>
<td>14. Limited accessibility to USDA inspectors limiting the ability to sell product out of state.</td>
<td>Regulation and Labeling</td>
<td>85^a</td>
</tr>
<tr>
<td>15. Producers competing with other commodity products while distinguishing their product from others.</td>
<td>Other Protein Sources</td>
<td>85^a</td>
</tr>
<tr>
<td>16. Understanding and matching the product to what the consumer would like. For example, not everyone wants a 16” ribeye.</td>
<td>Consumer</td>
<td>85^a</td>
</tr>
<tr>
<td>17. Sector differentiation may lead to challenges when providing information on production practice verification for value-added labeling.</td>
<td>Beef Industry Structure</td>
<td>81^a</td>
</tr>
<tr>
<td>Challenges</td>
<td>Category</td>
<td>Strongly Agree/Agree (%)</td>
</tr>
<tr>
<td>---------------------------------------------------------------------------</td>
<td>---------------------------------</td>
<td>--------------------------</td>
</tr>
<tr>
<td>18. Overall cost of production for specialized programs and branding of</td>
<td>Monetary</td>
<td>81&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>their products.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19. Limited existing market outlets for producers.</td>
<td>Marketing</td>
<td>81&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>20. Having variability of the product even under consistent management</td>
<td>Marketing</td>
<td>81&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>practices.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>21. Consumer education on how their cattle are raised, priced, and</td>
<td>Consumer</td>
<td>81&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>prepared to cook different cuts of meat.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>22. Ensuring food safety and compliance with USDA rules related to</td>
<td>Regulation and Labeling</td>
<td>80&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>direct marketing.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>23. Producers determining price based off their production costs vs. no</td>
<td>Monetary</td>
<td>76&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>knowledge of production costs.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24. Producers having a viable market when dealing with the beef</td>
<td>Marketing</td>
<td>76&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>industry's long production cycle.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25. Producers having case ready product management expertise.</td>
<td>Marketing</td>
<td>76&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>26. Confidence in the chosen value-added marketing strategy that the</td>
<td>Marketing</td>
<td>76&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>producer selected as it may take extra time to see a return.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>27. Quality and taste differences associated with grass finishing beef.</td>
<td>Consumer</td>
<td>76&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>28. Producers expanding beyond direct markets.</td>
<td>Marketing</td>
<td>75&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>29. Iowans as a whole don’t consume much grass fed/ finished beef.</td>
<td>Consumer</td>
<td>71</td>
</tr>
<tr>
<td>30. Producers have limited feed resources such as pasture and hay</td>
<td>Resource</td>
<td>71</td>
</tr>
<tr>
<td>along with overall land availability to producers.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>31. Longer production cycles and higher start-up costs in value-added</td>
<td>Monetary</td>
<td>71</td>
</tr>
<tr>
<td>production that don’t match with standard agricultural funding</td>
<td></td>
<td></td>
</tr>
<tr>
<td>schedules.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>32. Determining appropriate size of an operation to have a sustainable</td>
<td>Marketing</td>
<td>70</td>
</tr>
<tr>
<td>market.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>33. Long process of labeling through the USDA.</td>
<td>Regulation and Labeling</td>
<td>70</td>
</tr>
<tr>
<td>34. Challenge of having a consistent and steady supply of animals. (i.e.</td>
<td>Beef Industry Structure</td>
<td>67</td>
</tr>
<tr>
<td>how do you maintain a short calving season but still meet the demand of</td>
<td></td>
<td></td>
</tr>
<tr>
<td>year-round grass finished beef?)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>35. Developing a marketing strategy based on the number of head of cattle</td>
<td>Marketing</td>
<td>67</td>
</tr>
<tr>
<td>the operation has.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>36. The difficulty level and time consumption relating to understanding</td>
<td>Marketing</td>
<td>67</td>
</tr>
<tr>
<td>marketing strategies and marketing effectively.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>37. Producers having advertising and business skills to produce retail.</td>
<td>Marketing</td>
<td>67</td>
</tr>
<tr>
<td>38. Having the knowledge and understanding of different consumer trends</td>
<td>Marketing</td>
<td>67</td>
</tr>
<tr>
<td>and how that effects the producers overall market options.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>39. People assume things are comfortable to humans are the same for</td>
<td>Consumer</td>
<td>67</td>
</tr>
<tr>
<td>livestock.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>40. Proper production methods such as grass finishing, timing</td>
<td>Beef Industry Structure</td>
<td>66</td>
</tr>
<tr>
<td>production with the harvest date.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 3.1. (Continued).

<table>
<thead>
<tr>
<th>Challenges</th>
<th>Category</th>
<th>Strongly Agree/Agree (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>41. Markets such as grass finished beef markets, don’t return enough</td>
<td>Monetary</td>
<td>62</td>
</tr>
<tr>
<td>profit to producers to justify the longer production time required.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>42. Producers having delivery skills for the product.</td>
<td>Marketing</td>
<td>62</td>
</tr>
<tr>
<td>43. Consumers are misinformed about the product.</td>
<td>Consumer</td>
<td>62</td>
</tr>
<tr>
<td>44. Having new ready to eat products for consumers.</td>
<td>Consumer</td>
<td>62</td>
</tr>
<tr>
<td>45. Traceability back to the farm.</td>
<td>Regulation and Labeling</td>
<td>60</td>
</tr>
<tr>
<td>46. Initial capital investment and other costs associated with a start-up</td>
<td>Monetary</td>
<td>57</td>
</tr>
<tr>
<td>for a new value-added venture are prohibitive for producers.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>47. Producers must do more with less and lower the cost of production.</td>
<td>Monetary</td>
<td>57</td>
</tr>
<tr>
<td>48. The production side of the beef industry is independent and diverse</td>
<td>Beef Industry Structure</td>
<td>57</td>
</tr>
<tr>
<td>in regard to sector affiliation (cow-calf vs backgrounder vs feedlot).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>49. Communication between state and federal inspectors.</td>
<td>Regulation and Labeling</td>
<td>55</td>
</tr>
<tr>
<td>50. Other producers false labeling their products. For example, producers</td>
<td>Regulation and Labeling</td>
<td>50</td>
</tr>
<tr>
<td>putting labels on their product that haven’t been approved by the USDA.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>51. The competition from imported products.</td>
<td>Other Protein Sources</td>
<td>40</td>
</tr>
<tr>
<td>52. Changes to the systems currently in place for production.</td>
<td>Regulation and Labeling</td>
<td>36</td>
</tr>
<tr>
<td>53. The demand for synthetic meats and alternative protein sources.</td>
<td>Other Protein Sources</td>
<td>35</td>
</tr>
</tbody>
</table>

* Item achieved consensus

For part two of the instrument, participants were to indicate their level of agreement as to whether the item listed in the instrument should be included as a competency for a value-added beef Extension program. Out of the 31 items that were listed in the instrument, 21 items (67.7%) reached consensus (Table 3.2). All the categories created in round one for the items generated by the participants were represented in the items that achieved consensus in this round.
Table 3.2. Competencies from Round Two Instrument (n=21).

<table>
<thead>
<tr>
<th>Competencies</th>
<th>Category</th>
<th>Strongly Agree/Agree (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Cost management of the operation.</td>
<td>Business and Marketing</td>
<td>100&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>2. Forage management strategies.</td>
<td>Foundations of Beef Production</td>
<td>95&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>3. Labeling regulations and requirements for shipping across state lines.</td>
<td>Foundations of Value Added Production</td>
<td>95&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>4. Record keeping tools and software to assist in tracking production costs.</td>
<td>Tools</td>
<td>95&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>5. Regulations regarding transportation of livestock and meat products.</td>
<td>Foundations of Beef Production</td>
<td>90&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>6. Marketing and budgeting lessons that include break-even details.</td>
<td>Business and Marketing</td>
<td>90&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>7. Details on shipping perishable value-added products to consumers.</td>
<td>Foundations of Value Added Production</td>
<td>85&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>8. Decision tools for cattle performance, economic/price outlook, etc.</td>
<td>Tools</td>
<td>85&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>9. Science based research to learn about the details of different production methods.</td>
<td>Tools</td>
<td>85&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>10. Business planning including details of products, timeframes, and investment requirements.</td>
<td>Business and Marketing</td>
<td>85&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>11. Basic animal nutrition, health and husbandry practices.</td>
<td>Foundations of Beef Production</td>
<td>80&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>12. Regulations of animal harvesting.</td>
<td>Foundations of Beef Production</td>
<td>80&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>13. Define the various value-added programs and describe the criteria to be qualified for the specific program.</td>
<td>Foundations of Value Added Production</td>
<td>80&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>14. Identify different government programs and how a producer could utilize them in their operation.</td>
<td>Foundations of Value Added Production</td>
<td>80&lt;sup&gt;ab&lt;/sup&gt;</td>
</tr>
<tr>
<td>15. Specific production practices aligned with the marketing strategy.</td>
<td>Foundations of Value Added Production</td>
<td>80&lt;sup&gt;ab&lt;/sup&gt;</td>
</tr>
<tr>
<td>16. Diet formulation skills to match production goals.</td>
<td>Foundations of Beef Production</td>
<td>75&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>17. Describe the advantages and disadvantages of using alternative production methods and marketing strategies.</td>
<td>Foundations of Value Added Production</td>
<td>75&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
</tbody>
</table>
Table 3.2. (Continued).

<table>
<thead>
<tr>
<th>Competencies</th>
<th>Category</th>
<th>Strongly Agree/Agree (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>18. Details of consumer trends and preferences.</td>
<td>Business and Marketing</td>
<td>75&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>19. Basics of ag economics and marketing.</td>
<td>Business and Marketing</td>
<td>75&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>20. Information on how to market your brand.</td>
<td>Business and Marketing</td>
<td>75&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>21. How to market to niche markets.</td>
<td>Business and Marketing</td>
<td>75&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>22. New technology to better time marketing of cattle such as carcass ultrasound.</td>
<td>Tools</td>
<td>70</td>
</tr>
<tr>
<td>23. Details of supply and demand in value-added production.</td>
<td>Business and Marketing</td>
<td>70</td>
</tr>
<tr>
<td>24. Market analysis on the different types of production methods (alternative methods vs traditional methods).</td>
<td>Business and Marketing</td>
<td>70</td>
</tr>
<tr>
<td>25. Learn basic conventional beef production practices to understand what and why things are done that way.</td>
<td>Foundations of Beef Production</td>
<td>65</td>
</tr>
<tr>
<td>26. Market analysis of Iowa and different marketing regions.</td>
<td>Business and Marketing</td>
<td>65</td>
</tr>
<tr>
<td>27. Funding opportunities and deadlines to match the value-added beef production cycle.</td>
<td>Foundations of Value Added Production</td>
<td>60</td>
</tr>
<tr>
<td>28. Benchmarking and forward contracting.</td>
<td>Business and Marketing</td>
<td>60</td>
</tr>
<tr>
<td>29. Identifying, evaluating, and protecting marketing value of products.</td>
<td>Business and Marketing</td>
<td>60</td>
</tr>
<tr>
<td>31. Stability of information and programming.</td>
<td>Tools</td>
<td>50</td>
</tr>
</tbody>
</table>

<sup>a</sup> Item achieved consensus. <sup>b</sup> Item achieved consensus but was mistakenly not moved forward to the next round.

**Round Three**

In round three, 21 participants who completed both round one and two were surveyed. There was a response rate of 90.47% (19 out of 21). The third-round participants were asked to confirm if they agreed that the item listed in the instrument was an important challenge/competency by answering yes or no. Items given a yes by 90% or more of the participants achieved consensus. For the challenges, 13 (46.4%) of 28 items were rated 90% or higher (Table
3.3). Items from the categories of Beef Industry Structure, Monetary, Marketing, Consumers, Resources, and Regulation and Labeling were represented from the items that were confirmed by the study’s participants to being important challenges beef producers are facing in regards to alternative marketing and production. The category “Other Protein Sources” was the only category not represented in the third round’s data of confirmed items.

Table 3.3. Challenges from Round Three Instrument (n=19).

<table>
<thead>
<tr>
<th>Challenges</th>
<th>Category</th>
<th>Yes (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Producers being able to find a consistent and profitable market that offers premiums for their product.</td>
<td>Marketing</td>
<td>100</td>
</tr>
<tr>
<td>2. Producers’ availability of small federally inspected lockers.</td>
<td>Resource</td>
<td>95</td>
</tr>
<tr>
<td>3. There are greater costs associated with most alternative production methods. For example: less gain and feed efficiency due to not utilizing technologies such as implants.</td>
<td>Monetary</td>
<td>95</td>
</tr>
<tr>
<td>4. With direct marketing programs such as freezer beef, there’s a greater labor and input costs along with logistical challenges.</td>
<td>Monetary</td>
<td>90</td>
</tr>
<tr>
<td>5. Producers being able to have consistent availability of their product.</td>
<td>Marketing</td>
<td>90</td>
</tr>
<tr>
<td>6. Producers having a small segment of the market that will pay a premium to the producer that covers additional expenses for the value-added product.</td>
<td>Marketing</td>
<td>90</td>
</tr>
<tr>
<td>7. Producers having a place to market their product and supplying the markets.</td>
<td>Marketing</td>
<td>90</td>
</tr>
<tr>
<td>8. Location of the markets can be a challenge. (i.e. Markets of value-added ag are in larger cities so producers must ship their products. Navigating how to ship perishable products out of town can be challenging).</td>
<td>Marketing</td>
<td>90</td>
</tr>
<tr>
<td>9. Limited accessibility to USDA inspectors limiting the ability to sell product out of state.</td>
<td>Regulation and Labeling</td>
<td>90</td>
</tr>
<tr>
<td>10. Sector differentiation may lead to challenges when providing information on production practice verification for value-added labeling.</td>
<td>Beef Industry Structure</td>
<td>90</td>
</tr>
<tr>
<td>11. Overall cost of production for specialized programs and branding of their products.</td>
<td>Monetary</td>
<td>90</td>
</tr>
<tr>
<td>12. Consumer education on how their cattle are raised, priced, and prepared to cook different cuts of meat.</td>
<td>Consumer</td>
<td>90</td>
</tr>
<tr>
<td>13. Ensuring food safety and compliance with USDA rules related to direct marketing.</td>
<td>Regulation and Labeling</td>
<td>90</td>
</tr>
<tr>
<td>14. Proper knowledge of laws and regulations and how to pass them onto producers.</td>
<td>Regulation and Labeling</td>
<td>84</td>
</tr>
<tr>
<td>15. Input costs to establish a product by changing production and enhancing the value through differentiated marketing.</td>
<td>Monetary</td>
<td>84</td>
</tr>
<tr>
<td>16. Understanding and matching the product to what the consumer would like. For example, not everyone wants a 16” ribeye.</td>
<td>Consumer</td>
<td>84</td>
</tr>
</tbody>
</table>
Table 3.3 (Continued).

<table>
<thead>
<tr>
<th>Challenges</th>
<th>Category</th>
<th>Yes (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>17. Limited existing market outlets for producers.</td>
<td>Marketing</td>
<td>84</td>
</tr>
<tr>
<td>18. Producers determining price based off their production costs vs. no knowledge of production costs.</td>
<td>Monetary</td>
<td>84</td>
</tr>
<tr>
<td>19. Producers having case ready product management expertise.</td>
<td>Marketing</td>
<td>84</td>
</tr>
<tr>
<td>20. Quality and taste differences associated with grass finishing beef.</td>
<td>Consumer</td>
<td>84</td>
</tr>
<tr>
<td>21. Market accessibility for products that have a very limited shelf life that may have many food safety challenges.</td>
<td>Marketing</td>
<td>79</td>
</tr>
<tr>
<td>22. Volume produced due to diverse type and kind of cattle produced is variable.</td>
<td>Beef Industry Structure</td>
<td>79</td>
</tr>
<tr>
<td>23. Producers having a viable market when dealing with the beef industry's long production cycle.</td>
<td>Marketing</td>
<td>79</td>
</tr>
<tr>
<td>24. Having variability of the product even under consistent management practices.</td>
<td>Marketing</td>
<td>74</td>
</tr>
<tr>
<td>25. Confidence in the chosen value-added marketing strategy that the producer selected as it may take extra time to see a return.</td>
<td>Marketing</td>
<td>74</td>
</tr>
<tr>
<td>26. Producers expanding beyond direct markets.</td>
<td>Marketing</td>
<td>74</td>
</tr>
<tr>
<td>27. Producers competing with CRP payments and pasture rent.</td>
<td>Resource</td>
<td>72</td>
</tr>
<tr>
<td>28. Producers competing with other commodity products while distinguishing their product from others.</td>
<td>Other Protein Sources</td>
<td>58</td>
</tr>
</tbody>
</table>

a Item achieved consensus.

For part two of the instrument, participants were asked to answer yes or no to if they agree the competencies listed were important to be included in a value-added beef Extension program. The participants had a total of 19 items to rate and 9 items (47.3%) were confirmed that they were important (Table 3.4). All categories created in round one were represented in the items that were confirmed important in this round.

**Discussion**

Beef related Extension programs currently focus on more traditional production and marketing aspects of the industry. The Iowa Beef Center provides traditional production focused operation tools to Iowans in the following areas: cattle health and wellbeing, cow-calf management, economics and management, environmental management, facilities, feedlot
Table 3.4. Competencies from Round Three Instrument (n=19).

<table>
<thead>
<tr>
<th>Competencies</th>
<th>Category</th>
<th>Yes (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Cost management of the operation.</td>
<td>Business and Marketing</td>
<td>100(^a)</td>
</tr>
<tr>
<td>2. Labeling regulations and requirements for shipping across state lines.</td>
<td>Foundations of Value Added Production</td>
<td>100(^a)</td>
</tr>
<tr>
<td>3. Business planning including details of products, timeframes, and investment requirements.</td>
<td>Business and Marketing</td>
<td>100(^a)</td>
</tr>
<tr>
<td>4. Forage management strategies.</td>
<td>Foundations of Beef Production</td>
<td>95(^a)</td>
</tr>
<tr>
<td>5. Record keeping tools and software to assist in tracking production costs.</td>
<td>Tools</td>
<td>95(^a)</td>
</tr>
<tr>
<td>6. Regulations regarding transportation of livestock and meat products.</td>
<td>Foundations of Beef Production</td>
<td>95(^a)</td>
</tr>
<tr>
<td>7. Marketing and budgeting lessons that include break-even details.</td>
<td>Business and Marketing</td>
<td>90(^a)</td>
</tr>
<tr>
<td>8. Details on shipping perishable value-added products to consumers.</td>
<td>Foundations of Value Added Production</td>
<td>90(^a)</td>
</tr>
<tr>
<td>9. Decision tools for cattle performance, economic/ price outlook, etc.</td>
<td>Tools</td>
<td>90(^a)</td>
</tr>
<tr>
<td>10. Science based research to learn about the details of different production methods.</td>
<td>Tools</td>
<td>84</td>
</tr>
<tr>
<td>11. Basic animal nutrition, health and husbandry practices.</td>
<td>Foundations of Beef Production</td>
<td>84</td>
</tr>
<tr>
<td>12. Regulations of animal harvesting.</td>
<td>Foundations of Beef Production</td>
<td>84</td>
</tr>
<tr>
<td>13. Describe the advantages and disadvantages of using alternative production methods and marketing strategies.</td>
<td>Foundations of Value Added Production</td>
<td>84</td>
</tr>
<tr>
<td>14. Basics of ag economics and marketing.</td>
<td>Business and Marketing</td>
<td>84</td>
</tr>
<tr>
<td>15. Information on how to market your brand.</td>
<td>Business and Marketing</td>
<td>84</td>
</tr>
<tr>
<td>16. How to market to niche markets.</td>
<td>Business and Marketing</td>
<td>84</td>
</tr>
<tr>
<td>17. Details of consumer trends and preferences.</td>
<td>Business and Marketing</td>
<td>79</td>
</tr>
<tr>
<td>18. Diet formulation skills to match production goals.</td>
<td>Foundations of Beef Production</td>
<td>68</td>
</tr>
<tr>
<td>19. Define the various value-added programs and describe the criteria to be qualified for the specific program.</td>
<td>Foundations of Value Added Production</td>
<td>63</td>
</tr>
</tbody>
</table>

\(^a\) Item achieved consensus.

management, feedstuffs, forage/ grazing management, and stocker/backgrounder management (Iowa Beef Center, 2020). As revealed in this study, experts agreed there were 13 specific challenges that beef producers are facing in the categories of Marketing, Resource, Monetary, Regulation and Labeling, Beef Industry Structure and Consumers. They also suggested that 9
competencies in the categories of Business and Marketing, Foundations of Value-Added Production, Foundations of Beef Production and Tools need to be included a new value-added beef Extension program. The producer challenges and the competencies identified by experts do not align with current Extension programming that focus on traditional marketing and production. Although the Farm, Food and Enterprise Development Extension group also serves Iowa beef producers by providing alternative marketing and production resources, this group serves producers through newsletters and on an individual basis. The individual base response though it does align with the suggested items from this study, it still lacks the items suggested from this specific study.

This study aligns with previous research that has shown the value of needs assessment studies such as this one. Similar to this study, other researchers have shown that the Delphi technique is an effective way of identifying needs for a variety of Extension programs (Polush et al., 2016; Strohbehn et al., 2018). Strohbehn et al. (2018) noted that it was important to identify the needs directly from producers instead of assuming the delivery method preference and the information need. These similar studies emphasize the importance of identifying needs of the audiences Extension personnel are working with to provide appropriate information through outreach programming. This study provides foundational information for Extension personnel to use in creating a value-added beef Extension program. The Delphi survey provided valuable informational data collected directly from experts in the beef industry. These participants work with producers daily and understand what is needed to build a new Extension program.

Results from this study align with what is happening in the beef industry today. In today’s beef industry, cattle prices are down but beef prices from packers are high due to packer capacity, beef supply, feedlot marketing, etc. (Crosby, 2020). As experts have seen trends of
traditional marketing not benefiting beef producers, the data from this study suggest that it is more important to learn about the business aspects such as cost management, product shipping regulations, and business planning. Cattle producers must understand the different opportunities for marketing and production to make the best decision for their operation. However, there are no resources or programming for producers wanting to start direct marketing, create a nontraditional business plan, or learn more about alternative production practices they could implement in their own operation.

The data gathered from this study provide a foundation for a new program that is currently needed by beef producers in Iowa. Table 3.5 provides a framework for the new program. The framework organizes the program into modules, includes a list of competencies for each module, and identifies selected challenges addressed by the competencies. Although the experts were asked to identify competencies, they actually identified topics that were translated by the researchers into specific and measurable competencies. The challenges that were also gathered from the experts can be included into the different modules through providing new pieces of information or tools that can help relieve the challenges that producers are facing.

**Limitations**

The study was limited to Iowa beef industry experts and experienced beef producers in the field who identified competencies they perceived would be a positive addition to a value-added beef Extension program and curriculum. Therefore, the findings are not generalizable to other states or different groups of experts in the field. The data gathered from this study are unique to the group of participants in the study and their experiences within the Iowa beef industry. Other data points could have been discovered with a different group of participants based on their interactions in the beef industry and their overall expertise.
Table 3.5. Framework for a New Value-Added Beef Extension Program.

<table>
<thead>
<tr>
<th>Module</th>
<th>Competencies</th>
<th>Challenges to consider Addressing</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1.1. Apply different business planning strategies to manage cost of the operation</td>
<td>1.1. Being able to find a consistent and profitable market that offers premiums for their product</td>
</tr>
<tr>
<td></td>
<td>1.2. Recognize the details of a generic business plan for beef operations</td>
<td>1.2. Having a small segment of the market that will pay a premium to the producer that covers additional expenses for the value-added product</td>
</tr>
<tr>
<td></td>
<td>1.3. Produce an example business plan for a beef operation</td>
<td>1.3. Having a place to market their product and supplying the markets</td>
</tr>
<tr>
<td></td>
<td>1.4. Outline different business plans with specific timeframes</td>
<td>1.4. Location of the markets can be a challenge. (i.e., Markets of value-added agriculture are in larger cities so producers must ship their products. Navigating how to ship perishable products out of town can be challenging)</td>
</tr>
<tr>
<td></td>
<td>1.5. Analyze different investment requirements for your new or expanding business</td>
<td>1.5. Sector differentiation may lead to challenges when providing information on production practice verification for value-added labeling</td>
</tr>
<tr>
<td></td>
<td>1.6. Summarize break-even details</td>
<td>1.6. Overall cost of production for specialized programs and branding of their products</td>
</tr>
<tr>
<td></td>
<td>1.7. Identify beef marketing strategies</td>
<td>1.7. Consumer education on how their cattle are raised, priced, and prepared to cook different cuts of meat.</td>
</tr>
<tr>
<td></td>
<td>1.8. Practice beef operation’s budgeting</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.9. Critique a break-even budget</td>
<td></td>
</tr>
<tr>
<td>2. Foundations of Value-Added Production</td>
<td>2.1. Explain the labeling regulation details of meat products</td>
<td>2.1. Availability of small federally inspected lockers that limit ability to sell out of state</td>
</tr>
<tr>
<td></td>
<td>2.2. Summarize the requirements for shipping product across state lines.</td>
<td>2.2 Logical challenges with direct marketing</td>
</tr>
<tr>
<td></td>
<td>2.3. Describe the details on shipping perishable value-added products to consumers.</td>
<td>2.3. Have consistent availability of their product</td>
</tr>
<tr>
<td>3. Foundations of Beef Production</td>
<td>3.1. Summarize the basics of forage management strategies</td>
<td>2.4. Ensuring food safety and compliance with USDA rules related to direct marketing.</td>
</tr>
<tr>
<td></td>
<td>3.2. Compare and contrast forage management strategies.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3.3. Apply different forage management strategy plans to your own operation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3.4. Describe regulations regarding transportation (movement) of livestock</td>
<td></td>
</tr>
</tbody>
</table>

- Table content reflects the competencies and challenges to consider for a new value-added beef extension program.
Table 3.5. (Continued).

<table>
<thead>
<tr>
<th>Module</th>
<th>Competency</th>
<th>Challenges to consider Addressing</th>
</tr>
</thead>
<tbody>
<tr>
<td>4. Tools</td>
<td>4.1. Identify record keeping tools that are available to assist in tracking production costs.</td>
<td>N/A</td>
</tr>
<tr>
<td>4.2. Demonstrate the use of record keeping tools for tracking production costs with example records</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.3. Recall the basic details of decision tools for cattle performance, economic/ price outlook, etc.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.4 Analyze cattle performance through using decision tools</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.5 Interpret economic/ price outlook through using decision tools</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Conclusions and Recommendations**

The following are key findings from the study:

- According to Iowa beef industry experts, the foundation of a new Extension program should include competencies that focus on foundational knowledge of alternative production and more tools for a nontraditional business plan.

- Challenges that experts have heard from beef producers relate to business and marketing items and the lack of resources for producers.

- There is a need for programming that focuses on the business aspect of nontraditional producers.

The following recommendations are made for further research by Extension education researchers:

- This study’s limitation is that the data collected were from one group of beef experts who interact with producers. Further research is needed to determine whether beef producers are interested in programming derived from this study.
• Further research is needed to discover the best way to promote adoption of the program through the innovation decision process.

• Program evaluation is needed to ensure the effectiveness of any innovation that is created from this study.

The following recommendation are made for practice by Extension personnel:

• From the framework created, we recommend developing a curriculum using an appropriate curriculum development model. This will allow Extension personnel to align the competencies to the delivery method and the short-, medium- and long-term outcomes.

• Once the innovation of a value-added beef Extension program has been made, a program evaluation protocol should be created. This will allow Extension personnel to measure if the objectives of the curriculum have been met.

References


**Appendix A. Delphi Emails**

**A-1. Round One**

**Initial Email**

Value-Added Beef Extension Program Study

Dear [Name]

As you know, beef commodity prices have been trending downward. The overall outlook for agriculture has many farmers looking at opportunities in value-added agriculture. The Farm, Food and Enterprise Development Extension and Outreach program is looking to expand a past curriculum on value-added beef production. The purpose of this study is to help us have a better understanding as to what should be included in the expanded curriculum. Your name was provided as an individual with expertise in beef production and as such, I am inviting you to participate in a Delphi study.

This study is made up of three rounds of questionnaires. The first round will start by asking you demographic questions and two open ended questions. This round will take you about 20-25 minutes. The second round’s questionnaire will ask you to rate the ideas generated in the first round on their importance for a new value added beef curriculum. The third round will ask you to confirm the items that are important as it relates to the new Extension program.

This study is completely voluntary and you may stop at any point throughout the process. All responses to this study will be confidential and any data that is shared will be anonymous.

For any questions about this study, please feel free to contact Sarah Smith (sjalmaz@iastate.edu) or Dr. Greg Miller (gsmiller@iastate.edu).

To begin the first round of this study please click here: [Qualtrics Link]

Thank you for your time and willingness to participate in this study.

Sincerely,

**Sarah Smith**
Agricultural Education Doctoral Student
Iowa State University

**Dr. Greg Miller**
Professor of Agricultural Education
Iowa State University
Reminder Email - One
Value-Added Beef Extension Program Study

Dear (Name),

Last week you received a letter in regards to your participation in a study to brainstorm items for a new value added beef Extension program for the state of Iowa.

If you have already completed the online questionnaire in round one of the study, please accept our sincerest thanks. If you have not completed the questionnaire, please do so today. This questionnaire will only take 20-25 minutes. We are grateful for your help as it is only through working with people such as yourself that we can better understand what are the most important items to be included in a new value added beef Extension program.

For any questions about this study, please feel free to contact Sarah Smith (sjalmaz@iastate.edu) or Dr. Greg Miller (gsmiller@iastate.edu).

To access the questionnaire, please click here: [Qualtrics Link]

Thank you very much for your participation.

Sincerely,

Sarah Smith
Agricultural Education Doctoral Student
Iowa State University

Dr. Greg Miller
Professor of Agricultural Education
Iowa State University

Reminder Email - Two
Value-Added Beef Extension Program Study

Dear (Name),

Almost two weeks ago, you received an email requesting your participation in a study to brainstorm items for a new value added beef Extension program. As of today, we have not received your completed survey. Round One has 8 questions and will only take you about 20-25 minutes to complete.

For any questions about this study, please feel free to contact Sarah Smith (sjalmaz@iastate.edu) or Dr. Greg Miller (gsmiller@iastate.edu).

To begin the first round, please click here: [Qualtrics Link]

Sincerely,

Sarah Smith
Agricultural Education Doctoral Student
Iowa State University

Dr. Greg Miller
Professor of Agricultural Education
Iowa State University
A-2. Round Two

Value-Added Beef Extension Program Study Round Two

Initial Email

Dear (Name),

Thank you for participating in the first round of the Value Added Beef Extension Program research study being conducted by Iowa State University Extension and Outreach. After round one, participants identified 53 challenges that beef producers face with alternative production methods and marketing and 31 potential competencies for a value added beef Extension program. Please take a moment to rate the importance of the identified items from round one. Items were categorized in the survey based on commonality and listed in no particular order. This will only take you 15-20 minutes.

For any questions about this study, please feel free to contact Sarah Smith (sjalmaz@iastate.edu) or Dr. Greg Miller (gsmiller@iastate.edu).

To begin the second round, please click here: [Qualtrics Link]

Sincerely,

Sarah Smith
Agricultural Education Doctoral Student
Iowa State University

Dr. Greg Miller
Professor of Agricultural Education
Iowa State University

Reminder Email- One

Value-Added Beef Extension Program Study Round Two

Dear (Name),

Last week, we sent you an email requesting your participation to rate the importance of value added beef items that were collected from Round One of the Value Added Beef Delphi research study. If you have already completed the online questionnaire in round two of the study, please accept our sincerest thanks. If you have not completed the questionnaire, please complete the questionnaire today. We are grateful for your help as it is only through working with people such as yourself that we can better understand what are the most important items to be included in a new value added beef Extension program.

For any questions about this study, please feel free to contact Sarah Smith (sjalmaz@iastate.edu) or Dr. Greg Miller (gsmiller@iastate.edu).

We hope you will complete this questionnaire today. To complete the questionnaire, please click here: [Qualtrics Link]

Sincerely,

Sarah Smith
Agricultural Education Doctoral Student
Iowa State University

Dr. Greg Miller
Professor of Agricultural Education
Iowa State University
**Reminder Email- Two**

Value-Added Beef Extension Program Study Round Two

Dear (Name),

Almost two weeks ago, you received an email requesting your participation in a study to rate the importance of items that were generated in Round One that relate to a new value added beef Extension program. As of today, we have not received your completed survey. Round Two will only take you about 15-20 minutes to complete.

For any questions about this study, please feel free to contact Sarah Smith (sjalmaz@iastate.edu) or Dr. Greg Miller (gsmiller@iastate.edu).

We hope you will complete this questionnaire today. To complete the questionnaire, please click here: [Qualtrics Link]

Sincerely,

Sarah Smith  
Agricultural Education Doctoral Student  
Iowa State University

Dr. Greg Miller  
Professor of Agricultural Education  
Iowa State University

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**A-3. Round Three**

**Initial Email**

Value-Added Beef Extension Program Study Round Three

Dear (Name),

Thank you for participating in the second round of the Value Added Beef Extension Program research study. The final part of this study is to look at the items that made consensus from round two to confirm if these items are important items to be included in the creation of a new Extension program.

For any questions about this study, please feel free to contact Sarah Smith (sjalmaz@iastate.edu) or Dr. Greg Miller (gsmiller@iastate.edu).

To begin the final round, please click here: [Qualtrics Link]

Sincerely,

Sarah Smith  
Agricultural Education Doctoral Student  
Iowa State University

Dr. Greg Miller  
Professor of Agricultural Education  
Iowa State University

---

**Reminder Email- One**

Dear (Name),

As of today, we have not received your completed questionnaire. Your expert opinion is very valuable to help us create a new value added beef program.
We are grateful for your help as it is only through working with people such as yourself that we can better understand what are the most important items to be included in a new value added beef Extension program. The final round will take you 15 minutes to complete.

For any questions about this study, please feel free to contact Sarah Smith (sjalmaz@iastate.edu) or Dr. Greg Miller (gsmiller@iastate.edu).

To begin the final round, please click here: [Qualtrics Link]

Sincerely,

Sarah Smith
Agricultural Education Doctoral Student
Iowa State University

Dr. Greg Miller
Professor of Agricultural Education
Iowa State University

Reminder Email- Two

Dear (Name),

Almost two weeks ago, you received an email requesting your participation in a study to confirm the importance of items that were generated in Round Two that relate to a new value added beef Extension program. As of today, we have not received your completed survey. Round Three has 12 questions and will only take you about 15 minutes to complete.

For any questions about this study, please feel free to contact Sarah Smith (sjalmaz@iastate.edu) or Dr. Greg Miller (gsmiller@iastate.edu).

To begin the final round, please click here: [Qualtrics Link]

Sincerely,

Sarah Smith
Agricultural Education Doctoral Student
Iowa State University

Dr. Greg Miller
Professor of Agricultural Education
Iowa State University

Appendix B. Value Added Beef Delphi Study

B-1. Round One

Q1 The purpose of this study is to help us have a better understanding on what should be included in a new value added beef Extension program for the Farm, Food and Enterprise Development Extension group. For the purpose of the study, please refer to the USDA's definition for Value Added which is:

- A change of physical state or form of the product (such as milling wheat into flour)
- Production of a product in a manner that enhances its value, as demonstrated through a business plan (such as organic products)
- Physical segregation of an agricultural commodity or product in a manner that results in the enhancement of the value of that commodity or product (such as identity preserved marketing system)

Name (First and Last)
Q2 Biological Gender
   ○ Male
   ○ Female

Q3 What is your professional position?
   ○ Faculty
   ○ Extension Specialist
   ○ Industry Education Provider
   ○ Beef producer

Q4 How many years have you been involved in the beef industry?

Q5
Below type what region of Iowa you are located in using the map above.

Q6 How often do you receive inquiries about value added beef production?

- Once a week
- Once a month
- Once a quarter
- Once every six months
- Once a year
- Never

Q10 For the first round, the purpose is to come up with a list of items that answer the following questions. Please type a list of as many items as you would like to answer the next two questions. All answers collected will only be seen by the researcher and answers shared will be anonymous.

Continue to use the USDA definition of value added, which is:
1. A change of physical state or form of the product (such as milling wheat into flour)
2. Production of a product in a manner that enhances its value, as demonstrated through a business plan (such as organic products)
3. Physical segregation of an agricultural commodity or product in a manner that results in the enhancement of the value of that commodity or product (such as identity preserved marketing system).

Q1) What challenges do beef producers face in regard to alternative production methods and marketing?

__________________________________________________________________________________________________________
__________________________________________________________________________________________________________
__________________________________________________________________________________________________________
__________________________________________________________________________________________________________
__________________________________________________________________________________________________________
__________________________________________________________________________________________________________
Q2) What competencies should be included in a value-added beef Extension program on alternative production methods and marketing?

________________________________________________________________
________________________________________________________________
________________________________________________________________
________________________________________________________________
________________________________________________________________
________________________________________________________________

B-2. Round Two

Q2 The purpose of this study is to help us better understand what should be included in a new value added agricultural beef Extension program for the Farm, Food and Enterprise Development Extension group. For round two, we would like you to evaluate the importance and rate your agreement with the items listed in the following survey. This survey has been organized in two parts and used the items collected from round one in categories based on commonality.

For the purpose of the study, please refer to the USDA’s definition for Value Added which is:
- A change of physical state or form of the product (such as milling wheat into flour)
- Production of a product in a manner that enhances its value, as demonstrated through a business plan (such as organic products)
- Physical segregation of an agricultural commodity or product in a manner that results in the enhancement of the value of that commodity or product (such as identity preserved marketing system)

Enter your Name (First and Last) in the below text box.

________________________________________________________________

Q1
PART ONE: Beef Producer Challenges

Please indicate the extent to which you agree that the following items are

Beef Industry Structure challenges that beef producers face with alternative production methods and marketing.
<table>
<thead>
<tr>
<th></th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The production side of the beef industry is independent and diverse in regards to sector affiliation (cow-calf vs backgrounder vs feedlot).</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>2. Sector differentiation may lead to challenges when providing information on production practice verification for value-added labeling.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>3. Volume produced due to diverse type and kind of cattle produced is variable.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>4. Challenge of having a consistent and steady supply of animals. (i.e. how do you maintain a short calving season but still meet the demand of year-round grass finished beef?)</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>5. Proper production methods such as grass finishing, timing production with the harvest date.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>

Q4 Please indicate the extent to which you agree that the following items are Monetary challenges that beef producers face with alternative production methods and marketing.

<table>
<thead>
<tr>
<th></th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Longer production cycles and higher start-up costs in value-added production that don't match with standard agricultural funding schedules.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>2. Input costs to establish a product by changing production and enhancing the value through differentiated marketing.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>3. Markets such as grass finished beef markets, don't return enough profit to producers to justify the longer production time required.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>4. Initial capital investment and other costs associated with a start-up for a new value-added venture are prohibitive for producers.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>5. There are greater costs associated with most alternative production methods. For example: less gain and feed efficiency due to not utilizing technologies such as implants.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>6. With direct marketing programs such as freezer beef, there's a greater labor and input costs along with logistical challenges.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>
7. Producers must do more with less and lower the cost of production.  

8. Overall cost of production for specialized programs and branding of their products.

9. Producers determining price based off their production costs vs. no knowledge of production costs.

Q5 Please indicate the extent to which you agree that the following items are Marketing challenges that beef producers face with alternative production methods and marketing.

1. Producers having a place to market their product and supplying the markets.

2. Producers having a viable market when dealing with the beef industry’s long production cycle.

3. Producers having a small segment of the market that will pay a premium to the producer that covers additional expenses for the value-added product.

4. Limited existing market outlets for producers.

5. Producers being able to find a consistent and profitable market that offers premiums for their product.

6. The difficulty level and time consumption relating to understanding marketing strategies and marketing effectively.

7. Determining appropriate size of an operation to have a sustainable market.

8. Developing a marketing strategy based on the number of head of cattle the operation has.

9. Producers having delivery skills for the product.

10. Producers being able to have consistent availability of their product.
11. Location of the markets can be a challenge. (i.e. Markets of value-added ag are in larger cities so producers must ship their products. Navigating how to ship perishable products out of town can be challenging).


13. Producers having advertising and business skills to produce retail.

14. Having variability of the product even under consistent management practices.

15. Producers expanding beyond direct markets.

16. Market accessibility for products that have a very limited shelf life that may have many food safety challenges.

17. Having the knowledge and understanding of different consumer trends and how that effects the producers overall market options.

18. Confidence in the chosen value-added marketing strategy that the producer selected as it may take extra time to see a return.

Q6 Please indicate the extent to which you agree that the following items are Consumer challenges that beef producers face with alternative production methods and marketing.

<table>
<thead>
<tr>
<th>Item</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Iowans as a whole don’t consume much grass fed/finished beef.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>2. Consumers are misinformed about the product.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>3. People assume things are comfortable to humans are the same for livestock.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>4. Understanding and matching the product to what the consumer would like. For example, not everyone wants a 16” ribeye.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>5. Having new ready to eat products for consumers.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>6. Quality and taste differences associated with grass finishing beef.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>
7. Consumer education on how their cattle are raised, priced, and prepared to cook different cuts of meat.

Q7 Please indicate the extent to which you agree that the following items are **Resource** challenges that beef producers face with alternative production methods and marketing.

<table>
<thead>
<tr>
<th>Resource Challenges</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Producers have limited feed resources such as pasture and hay along with overall land availability to producers.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>2. Producers' availability of small federally inspected lockers.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>3. Producers competing with CRP payments and pasture rent.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>

Q8 Please indicate the extent to which you agree that the following items are **Regulation and Labeling** challenges that beef producers face with alternative production methods and marketing.

<table>
<thead>
<tr>
<th>Regulation and Labeling Challenges</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Changes to the systems currently in place for production.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>2. Communication between state and federal inspectors.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>3. Traceability back to the farm.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>4. Limited accessibility to USDA inspectors limiting the ability to sell product out of state.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>5. Long process of labeling through the USDA.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>6. Other producers false labeling their products. For example producers putting labels on their product that haven’t been approved by the USDA.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>7. Proper knowledge of laws and regulations and how to pass them onto producers.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>8. Ensuring food safety and compliance with USDA rules related to direct marketing.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>
Q9 Please indicate the extent to which you agree that the following items are Other Protein Source challenges that beef producers face with alternative production methods and marketing.

<table>
<thead>
<tr>
<th></th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The demand for synthetic meats and alternative protein sources.</td>
<td></td>
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<tr>
<td>2. The competition from imported products.</td>
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<tr>
<td>3. Producers competing with other commodity products while distinguishing their product from others.</td>
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</tr>
</tbody>
</table>

Q11 Part Two: Potential Competenices for Value Added Beef Extension program

Please indicate the extent to which you agree that the following Foundations of Beef Production should be competencies included in a value added beef Extension program.

<table>
<thead>
<tr>
<th></th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Basic animal nutrition, health and husbandry practices.</td>
<td></td>
<td></td>
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<tr>
<td>2. Learn basic conventional beef production practices to understanding what and why things are done that way</td>
<td></td>
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<tr>
<td>3. Forage management strategies.</td>
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<td>4. Regulations of animal harvesting.</td>
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<tr>
<td>5. Regulations regarding transportation of livestock and meat products.</td>
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<tr>
<td>6. Diet formulation skills to match production goals.</td>
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</tbody>
</table>

Q12 Please indicate the extent to which you agree that the following Foundations of Value Added Production should be competencies included in a value added beef Extension program.
<table>
<thead>
<tr>
<th></th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Define the various value-added programs and describe the criteria to be qualified for the specific program.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>2. Describe the advantages and disadvantages of using alternative production methods and marketing strategies.</td>
<td></td>
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<td></td>
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<tr>
<td>3. Labeling regulations and requirements for shipping across state lines.</td>
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<tr>
<td>4. Details on shipping perishable value-added products to consumers.</td>
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<tr>
<td>5. Funding opportunities and deadlines to match the value-added beef production cycle.</td>
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<tr>
<td>6. Identify different government programs and how a producer could utilize them in their operation.</td>
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<tr>
<td>7. Specific production practices aligned with the marketing strategy.</td>
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</tbody>
</table>

Q13 Please indicate the extent to which you agree that the following **Tools for Producers** should be competencies included in a value added beef Extension program.

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<thead>
<tr>
<th></th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
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<tbody>
<tr>
<td>1. Decision tools for cattle performance, economic/ price outlook, etc.</td>
<td></td>
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<tr>
<td>2. Record keeping tools and software to assist in tracking production costs.</td>
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<tr>
<td>3. New technology to better time marketing of cattle such as carcass ultrasound.</td>
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<td>4. Science based research to learn about the details of different production methods.</td>
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<td>5. Stability of information and programming</td>
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</table>

Q14 Please indicate the extent to which you agree that the following **Business and Marketing** items should be competencies included in a value added beef Extension program.
<table>
<thead>
<tr>
<th></th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
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### B-3. Round Three

Q1 The purpose of this study is to help us better understand what should be included in a new value added agricultural beef Extension program for the Farm, Food and Enterprise Development Extension group. For round three, we would like you to evaluate the items that reached consensus in round two and confirm if you believe the items are important for a new
value added agricultural beef Extension program. This survey has been organized in two parts and used the items collected from round two in categories based on commonality.

For the purpose of the study, please refer to the USDA's definition for Value Added, which is:
- A change of physical state or form of the product (such as milling wheat into flour)
- Production of a product in a manner that enhances its value, as demonstrated through a business plan (such as organic products)
- Physical segregation of an agricultural commodity or product in a manner that results in the enhancement of the value of that commodity or product (such as identity preserved marketing system)

Enter your Name (First and Last) in the below text box.

________________________________________________________________

Q3 PART ONE: Beef Producer Challenges

Please indicate if you agree the following items are important Beef Industry Structure challenges that beef producers face with alternative production methods and marketing.

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
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<tbody>
<tr>
<td></td>
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<tr>
<td>1. Sector differentiation may lead to challenges when providing information on production practice verification for value-added labeling.</td>
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<tr>
<td>2. Volume produced due to diverse type and kind of cattle produced is variable.</td>
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</tbody>
</table>

Q4 Please indicate if you agree the following items are important Monetary challenges that beef producers face with alternative production methods and marketing.

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
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<tbody>
<tr>
<td></td>
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<tr>
<td>1. Input costs to establish a product by changing production and enhancing the value through differentiated marketing.</td>
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<tr>
<td>2. There are greater costs associated with most alternative production methods. For example: less gain and feed efficiency due to not utilizing technologies such as implants.</td>
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<tr>
<td>3. With direct marketing programs such as freezer beef, there are greater labor and input costs along with logistical challenges.</td>
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<tr>
<td>4. Overall cost of production for specialized programs and branding of their products.</td>
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<tr>
<td>5. Producers determining price based off their production costs vs. no knowledge of production costs.</td>
<td></td>
</tr>
</tbody>
</table>
Q5 Please indicate if you agree the following items are important Marketing challenges that beef producers face with alternative production methods and marketing.

<table>
<thead>
<tr>
<th>Item</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Producers having a place to market their product and supplying the markets.</td>
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<tr>
<td>2. Producers having a viable market when dealing with the beef industry’s long production cycle.</td>
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<tr>
<td>3. Producers having a small segment of the market that will pay a premium to the producer that covers additional expenses for value-added product.</td>
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<tr>
<td>4. Limited existing market outlets for producers.</td>
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<tr>
<td>5. Producers being able to find a consistent and profitable market that offers premiums for their product.</td>
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<tr>
<td>6. Producers being able to have consistent availability of their product.</td>
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<tr>
<td>7. Location of the markets can be a challenge. (i.e. Markets of value-added ag are in larger cities so producers must ship their products. Navigating how to ship perishable products out of town can be challenging).</td>
<td></td>
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<tr>
<td>9. Having variability of the product even under consistent management practices.</td>
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<tr>
<td>10. Producers expanding beyond direct markets.</td>
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<tr>
<td>11. Market accessibility for products that have a very limited shelf life that may have many food safety challenges.</td>
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<tr>
<td>12. Confidence in the chosen value-added marketing strategy that the producer selected as it may take extra time to see a return.</td>
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</tbody>
</table>
**Q6** Please indicate if you agree the following items are important **Consumer** challenges that beef producers face with alternative production methods and marketing.

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
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<tbody>
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</tbody>
</table>

1. Understanding and matching the product to what the consumer would like. For example, not everyone wants a 16” ribeye.

2. Quality and taste differences associated with grass finishing beef.

3. Consumer education on how their cattle are raised, priced and prepared to cook different cuts of meat.

---

**Q7** Please indicate if you agree the following items are important **Resource** challenges that beef producers face with alternative production methods and marketing.

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
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<tbody>
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</tbody>
</table>

1. Producers’ availability of small federally inspected lockers.

2. Producers competing with CRP payments and pasture rent.

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**Q8** Please indicate if you agree the following items are important **Regulation and Labeling** challenges that beef producers face with alternative production methods and marketing.

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
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<tbody>
<tr>
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</tbody>
</table>

1. Limited accessibility to USDA inspectors limiting the ability to sell product out of state.

2. Long process of labeling through the USDA.

3. Proper knowledge on laws and regulations and how to pass them onto producers.

4. Ensuring food safety and compliance with USDA rules related to direct marketing.
Q9 Please indicate if you agree the following items are important **Other Protein Source** challenges that beef producers face with alternative production methods and marketing.

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Producers competing with other commodity products while distinguishing their own products from others.</td>
<td></td>
</tr>
</tbody>
</table>

Q10

**Part Two: Potential Competencies for Value Added Beef Extension program**

Please indicate if you agree that the following **Foundations of Beef Production** items are important competencies that should included in a value added beef Extension program.

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Basic animal nutrition, health and husbandry practices.</td>
<td></td>
</tr>
<tr>
<td>2. Forage management strategies.</td>
<td></td>
</tr>
<tr>
<td>3. Regulations of animal harvesting.</td>
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</tr>
<tr>
<td>4. Regulations regarding transportation of livestock and meat products.</td>
<td></td>
</tr>
<tr>
<td>5. Diet formation skills to match the production goals.</td>
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</tbody>
</table>

Q11 Please indicate if you agree that the following **Foundations of Value-Added Production** items are important competencies that should be included in a value added beef Extension program.

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
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</thead>
<tbody>
<tr>
<td>1. Define the various value-added programs and describe the criteria to be qualified for the specific program.</td>
<td></td>
</tr>
<tr>
<td>2. Describe the advantages and disadvantages of using alternative production methods and marketing strategies.</td>
<td></td>
</tr>
<tr>
<td>3. Labeling regulations and requirements for shipping across state lines.</td>
<td></td>
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<tr>
<td>4. Details on shipping perishable value-added products to consumers.</td>
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</tbody>
</table>
Q12 Please indicate if you agree that the following **Tools for Producers** are important competencies that should be included in a value added beef Extension program.

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
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<tbody>
<tr>
<td>☐</td>
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</tbody>
</table>
|     | 1. Decision tools for cattle performance, economic/ price outlook, etc.  
| ☐   | ☐  |
| ☐   | ☐  |
|     | 2. Record keeping tools and software to assist in tracking production costs.  
| ☐   | ☐  |
| ☐   | ☐  |
|     | 3. Science based research to learn about the details of different production methods.  
| ☐   | ☐  |

Q13 Please indicate if you agree that the following **Business and Marketing items** are important competencies that should be included in a value added beef Extension program.

<table>
<thead>
<tr>
<th>Yes</th>
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| ☐   | ☐  |
Appendix C. Institutional Review Board Approval

IOWA STATE UNIVERSITY
OF SCIENCE AND TECHNOLOGY

Institutional Review Board
Office for Responsible Research
Vice President for Research
2420 Lincoln Way, Suite 202
Ames, Iowa 50014
515-294-4566

Date: 09/25/2019
To: Sarah Smith
From: Office for Responsible Research
Title: Identifying competencies for a value added beef extension curriculum
IRB ID: 19-452
Submission Type: Initial Submission
Exemption Date: 09/25/2019

The project referenced above has been declared exempt from most requirements of the human subject protections regulations as described in 45 CFR 46.104 or 21 CFR 56.104 because it meets the following federal requirements for exemption:

2018 - 2 (i): Research that only includes interactions involving educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures, or observation of public behavior (including visual or auditory recording) when the information obtained is recorded by the investigator in such a manner that the identity of the human subjects cannot readily be ascertained, directly or through identifiers linked to the subjects.

The determination of exemption means that:

- You do not need to submit an application for continuing review. Instead, you will receive a request for a brief status update every three years. The status update is intended to verify that the study is still ongoing.

- You must carry out the research as described in the IRB application. Review by IRB staff is required prior to implementing modifications that may change the exempt status of the research. In general, review is required for any modifications to the research procedures (e.g., method of data collection, nature or scope of information to be collected, nature or duration of behavioral interventions, use of deception, etc.), any change in privacy or confidentiality protections, modifications that result in the inclusion of participants from vulnerable populations, removing plans for informing participants about the study, any change that may increase the risk or discomfort to participants, and/or any change such that the revised procedures do not fall into one or more of the regulatory exemption categories. The purpose of review is to determine if the project still meets the federal criteria for exemption.

- All changes to key personnel must receive prior approval.

- Promptly inform the IRB of any addition of or change in federal funding for this study. Approval of the protocol referenced above applies only to funding sources that are specifically identified in the corresponding IRB application.

IRB 01/2019
CHAPTER 4. VALUE-ADDED BEEF EXTENSION PROGRAM FOR SMALL FARMERS

Sarah Al-Mazroa Smith¹, Greg Miller²

¹Iowa State University, Department of Agricultural Education

Modified from a manuscript to be submitted to in Journal of Extension (Ideas at Work category).

Abstract

As beef industry trends have been evolving, beef producers are looking for value-added beef practices and marketing strategies. A new value-added beef Extension program foundation was created at Iowa State University based on input from beef industry and education experts. In addition to the curriculum framework, we developed a needs assessment tool focused on program objectives and delivery method preferences. This tool can be used to adapt the program to meet specific needs and preferences of participants.

Introduction and Background

The state of Iowa has 86,000 farm operations, 28,000 of these include cattle (Iowa Beef Center, 2017). As markets have evolved, beef producers have been looking into new opportunities to increase their overall profitability. One way to increase profitability is through value added programs. According to the USDA, Value Added can be defined as a change in the physical state or form of the product, production of a product in a manner that enhances its value, or physical segregation of an agricultural commodity or product that results in value enhancement (AGMRC, 2020).

As producers have been looking into value added opportunities there has been a demand for additional value-added programming through Extension and outreach. One of the main
purposes of Extension is to provide science in a practical application format through educational programming (USDA National Institute of Food and Agriculture, n.d.). To provide these programming opportunities, it is essential to hear from participants in the program to determine whether the program will align with their needs. Programs need to align with the content needs of the audience as well as their delivery method preferences (Bardon et al., 2007).

The mission of Iowa State University Extension is to “…build a strong Iowa by engaging all Iowans in research, education and Extension experiences to address current and emerging real-life challenges” (ISU Extension, 2020). Understanding that beef producers are looking for ways to increase profitability, it is essential to ascertain whether the competencies of a new value-added beef Extension program align with the demands of current beef producers in the state of Iowa. Serving Iowans with the newest and most aligned program allows for a positive progression in the state.

**Theoretical Framework**

The new knowledge that Extension provides through educational programming can be described as an innovation (Rogers, 2003). A new value-added Extension program was the innovation for this study. When creating the innovation the most important items to consider are whether the innovation is compatible with one’s audience as well as the appropriate complexity based on the participants’ level of knowledge and awareness of the topic (Rogers, 2003).

The theoretical framework for this study was based on Diffusion of Innovation Theory. The first element of the theory is the creation of the Innovation or the “…idea, practice or object that has been perceived as new by an individual” (Rogers, 2003, p. 12). For the purpose of this study, the innovation is the creation of a new value-added beef Extension educational program. Compatibility is known to be the attribute that is most important for the participants to adopt the innovation that is being provided (Harder & Lindner, 2008). As defined by Rogers (2003)
compatibility is the “…degree to which the innovation is perceived as being consistent with the values and needs of the adopters” (p. 12). If individuals do not perceive the innovation aligns with their needs, the rate of adoption of the innovation decreases (Rogers, 2003).

Rogers (2003) defined complexity as the perception that the innovation is difficult to understand and use. To maximize the impact of the educational program, it is essential to ensure that competencies are at an appropriate complexity stage for the participants. Individuals are more likely to adopt an innovation when they see its relevance to their life and that it would not be hard to apply in their daily routine (Moore et al., 2012). For example, if Extension® is delivered to Extension personnel that is compatible with their work but their technology skill level is not high, the complexity will decrease the rate of adoption at the beginning (Harder & Lindner, 2008).

Compatibility and complexity of the innovation not only deal with the content of the innovation but also the effectiveness of the communication channel. According to Rogers (2003), communication channels refer to the process through which information is shared with one another to reach a mutual understanding. The channel is the method in which the information is being shared. Channels include mass media channels and interpersonal channels. Mass media channels reach large audiences rapidly but have a weak attitude change. Interpersonal channels reach smaller groups of people face-to-face and result in higher change of attitude (Rogers, 2003). Rogers (2003) noted that interpersonal channels provide the best opportunity to exchange information, overcome perceptions, and persuade an individual to change their attitude about adopting an innovation.

Using an inappropriate delivery method can have negative consequences on the program’s effectiveness (Bardon et al., 2007). Extension programming has evolved from in-
person workshops to online or web-blended workshops due to decreased budgets (Rader & Gannon, 2015). One of the challenges when it comes to changing the delivery method of Extension programming is the change in culture amongst Extension personnel (Dromgoole & Boleman, 2006). Findings of a Delphi study conducted by Dromgoole and Boleman (2006) revealed that Extension personnel identified an obstacle for the participants towards feeling connected with the instructor; thus some competencies may fall short due to the nature of distance education. Extension personnel perceived some participants might experience technological challenges that may lead them to fail to accept distance education methods. However, the personnel did see an advantage in contacting a greater number of individuals, and they recommended that it was important to align the delivery method with the targeted audience (Dromgoole & Boleman, 2006).

**Purpose Statement**

Al-Mazroa Smith and Miller (n.d.) provided a foundational structure for a new value-added beef Extension program for beef producers in Iowa. This paper describes a needs assessment instrument and the process of utilizing the instrument to assess program compatibility, program complexity, and delivery method preferences of beef producers who plan to participate in the value-added program. The creation of the instrument and structure for a value-added beef Extension program was done in the Fall of 2020.

**Program Planning**

**Overview**

This program was created for beef producers who are currently utilizing value-added practices or seeking knowledge about value-added beef production and marketing. To maximize interaction between participants and the educator, consider limiting the class size to 30 people or less.
Goal

The goal of the Value-added Beef Extension program is to increase knowledge and awareness of value-added production and marketing. This program will enable producers to change their current production and/or marketing techniques to increase the overall profitability of their operation.

Outcomes

This program has expected short-, medium- and long-term outcomes. Table 4.1 details the program outcomes.

<table>
<thead>
<tr>
<th>Table 4.1. Details for Program Outcomes.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Short Term Outcomes</strong></td>
</tr>
<tr>
<td>• Increase producer awareness of value-added beef production.</td>
</tr>
<tr>
<td>• Increase producer knowledge of the technical aspects of value-added beef production and marketing.</td>
</tr>
<tr>
<td><strong>Medium Term Outcomes</strong></td>
</tr>
<tr>
<td>• Impact participants’ decision-making on production and marketing.</td>
</tr>
<tr>
<td><strong>Long Term Outcomes</strong></td>
</tr>
<tr>
<td>• Impact economic outcomes for participants and their community.</td>
</tr>
</tbody>
</table>

Course Delivery

We recommend delivering the Value-Added Beef program in a hybrid format with online asynchronous learning modules and in-person workshops. This is due to adult learners liking a mixed method approach to program delivery (Dollisso & Martin, 1999). The online portion should provide participants with technical information through recorded lectures, readings, etc. Once participants complete the online portion, an in-person workshop would allow for application of the information by introducing examples of scenarios and the participants’ own operation’s work.

Course Content

The course content is comprised of a series of four modules. Table 4.2 provides a summary of the course content presented in each module.
Table 4.2. Summary of Course Content for the Value-added Beef Extension Program.

<table>
<thead>
<tr>
<th>Module One- Foundations of Value-Added Production</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Module Two - Foundations of Beef Production</th>
</tr>
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<tbody>
<tr>
<td>Description</td>
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</table>

<table>
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<tr>
<th>Module Three - Business and Marketing</th>
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<tr>
<td>Description</td>
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<table>
<thead>
<tr>
<th>Module Four - Tools</th>
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<tr>
<td>Description</td>
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</table>

**Needs Assessment**

It is critical to perform a needs assessment to ensure that the program can be tailored to the specific group of producers who participate. The following subsections provide a description of the needs assessment and evaluation plan for the value-added beef Extension program. The evaluation focuses on the short-term outcomes and the alignment of the program with the needs of beef producers in the state of Iowa.
Methods and Procedures for Program Assessment

Participants

The needs assessment should include all beef producers who plan on participating in the Extension program.

Instrument

The needs assessment questionnaire was organized into three sections that included demographics, value-added beef Extension program objectives, and delivery methods. Program participants were asked to indicate whether the objectives listed are compatible to their operation’s needs. Then they were asked to rate whether the same objectives are at the appropriate complexity. Finally, participants rated their preference of different delivery methods for the Extension program. A copy of the Needs Assessment Survey Instrument is provided in Figure 4.1.

Do you manage, own or work with beef cattle regularly?

- Yes
- No

In the past 12 months, have you participated in any Extension and Outreach program? (i.e. Workshops, Webinars, Online Resources, etc.)

- Yes
- No

When creating a new Extension and Outreach program there are many different objectives Extension specialists could cover. However, we want to ensure educational objectives align with information that is relevant to you. We also want our educational programs to help advance your operation's goals. Please indicate the extent to which you agree that the following objectives align with your information needs on this page.

Figure 4.1. Value-Added Beef Producer Survey Instrument to Measure Compatibility, Complexity of Objectives and Preferred Delivery Methods.
(Rating Scale: Strongly disagree, Disagree, Neither agree nor disagree, Agree, Strongly Agree)

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>1.</td>
<td>Apply different business planning strategies to manage cost of the operation.</td>
</tr>
<tr>
<td>2.</td>
<td>Recognize the details of a generic business plan for beef operations.</td>
</tr>
<tr>
<td>3.</td>
<td>Produce an example business plan for a beef operation.</td>
</tr>
<tr>
<td>4.</td>
<td>Outline different business plans with specific timeframes.</td>
</tr>
<tr>
<td>5.</td>
<td>Analyze different investment requirements for your new or expanding business.</td>
</tr>
<tr>
<td>6.</td>
<td>Summarize break-even details.</td>
</tr>
<tr>
<td>7.</td>
<td>Identify beef marketing strategies.</td>
</tr>
<tr>
<td>8.</td>
<td>Practice beef operation’s budgeting.</td>
</tr>
<tr>
<td>9.</td>
<td>Critique a break-even budget.</td>
</tr>
<tr>
<td>10.</td>
<td>Explain the labeling regulation details of meat products.</td>
</tr>
<tr>
<td>11.</td>
<td>Summarize the requirements for shipping product across state lines.</td>
</tr>
<tr>
<td>12.</td>
<td>Describe the details on shipping perishable value-added products to consumers.</td>
</tr>
<tr>
<td>13.</td>
<td>Summarize the basics of forage management strategies.</td>
</tr>
<tr>
<td>15.</td>
<td>Apply different forage management strategy plans to your own operation.</td>
</tr>
<tr>
<td>16.</td>
<td>Describe regulations regarding transportation (movement) of livestock.</td>
</tr>
<tr>
<td>17.</td>
<td>Identify record keeping tools that are available to assist in tracking production costs.</td>
</tr>
<tr>
<td>18.</td>
<td>Demonstrate the use of record keeping tools for tracking production costs with example records.</td>
</tr>
<tr>
<td>19.</td>
<td>Recall the basic details of decision tools for cattle performance, economic/ price outlook, etc.</td>
</tr>
<tr>
<td>20.</td>
<td>Analyze cattle performance through using decision tools.</td>
</tr>
<tr>
<td>21.</td>
<td>Interpret economic/ price outlook through using decision tools.</td>
</tr>
</tbody>
</table>

For the next set of questions, we want to ensure the educational objectives are at the appropriate complexity level to ensure the content is useful. We don't want items to be too simple or too complex.

Please rate the following objectives based on how you feel the **complexity** level is for the listed objectives.

Figure 4.1 (Continued).
(Rating Scale: Too easy, Just right, Too complex)

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<table>
<thead>
<tr>
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<tbody>
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</tr>
</tbody>
</table>

There are many different delivery methods that can be used when implementing an Extension and Outreach program. You may have experienced a variety of delivery methods during your involvement with ISU Extension and Outreach. Please rate the following delivery methods based on your personal preference.

Figure 4.1(Continued).
(Rating scale: Strongly dislike, Dislike, Like, Strongly Like)

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>1.</td>
<td>Formal Lecture Style Class (In person)</td>
</tr>
<tr>
<td>2.</td>
<td>Hands on Workshop (In person)</td>
</tr>
<tr>
<td>3.</td>
<td>Field Day (Single day in person during business hours)</td>
</tr>
<tr>
<td>4.</td>
<td>Short Course (Multiple days in person)</td>
</tr>
<tr>
<td>5.</td>
<td>Evening Meetings (In person outside of normal business hours)</td>
</tr>
<tr>
<td>6.</td>
<td>Fellow Producer Mentor Program (In person)</td>
</tr>
<tr>
<td>7.</td>
<td>Small Group Work (In person)</td>
</tr>
<tr>
<td>8.</td>
<td>Mailed Publications/ Information</td>
</tr>
<tr>
<td>9.</td>
<td>Publications (Online)</td>
</tr>
<tr>
<td>10.</td>
<td>Email Newsletter (Online)</td>
</tr>
<tr>
<td>11.</td>
<td>Recorded Informational Videos (Online)</td>
</tr>
<tr>
<td>12.</td>
<td>Webinars Guided by Extension Personnel (Online)</td>
</tr>
<tr>
<td>13.</td>
<td>Self-guided Webinars (Online)</td>
</tr>
<tr>
<td>14.</td>
<td>Podcast (Audio/ Online)</td>
</tr>
<tr>
<td>15.</td>
<td>Web-blended Workshops (Online and In person)</td>
</tr>
</tbody>
</table>

Approximately, how often do you participate in a university Extension and Outreach program?

- [ ] Once a year
- [ ] Once every six months
- [ ] Once every three months
- [ ] Once a month
- [ ] Once a week

What is your gender identity?

- [ ] Male
- [ ] Female
- [ ] Other
- [ ] Prefer not to answer

Please enter your age in years. (enter a number)

Figure 4.1 (Continued).
What sector of the beef industry are you involved in? (check all that apply)

☐ Commercial cow-calf

☐ Seedstock

☐ Feedlot

☐ Cow-calf through Feedlot (Retained Ownership)

☐ Other (please describe in the text box below)

__________________________________________________________________________________

Approximately how many head of cattle do you own?

__________________________________________________________________________________

Approximately how many head of cattle do you manage for someone else?

__________________________________________________________________________________

Approximately how many years have you been involved in beef production?

__________________________________________________________________________________

Figure 4.1 (Continued).

The instrument was deemed valid and reliable for the intended purpose of assessing the needs of beef producers who plan to participate in the program. To ensure content and face validity a panel of experts evaluated the questionnaire using an evaluation rubric (Appendix B). The panel was comprised of two beef experts, two Extension personnel, and one evaluation expert. A field test of the questionnaire was completed with five producers. Finally, a pilot study was conducted to evaluate the questionnaire for reliability. The test-retest reliability coefficient was 0.88. Research methods received human subjects’ approval (IRB # 20-348, Appendix B).
**Program Evaluation Data Collection**

The survey can be administered online through Qualtrics or via paper. The questionnaire should be accompanied by an explanation that the purpose of the survey is to enable program planners to learn more about the producers’ wants and needs so that the program can be modified accordingly. All communication to participants should be personalized. If multiple communications are used, the content and tone should vary. It is advisable to send messages at the beginning of the workday and send them frequently, i.e., fewer than 3 days apart (Dillman, Symth & Christian, 2009).

**Data Analysis**

The data from the needs assessment can be analyzed with Qualtrics, Excel, SPSS, or any other similar data processing software. Descriptive statistical analysis is recommended.

Data collected from the questionnaire enables program planners to see the alignment of the program’s objectives and delivery methods. The first set of questions asks participants if objectives are compatible. Results from the first set of question will reveal if the objectives of the program align with the existing values and needs of the producers. When a mean score for an objective is between 1–2.5 it signifies the objective is not compatible with the needs for the producers and it is recommended that the objective is dropped or changed to align with the needs.

The second set of questions ask producers about the complexity. Results from these questions will reveal if the difficulty level of the objectives are too easy or just right. From these results, one may change the difficulty level to challenge producers who participate in the program. If the mean score is between 1–1.5 the objective is too easy, and it is recommended to increase the difficulty level of the objective and the information that is taught. If the mean score is 2.51–3, the item is too complex and the objective needs to be simplified. An objective mean
between 1.51–2.5 indicates that the item difficulty is appropriate and should be used in the program.

The last set of questions inquire about the delivery methods of the Extension program. The results from these questions will reveal what delivery method the participants prefer. If a mean score falls between 1–2.5 that type of delivery method should not be used for the group of participants. If the mean score for the delivery method falls between 2.51–4, that type of delivery method should be implemented as the participants like/ strongly like that specific method.

**Conclusions**

Alignment between producers and the educational materials in an Extension program is critical to ensure that producers’ needs are met. The curriculum and instrument created in this article can be adapted and changed based on the setting and the needs for the audience that will participate in the program. Because this program is new, it is critical to get to know the program participants. This will allow for continuous improvements in the program’s objectives and delivery methods. When the curriculum is adapted based on beef producers’ input the curriculum will achieve its maximum level of effectiveness.

**References**


**Appendix A. Validity Rubric**

The objectives of this study:

1. Describe the level of compatibility of the program topics to beef producers.

2. Describe the level complexity of the program topics to beef producers.

3. Describe the personal preference of different extension delivery methods for beef producers.
As you are reviewing the questionnaire, please consider whether each item of the questionnaire is:

1. Relevant to the objectives
2. Clear and Concise
3. Not double-barreled
4. Free of technical jargon

Please examine each item of the questionnaire. Indicate on the questionnaire if the item should be:

1. Retained as is (Requires no mark)
2. Modified and retained (Make edits/comments on the questionnaire itself)
3. Deleted (Mark through the item on the questionnaire)

Please review the questionnaire and evaluate it for **Content Validity**. The questionnaire is content valid if you believe that the items included in each section are a fair representation of what should be included in that section. After reviewing the questionnaire, please check the following.

__________ The questionnaire is content valid.

__________ The questionnaire will be content valid after making the changes I have recommended.

__________ The questionnaire is not content valid for the following reasons:

______________________________________________________________________

Please review the questionnaire and evaluate it for **Face Validity**. The questionnaire is face valid if a typical respondent would agree that the items included on the questionnaire are consistent with the stated purpose of the study. After reviewing the questionnaire, please check the following.

__________ The questionnaire is face valid.

__________ The questionnaire will be face valid after making the changes I have recommended.

__________ The questionnaire is not face valid for the following reasons:

______________________________________________________________________
Appendix B. Institutional Review Board Approval

Iowa State University
OF SCIENCE AND TECHNOLOGY

Institutional Review Board
Office for Responsible Research
Vice President for Research
2420 Lincoln Way, Suite 202
Ames, Iowa 50014
515 294-4566

Date: 07/02/2020

To: Sarah Smith

From: Office for Responsible Research

Title: Consumer Perceptions Surrounding Beef Marketing and Production

IRB ID: 20-188

Submission Type: Initial Submission

Exemption Date: 07/02/2020

The project referenced above has been declared exempt from most requirements of the human subject protections regulations as described in 45 CFR 46.104 or 21 CFR 56.104 because it meets the following federal requirements for exemption:

2018 - 2 (i): Research that only includes interactions involving educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures, or observation of public behavior (including visual or auditory recording) when the information obtained is recorded by the investigator in such a manner that the identity of the human subjects cannot readily be ascertained, directly or through identifiers linked to the subjects.

The determination of exemption means that:

- **You do not need to submit an application for continuing review.** Instead, you will receive a request for a brief status update every three years. The status update is intended to verify that the study is still ongoing.

- **You must carry out the research as described in the IRB application.** Review by IRB staff is required prior to implementing modifications that may change the exempt status of the research. In general, review is required for any modifications to the research procedures (e.g., method of data collection, nature or scope of information to be collected, nature or duration of behavioral interventions, use of deception, etc.), any change in privacy or confidentiality protections, modifications that result in the inclusion of participants from vulnerable populations, removing plans for informing participants about the study, any change that may increase the risk or discomfort to participants, and/or any change such that the revised procedures do not fall into one or more of the regulatory exemption categories. The purpose of review is to determine if the project still meets the federal criteria for exemption.

- All **changes to key personnel** must receive prior approval.

- **Promptly inform the IRB of any addition or change in federal funding for this study.** Approval of the protocol referenced above applies only to funding sources that are specifically identified in the corresponding IRB application.

IRB 10/2019
CHAPTER 5. CONSUMER PERCEPTIONS AND HABITS SURROUNDING BEEF MARKETING AND PRODUCTION

Sarah Al-Mazroa Smith¹, Greg Miller¹, and Shuyang Qu¹

¹Iowa State University, Department of Agricultural Education

Modified from a manuscript to be submitted to in Journal of Applied Communication Research.

Abstract

Consumer perceptions impact many different items when it comes to buying beef. The purpose of this study was to describe and explore the consumer perception and buying actions for Iowa beef consumers. A Qualtrics survey was administered to collect data from 1098 Iowa consumers. This study identified: (1) where consumers buy their beef and why they do/don’t buy from certain locations; (2) where consumer get their information; (3) if there’s a relationship between where they get their information and buying location; (4) priorities of marketing topics; (5) consumer willingness to pay based on different brands; and (6) preference for protein consumption. The findings of this study revealed that Iowans like to purchase beef in person at a traditional grocery store because of cost, convenience, and accessibility. Iowans are also buying poultry and beef products more frequently compared to other proteins. They get their information from websites and trusted peers. However, there is a weak association between where they get their information and where they buy their beef. Iowa consumers describe that they see importance in different attributes and find satisfaction in the performance about the attributes however, organic is not as important to consumers suggesting the focus on marketing be decreased. Lastly, Iowa consumers are willing to pay more per pound for different marketing brands. Results of this study can be used by beef producers and Extension personnel to
understand the characteristics of Iowa consumers to enable producers and personnel to apply this information to different marketing and educational programming.

**Introduction and Background**

Beef consumers have been asking more questions about their food. These questions create opportunity for different value-added programs (Iowa Beef Center, 2019). For example, there has been an interest in health records in beef production operations. A survey done by the Iowa Beef Center in 2014 concluded that one third of the beef producers were participating in the certified health program (Iowa Beef Center, 2019). This trend of more certified programs will allow for producers to have more value-added opportunities. When exploring the value added opportunities, producers have the opportunity to change their production method or marketing strategy to increase profitability (Williams et al., 2013).

Within the beef industry, there has been an overall increase since 2015 of beef disappearance (i.e., the amount of beef used in domestic markets) (Jones et al., 2018). Although beef disappearance has increased, producers face challenges that can impact growth due to a variety of economic impacts such as rising input cost (Schulz, 2013). Producers watch for consumer signals to identify the demand for production methods and strive that their production practices align with consumer demand.

General knowledge of the beef movement is known; however, there is a lack of knowledge about the details about consumers. Consumer trends impact the amount of production, processing and the variety of product offerings (Mintert et al., 2009). Beef industry consumer demand is inelastic meaning that the beef demand is consistent regardless of price (Mintert et al., 2009). Due to this factor, it is recommended to look at what attributes truly impact the beef demand besides price. There are many different attributes that impact the demand of beef (Mintert et al., 2009).
With new knowledge of Iowa beef consumers, specialists will be equipped to include consumer perceptions in a new Extension program to align with consumer trends in Iowa. It is essential to understand the beef consumer perceptions, purchasing habits and overall nature of beef consumers in the state of Iowa due to the relationship between demand and beef production.

**Theoretical Framework and Conceptual Framework**

**Diffusion of Innovation Theory**

Innovations are diffused within the social system (Harder & Lindner, 2008). Social systems are a group of individuals who are bounded together to achieve a common goal (Rogers, 2003). The overall pattern of individuals who are in the system can impact the communication systems and impact the diffusion of any innovation (Rogers, 2003). Warner and Hobbs (2020) determined that making impact within individuals on any change of action the best strategy is through working with their closest peers. Understanding the personalized details of individuals within the social system allows people such as Extension personnel to effectively diffuse innovations.

The purpose of this study was to explore and describe Iowa beef consumer habits and perceptions within the beef industry. Consumers form the social system that surrounds beef producers. Understanding consumer behavior will enable Extension specialists to focus programs on the attributes that are deemed most important to consumers.

The theoretical framework for this study was based on Diffusion of Innovation Theory more specifically the Social System component. Diffusion of Innovation Theory is the process of innovations being communicated through different channels within a social system. The social system is important to understand people’s behaviors as it may impact individuals’ attitudes towards a particular item (Rogers, 2003). The social system is the network that surrounds the participants of an educational program (Hubbard & Sandmann, 2007). As a past study has
revealed, individuals in social systems have been known to gain knowledge and seek new information through different forms of communication such as traditional media and personal communication sources such as their peers (Kim et al., 2020). Consumers in the social system work together towards a common goal of buying and consuming beef.

The process of the innovation being adopted is within the social system. The innovation for this specific study is a new value-added beef Extension program. The biggest group of individuals that impact the attitude toward the innovation are beef consumers. Relationships between social systems and the diffusion process do impact the rate of adoption (Rogers, 2003). Understanding the principles that are within the social system will help improve the overall creation, delivery and impact of an Extension program (Scott et al., 2018).

In a previous study by Williams et al. (2013), consideration of the demographics of adopters (i.e., beef producers) was deemed important. This enabled Extension programs to be created around the audience that would accept the innovation. It is also important to look at the end market (i.e., consumers) of beef producers. Findings of study by Fiore et al. (2007) revealed that consumers like to be involved in the design of the shopping experience. Consumers are not just wanting to buy a product, they are also wanting to be included when thinking about the overall shopping experience (Fiore et al., 2007). Another study by Upah (2016) described the consumers buying meat at conventional grocery stores. Through exploring the consumer social system, Extension specialists are able to understand consumer habits and perceptions which allows for the specialists to include consumers in the marketing process. Another aspect of the social system is the communication system. Warner et al. (2019) study identified that Extension personnel should incorporate interpersonal communication with their clientele during education programs. Extension personnel can also bridge the communication gap between consumers and
producers. Qu et al. (2019) study identified the lack of communication between school systems and producers. This study recommended that an increase of education for both producers and the school system consumers would be desired to assist in bridging the gap between the two groups of individuals.

**Importance-Performance Analysis**

Analyzing consumer satisfaction and perceptions of product attributes can help producers evaluate their overall marketing plan. The Importance-Performance Analysis allows the researcher to prioritize the different items based on resources and which item needs to be addressed first when thinking about marketing (Warner et al., 2016).

The Importance-Performance Analysis allows the producers to ask consumers “How important is the feature?” and “How did the producer perform” (Martilla & James, 1977). The Importance-Performance Analysis is divided into four categories plotted on a graph. The four quadrants include: Concentrate Here, Keep up with the good work, Low Priority, and Possible Overkill. If an attribute falls into the Concentrate Here quadrant, it means that the attribute is important to consumers; however, the attribute has a low satisfaction rating by consumers. When an attribute is valued high in importance and the consumers are satisfied with the producer’s performance, it will fall into the Keep up with the Good Work quadrant. The Low Priority quadrant would include the attributes that are rated low in importance and satisfaction. Lastly, the Possible Overkill quadrant includes attributes that consumers are satisfied with but that are only slightly important to them (Martilla & James, 1977). Combining importance and performance scores allows the researcher to create a marketing strategy (Oh, 2001).

By using the Importance-Performance Analysis, we are able to determine what are the needs from a marketing standpoint that are not living up to the standards of marketing from the perceptions of the consumers. Using this analysis allows feedback from consumers about: (1)
Which traits are important; (2) How important is each trait; and (3) How well did the agency perform on each feature (Guadagnolo, 1985). From the data collected in this model, we can see what is lacking from the perception of the consumers and then include them into an Extension program for beef producers. This analysis allows for Extension personnel to organize items and guide developments through communication and programming over certain marketing characteristics (Warner et al., 2016).

In previous studies, other researchers utilized IPA to assist in answering the core questions that IPA can help with. A study done by Qu et al. (2017) concluded that consumers that evaluated the blueberry attributes were at least slightly important to them and they were at least slightly satisfied by the marketing strategies implemented. Data from the study also revealed that freshness and taste received the highest scores for importance and satisfaction from the group of participants (Qu et al. 2017). Similar to Qu et al. (2017), Lee et al., (2017) utilized IPA with green tea quality attributes. This study utilized the IPA in different countries (China, Japan, and Korea) to see if the attributes evaluations were different. The findings revealed there were differences based on the country’s tea drinkers, and identified the biggest attribute difference being the attribute of safety (Lee et al., 2017).

For this study, the fourteen attributes were analyzed utilizing the IPA. The selection of the attributes were based on attributes that could impact consumers’ buying habits. The price of a beef products influence consumer trends for buying in addition to other non-price demand characteristics (Hart & Schulz, 2019). Gvili et al. (2017) study confirmed that there is a direct impact on the perception of freshness on the specific taste. Taste is one of the highest impacts on non-price demands for beef products that can increase the profits in the beef industry (Hart & Schulz, 2019).
Other attributes studied included characteristics of value-added production such as identified through characteristics of value-added production such as organic, natural, the application of genetics to increase meat qualities (i.e., tenderness, marbling, etc.), grass fed, locally grown, or Grown in USA (AGMRC, 2020). Value-added production and marketing provides producers with different avenues to produce and market their product. Identifying the consumer perception on importance and satisfaction of performance for the alternative production and marketing practices allows producers to prioritize the different marketing strategies (Martilla & James, 1977). Jaenicke and Carlson (2015) found that the demand for organic products are increasing across a variety of food products. In addition how and where beef is coming from can impact the consumer habits. Past studies and reports have shown that location of where cattle are raised (local geographical area and same country), what they are fed, and how they were raised (natural, organic, etc.) all impact desirable attributes for consumer buying (Hart & Schulz, 2019; Telligman et al., 2017).

In addition to the value-added attributes, the items uncovered by Ardeshiri et al. (2019) were also utilized in the IPA. These attributes included marbling, brands and certain labeling were desired from consumers. Specific traits that need to be evaluated by consumers are derived from the value-added definition.

This study combines the Diffusion of Innovation Theory and the Importance-Performance Analysis to enable the researchers to gather a wide range of data from Iowa beef consumers. This data collection enables the researchers to truly understand who Iowa consumers are, what their habits are, what they believe are important, and what strategies are they satisfied with. Getting personalized data from Iowa consumers will allow for a better understanding who the individuals are within the social system.
Purpose and Objectives

The purpose of this study was to explore and describe Iowa beef consumers’ habits and their perceptions towards beef products. The study was guided by the following objectives:

1. Describe how and where Iowa consumers buy beef.
2. Identify where Iowa consumers get their information regarding beef products.
3. Describe Iowa consumer preference for protein buying.
4. Determine if there is a relationship between where consumers get their information and buying locations for beef.
5. Determine the priority of marketing topics for an Extension program.
6. Describe what Iowa consumers are willing to pay for certain marketing brands of beef.

Methods and Procedures

Participants

Participants in this study were a non-probability purposeful sample of Iowans who were above 18 years of age. The requested sample size was 1,100. Researchers contracted with Qualtrics to handle participant recruitment, sampling, and data collection. The criteria for the participant selection included age (18 years or older) and residence (living in Iowa), buying beef in the last 5 months. Three quotas were also given to Qualtrics to match the Iowa census data, which included: gender (49.6% Male and 50.4% Female); age (76.8% 18-64, 17.0% 65-84, and 2.4% over 85 with a median age of 38.1 years); and race (90.2% White alone, 3.6% Black or African American alone, 0.4% American Indian and Alaska Native alone, 2.5% Asian alone, 0.1% Native Hawaiian and Other Pacific Islander alone, 2.2% Two or more races, and 5.9% Hispanic or Latino) (State of Iowa, 2017). The criteria given to Qualtrics were retrieved from the Iowa census data. The age percentages do not equal 100% as the group of individuals less than 18 were not included in the study. In addition, people were able to report more than one race in
the Iowa census. Qualtrics did filter respondents based on their competition and speed of taking
the survey.

Once Qualtrics received our criteria for the participants they started recruiting. Qualtrics
recruits participants through website intercept recruitment, member referrals, targeted email lists,
gaming sites, loyalty web portals, permission-based networks, social media, etc. (Qualtrics, n.d.).
To ensure the sample of participants did not have duplicate participants, Qualtrics utilized digital
finger printing technology. From the recruitment pool of participants, Qualtrics sent out
invitations to participate in the study. Approval to conduct the research was granted prior to
conducting the study (IRB # 20-188, Appendix C).

Instrument

The instrument consisted of four sections focusing on the participants’ demographics,
importance-performance analysis (4-point Likert-type scale), consumer habits (Quantitative
descriptive questions) and future behavior questions (willingness to pay quantitative descriptive
questions) (Figure 4.1). The first step that the researchers took was to work with a five-member
expert panel to evaluate the instrument for content and face validity. Two were experts in value
added agriculture practices (Kendra Meyer and Christa Hartsook), two were beef faculty from
Iowa State University (Drs. Dan Loy and Brad Skaar) and one was an Extension professional
(Keli Tallman) who specialized in evaluations. Appendix A contains the evaluation rubric that
the panel was asked to complete. The expert panel determined that the instrument was face and
content valid after rewording items to increase clarity.

Next, the researchers completed a testing of the questions and the overall questionnaire.
Field testing questionnaires and questions helps “diagnose and solve problems prior to the survey
going into the field” (Dillman et al., 2014). Five individuals completed the questionnaire. While
completing the questionnaire, the individuals were encouraged to ask questions of clarification.
The purpose for the field test was not to collect data; rather, it was to enhance clarity of the questionnaire. The field test participants collectively determined that the instrument overall had clarity. Participants also made suggestions throughout the instrument to further increase clarity.

After the instrument was validated by a panel of experts and the instrument was field tested, a pilot study was completed to ensure the success of the instrument prior to conducting the research study and for reliability of the instrument through a test-retest method (Dillman et al., 2014). During the pilot study, the survey was sent to 30 participants. Participants in the pilot study were sent an initial email with the purpose of the study, confidentiality statement, risk, voluntary participation statement, and a link to the survey. Once the participants responded to the survey online, we waited seven days to send the second round of the survey. For example, if a participant completed the survey on day two, then they were sent their second round on day nine.

From the data collected from the pilot study, the reliability coefficients were calculated for the instrument utilizing the test-retest method. The purpose of utilizing test-retest is to assure consistency of responses over time. There were 13 participants in both rounds. The agreeance level was 84.6%, which was above the acceptable threshold of 75% (Rossi et al., 1999).

The entire instrument was compared between both rounds to achieve the level of agreeance. For Likert-type items, to achieve agreeance between both rounds the researchers allowed adjacent numbers to count as agreed. For example, if the participant rated an item a 5 for round one and then a 4 for round two, this would be considered agreement between the two rounds. Other items in the instrument must have the same response to achieve agreement between the two rounds.

Data Collection

The survey was administered through an online Qualtrics survey. This approach did not include a pre-notice email, and follow-ups were determined after the initial survey was sent
(Dillman et al., 2009). The first email included the confidentiality statement, risk, voluntary participation statement, purpose of the study, length of study and a link to the survey. Incentives were provided by Qualtrics and selected by participants. Incentives that participants could select included a range of options such as gift cards, air mileage points, or membership credit. Qualtrics continued data collection until the sample size was met according to the criteria and quotas that were provided to them. Data were collected Fall 2020.

**Data Analysis**

The data from this study were analyzed with SPSS. Objectives one (Describe how and where Iowa consumers buy beef), two (Identify where Iowa consumers get their information regarding beef), and three (Describe Iowa consumer preference in protein buying) were all analyzed through percentages.

Objective four (Determine if there is a relationship between where consumers get their information and their current habits of where they buy beef) was analyzed by running a Chi-Square test to see if there was a significant relationship between the two categorical variables of where consumers get their information and buying beef location. In addition, the phi coefficient was utilized to measure the association between the two variables.

For objective five (Determine the priority of marketing topics for an Extension program) the mean scores were calculated. Each attribute had a score for importance and for satisfaction. Each attribute was then plotted in a four-quadrant grid using the Importance-Performance Analysis. The importance score was on the y-axis and the satisfaction score was on the x-axis with the two axes meeting at the score of 2.5. Objective six (Describe what Iowa consumers are willing to pay for a certain marketing brands of beef) was analyzed with percentages for each of the questions.
Results

Participants

For this study, Qualtrics identified 2,091 participants who accepted the survey invitation, with a 52% response rate of good completes that equaled 1,100 participants. Surveys were filtered by Qualtrics for qualifications of the study (Iowan, over 18, have bought beef in the last 5 months), speed of taking the survey (too fast were eliminated), and complete participation of answering all the questions. Good completes included participants over the age of 18 who went at an appropriate speed, and answered all the questions. After further data screening from the researchers, two participants were removed because they were younger than 18 years of age. The quotas to reflect Iowa census data were closely met for this study.

The demographic data revealed 50.1% of participants were female, 49.2% were male, 0.4% identified as other, and 0.4% preferred not to answer. Participants came from all six Iowa State University Beef Center Extension regions (Figure 5.1). Approximately 10% of participants came from region one while 10%, 28%, 7%, 30%, and 17% came from regions 2, 3, 4, 5, and 6, respectively.

Among the participants, 25.3% had a household income of less than $30,000 per year. Regarding income, 27.2% made between $30,001 and $60,000, 24.5% between $60,001 and $100,000, 17.4% had $100,000 or more, and 5.6% preferred not to answer. 81.5% of the participants were 18 to 64 years old, 17.4% were 65 to 84, and 1.1% were 85 years old and over. The median age of participants was 43 years.

The participant breakdown by ethnicity consisted of: 0.2% American Indian or Alaska Native, 2.4% Asian, 3.0% Black or African American, 5.7% Latino or Hispanic, 0.2% Native Hawaiian or Pacific Islander, with 2.1% reporting two or more races. The majority (85.7%) identified as White, and 0.7% preferring not to answer.
Participants in this study had different household structures for the number of adults and children in the household. Among the participants, 6.5% had 1 adult with kids, 19.9% had one adult and no kids, 33.0% had two adults with kids, 30.1% had two adults with no kids, 7.4% of selected other to describe their household structure as other (including more than two adults with and without kids), and 3.2% of the participants selected prefer not to answer.

Among the participants, 65% were the primary grocery decision maker, 29.1% shared the responsibility, 5.4% were not the primary grocery decision maker, and 0.5% preferred not to answer. Participants’ frequency of buying beef included 1.9% buying once a year, 4.7% buying twice a year, 32.4% buying once a month, 47% buying once a week, 13.7% buying more than once a week, and 0.3% preferred not to answer.

**Objective One**

Participants were asked if they had ever bought beef from a grocery store, specialty grocery store, farmer’s market and directly from the producer. A follow-up question asked why
they did or did not purchase beef from the identified location. Participants were able to select multiple reasons why they did or did not purchase beef from each location. As a result, the percentages for each location do not reach a total of 100 (Table 5.1). Participants who selected “prefer not to answer” the initial question were not considered for the follow-up questions.

The first question participants were asked was, “Have you ever bought beef from a grocery store (HyVee, Fareway, etc.)?” Among the participants, 1,084 (98.7%) answered “Yes” that they have bought beef from a grocery store. Then participants were asked why they bought from a grocery store. Participants who bought from a grocery store did so because of convenience (69.4%), cost (61.4%), and easy accessibility (45.8%) (Table 5.1). The group of participants who have not bought beef from a grocery store was comprised of 11 participants (1%). These participants indicated that they did not buy from a grocery store because they were unaware of this purchasing opportunity (18.2%), convenience (18.2%) and other (36.4%) (Table 5.1). Three (0.03%) participants preferred not to answer the initial question, “Have you ever bought beef from a grocery store?”

The second question participants were asked was, “Have you ever bought beef from a specialty grocery store (Whole Foods, Trader Joes, etc.)?” A total of 306 (27.9%) answered yes. This group of participants that had bought from a specialty grocery store did so due to convenience (48.4%), cost (45.1%), and easy accessibility (25.8%) (Table 5.1). There were 783 (71.3%) participants who answered “no” to buying from a specialty grocery store. They had not bought from this location due to lack of accessibility (49.9%), cost (30.7%) and being unaware of this purchasing opportunity (18.6%) (Table 5.1). Only 9 (0.8%) participants answered preferred not to answer the initial question, “Have you ever bought beef from a specialty grocery store?”
The third question participants were asked was, “Have you ever bought beef from a farmer’s market?” A total of 201 (18.3%) answered yes. Participants who had bought beef from a farmer’s market purchased at this location due to convenience (48.3%), cost (39.3%), and easy accessibility (33.8%) (Table 5.1). Among the participants, 890 (81.1%) answered “no” to ever buying beef from a farmer’s market. The number of participants who had not bought beef from this location because they were unaware of the purchasing opportunity (44.3%), lack of accessibility (40.0%) and cost (11.7%) (Table 5.1). Only 7 (0.6%) participants preferred not to answer the initial question, “Have you ever bought beef from a farmer’s market?”

The fourth question participants were asked was, “Have you ever bought beef directly from a producer?” A total of 398 (36.2%) participants answered yes that they had bought beef from a producer. Among participants who bought directly from a producer did so because of cost (63.8%), convenience (49.0%), and easy accessibility (32.7%) (Table 5.1). A total of 692 (63.0%) answered no to ever buying directly from a beef producer. The participants who have not bought from a producer did not buy due to lack of accessibility (47.8%), they were unaware of the purchasing opportunity (35.3%), and cost (13.8%) (Table 5.1). Only 8 (0.01%) participants preferred not to answer the initial question, “Have you ever bought beef directly from a producer?”

It should also be noted that participants were first asked if they had ever bought beef from a grocery store, specialty grocery store, farmer’s market and directly from a producer. Then they were asked a follow up question of reasons why they bought/ did not buy from those locations. Table 5.1 is comprised of percentages from the follow-up question asking why consumers did/did not buy from a specific location. Participants were allowed to select multiple reasons, resulting in totals that do not equal 100%. The responses were categorized as “yes” and “no”
from the initial question to organize the data to indicate reasons other than buying as well as reasons from participants who did not buy.

Table 5.1. Specific reasons why Iowa beef consumers buy/ do not buy from different locations.

<table>
<thead>
<tr>
<th>Reasons for buying location</th>
<th>Buying Locations</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Grocery Store</td>
</tr>
<tr>
<td>Cost</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>61.4</td>
</tr>
<tr>
<td>Convenience</td>
<td>69.4</td>
</tr>
<tr>
<td>Easy Accessibility</td>
<td>45.8</td>
</tr>
<tr>
<td>Lack of Accessibility</td>
<td>4.8</td>
</tr>
<tr>
<td>Unaware of Purchasing</td>
<td>3.2</td>
</tr>
<tr>
<td>Opportunity</td>
<td>Prefer not to Answer</td>
</tr>
<tr>
<td>Other</td>
<td>5.4</td>
</tr>
</tbody>
</table>

Part two of the objective was to describe how participants buy beef. Participants were asked, “What method do you use most frequently to buy beef?” The options included in person, online using a desktop or laptop computer, online using a mobile phone app, other or prefer not to answer. For this question, 89.1% of the participants most frequently buy beef in person, 4.8% buy online using a desktop or laptop computer, 4.5% use a mobile phone app, 1.4% selected other, and 0.3% selected preferred not to answer.

**Objective Two**

The second objective was to identify where Iowa consumers get their information regarding beef products. Participants were asked, “What source do you mainly turn to when you want to learn more about beef products?” Iowa consumers’ top three sources included: grocery
store employees (26.1%), websites (25.3%), and friends, family, and neighbors (24.1%) (Table 5.2).

<table>
<thead>
<tr>
<th>Sources</th>
<th>Percentages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grocery store employees</td>
<td>26.1%</td>
</tr>
<tr>
<td>Websites</td>
<td>25.3%</td>
</tr>
<tr>
<td>Friends, Family, Neighbors, etc.</td>
<td>24.1%</td>
</tr>
<tr>
<td>Producers</td>
<td>6.9%</td>
</tr>
<tr>
<td>Social media</td>
<td>4.7%</td>
</tr>
<tr>
<td>Other</td>
<td>4.5%</td>
</tr>
<tr>
<td>TV</td>
<td>4.2%</td>
</tr>
<tr>
<td>Prefer not to Answer</td>
<td>2.9%</td>
</tr>
<tr>
<td>Commodity Associations</td>
<td>0.8%</td>
</tr>
<tr>
<td>Radio</td>
<td>0.4%</td>
</tr>
</tbody>
</table>

Table 5.2. Percentage breakdown of beef product information sources for Iowa consumers.

Objective Three

The third objective for the study sought to describe Iowa consumer preference for protein buying. Participants were asked to rank in order how frequently they buy the following proteins: poultry (chicken and/or turkey), beef, lamb, pork, fish. The participants in the study were not asked about the pounds that they consume. The frequency of rankings are shown in Table 5.3.

The results indicated that the largest amount of participants (43.6%) most frequently buy poultry and 1.0% of my participants ranked fish being the most frequently bought protein. Whereas the largest group of participants (60.5%) least frequently buy pork and 2.5% of the participants in the study least frequently buy poultry (Table 5.3).

<table>
<thead>
<tr>
<th>1 (Most Frequent)</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5 (Least Frequent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poultry (43.6%)</td>
<td>Poultry (48.0%)</td>
<td>Fish (77.3%)</td>
<td>Lamb (48.7%)</td>
<td>Pork (60.5%)</td>
</tr>
<tr>
<td>Beef (33.8%)</td>
<td>Beef (34.1%)</td>
<td>Pork (14.7%)</td>
<td>Beef (22.5%)</td>
<td>Fish (17.1%)</td>
</tr>
<tr>
<td>Lamb (18.5%)</td>
<td>Lamb (14.9%)</td>
<td>Lamb (5.6%)</td>
<td>Pork (19.2%)</td>
<td>Lamb (12.2%)</td>
</tr>
<tr>
<td>Pork (3.0%)</td>
<td>Pork (2.7%)</td>
<td>Beef (1.9%)</td>
<td>Poultry (5.3%)</td>
<td>Beef (7.6%)</td>
</tr>
<tr>
<td>Fish (1.0%)</td>
<td>Fish (0.4%)</td>
<td>Poultry (0.5%)</td>
<td>Fish (4.2%)</td>
<td>Poultry (2.5%)</td>
</tr>
</tbody>
</table>
Note: Participants ranked the proteins in order of protein buying frequencies. The frequency levels are organized in each column and arranged on the amount of participants who ranked that protein source as the different rankings.

**Objective Four**

The fourth objective sought to determine if there was a relationship between where consumers get their information and buying beef at the grocery store, specialty grocery store, farmer’s markets, and directly from beef producers (Table 5.4). A Chi-square test was utilized to determine whether the relationship between the two variables was statistically significant. From there we utilized the phi coefficient to determine the strength of the association between the two variables. There was a positive association between getting information about beef products from social media and buying from specialty grocery stores and farmer’s market which means that social media positively impacts their actions for buying at specialty grocery stores and farmer’s markets. There was a negative association between getting information from commodity associations and buying from a grocery store. There was a positive association between getting information from producers and buying directly from producers. However, getting information from grocery store employees and TV had a negative association with consumers buying directly from producers. There was a positive association between getting information from the radio and buying from a specialty grocery store. When getting information from friends, family, neighbors, etc. there was a negative association with buying from specialty grocery stores and a positive association with buying directly from a producer. Although items that were talked about in this section were statistically significant, the strength of the associations were either negligible or weak (Rea & Parker, 2014).
Table 5.4. Associations between Information source and buying locations.

<table>
<thead>
<tr>
<th>Information Sources</th>
<th>Buying Location</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Grocery Store</td>
</tr>
<tr>
<td>Websites</td>
<td>0.00</td>
</tr>
<tr>
<td>Social media</td>
<td>-0.02</td>
</tr>
<tr>
<td>Commodity associations</td>
<td>-0.19^a</td>
</tr>
<tr>
<td>Producers</td>
<td>0.03</td>
</tr>
<tr>
<td>Grocery store employees</td>
<td>0.00</td>
</tr>
<tr>
<td>TV</td>
<td>0.02</td>
</tr>
<tr>
<td>Radio</td>
<td>0.01</td>
</tr>
<tr>
<td>Friends, Family, Neighbors, etc.</td>
<td>0.04</td>
</tr>
</tbody>
</table>

Note: phi coefficients are reported; ^ Significant at p<0.05.

Objective Five

The fifth objective’s goal was to determine the priority of marketing topics for an Extension program. Participants were asked two questions about their satisfaction and their importance priority over 14 different attributes (Table 5.5). The participants rated the items on a 4-point Likert-type scale. The mean scores for each attribute were plotted on a four-quadrant graph. Each quadrant provided feedback to where the focus should be according to consumers over the 14 beef attributes.

Table 5.5. Codes for the 14 IPA Beef Attributes.

<table>
<thead>
<tr>
<th>Code</th>
<th>IPA Attribute</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Freshness</td>
</tr>
<tr>
<td>2</td>
<td>Taste</td>
</tr>
<tr>
<td>3</td>
<td>Grown in the USA</td>
</tr>
<tr>
<td>4</td>
<td>Price</td>
</tr>
<tr>
<td>5</td>
<td>Branded Natural</td>
</tr>
<tr>
<td>6</td>
<td>Organic</td>
</tr>
<tr>
<td>7</td>
<td>Grass Fed</td>
</tr>
<tr>
<td>8</td>
<td>Quality Grades (i.e., Prime, Choice, Select)</td>
</tr>
<tr>
<td>9</td>
<td>Tenderness</td>
</tr>
<tr>
<td>10</td>
<td>Locally grown (Raised near you)</td>
</tr>
<tr>
<td>11</td>
<td>Further processed (i.e., beef sticks, marinated beef, etc.)</td>
</tr>
<tr>
<td>12</td>
<td>Purchasing directly from producers</td>
</tr>
<tr>
<td>13</td>
<td>Feed given to the animal</td>
</tr>
<tr>
<td>14</td>
<td>Branded product (i.e., Certified Angus Beef, Certified Hereford Beef)</td>
</tr>
</tbody>
</table>
After completing the analysis and plotting the attributes (Figure 5.2), the Importance-Performance analysis was utilized to determine what attributes were needed to focus on for an Extension program. Most of the attributes were determined to be in the “Keep up the Good Work” quadrant. This shows that what is currently being done with the attributes should continue to be done. The attribute “Organic” fell into the “possible overkill” quadrant. Although the attributes of Grass Fed (7), Further Processed (11) and Purchase directly from a producer (12) were in the “Keep up the Good work” quadrant, they were very close to the “Possible overkill” quadrant.

**Objective Six**

The sixth objective seeks to describe what Iowa consumers are willing to pay for a certain marketing brand of beef. Participants were given a scenario of specific type of beef cut and a price. With the same scenario, the participants were asked how much more they would pay based on different branding types such as Organic, Natural, Certified Angus Beef, Direct from Producers, and Delivered home. Descriptive statistics for each branding type are presented in Table 5.6. The majority of participants were willing to pay more per pound for each of the branding types that were studied.

**Discussion**

**Objective One**

According to this study, the common reasons across all the different types of beef buying locations such as grocery stores, specialty grocery store, farmer’s markets and directly from producers. were cost, convenience, and accessibility (lack and easy). These reasons were items that impacted consumers in Iowa to either buy or not buy beef at these locations.
Figure 5.2. IPA Analysis Chart for Beef Attributes from Iowa Consumers.
Table 5.6. Percentages of Iowa consumers’ willingness to pay more for different branding types.

<table>
<thead>
<tr>
<th>Branding Types</th>
<th>Price Ranges</th>
<th>$0.00</th>
<th>$0.01-$0.35</th>
<th>$0.36-$0.70</th>
<th>$0.71-$1.05</th>
<th>$1.06-$1.40</th>
<th>&gt;$1.40</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Organic</td>
<td></td>
<td>41.3%</td>
<td>12.2%</td>
<td>14.3%</td>
<td>13.7%</td>
<td>8.2%</td>
<td>6.2%</td>
</tr>
<tr>
<td>2. Natural</td>
<td></td>
<td>40.6%</td>
<td>17.9%</td>
<td>15.0%</td>
<td>10.4%</td>
<td>7.1%</td>
<td>5.6%</td>
</tr>
<tr>
<td>3. Certified Angus Beef</td>
<td></td>
<td>25.9%</td>
<td>21.8%</td>
<td>17.1%</td>
<td>15.4%</td>
<td>9.1%</td>
<td>7.7%</td>
</tr>
<tr>
<td>4. Direct from producers</td>
<td></td>
<td>28.2%</td>
<td>15.8%</td>
<td>16.8%</td>
<td>14.7%</td>
<td>12.4%</td>
<td>8.7%</td>
</tr>
<tr>
<td>5. Delivered home</td>
<td></td>
<td>31.1%</td>
<td>16.3%</td>
<td>12.8%</td>
<td>15.4%</td>
<td>10.4%</td>
<td>9.7%</td>
</tr>
</tbody>
</table>

Note: Participants were asked if they were willing pay more for the different branding types with a base price of $6.99/lb for sirloin steak.

The findings from this study align from results in previous studies. Due to the availability of different shopping sources a study found that price, proximity from the home, and availability in their community really impacted where Iowa consumers bought their groceries (Palmer & Winham, 2020). Another study that looked at consumers across the United States found that a majority of meat buying was from a conventional grocery store (Upah, 2016).

Data from the current study provide an insight as to why consumers buy beef from different locations. The main factor for all locations was cost and convenience. The second tier of reasons are accessibility whether the easy accessibility impacted buying or the lack of accessibility impacted not buying. As described by the Diffusion of Innovation theory, a social system that adopters live in will impact the rate of accepting or rejecting the new innovation. Findings from this study provide continued confirmation that specific reasons can impact the consumer’s decision to buy or not buy from different locations for beef products.

**Objective Two**

The second objective found that the top three sources of information about beef products are grocery store employees, websites, and friends, family, neighbors, etc. The findings of this
Objective provide producers, Extension personnel, educators, etc. with guidance to where consumers are actually getting their information about beef products. With beef producers changing their course of action to utilize the communication avenues that consumers are using this could lead to assisting consumers in increasing their knowledge.

Past study results align with what this current study found. For example, Harsh (2018) found that US beef consumers most often get information from friends, family, and news reporters. They also used communication channels such as websites, TV news, and radio. Another study Rockers et al. (2020) looked at how women received information about their food. This study found that women both receive and then share information with friends and family. These participants also stated that they find most of their food information online. Another study found that family, friends, co-workers, butchers, and websites such as “BeefUSA.org” were the most valuable sources to get information about beef. They also indicated that radio and blogs were the least used sources (Upah, 2016).

Although there were minor differences between the types of sources found in previous studies compared to this current study; overall, the similarity of online platforms and close people aligns with past research and the current research. The current findings provide concrete data points regarding where participants are getting their information. This provides a general insight and continues to confirm what other studies have found about specific communication avenues.

Objective Three

The key findings from objective three is that the top two most frequently bought meat proteins include poultry (turkey and chicken) and beef. The findings do provide confirmation from the USDA report about per capita disappearance of red meats and poultry data. Disappearance is defined as the amount of domestic markets sold in a grocery store or restaurant.
The top two proteins in this report were indicated to be poultry and beef similar to the current study (USDA ERS, 2018).

Data from this study compared to the USDA study provide confirmation of overall consumer trends. All individuals in a social system are not identical, so identifying their behavioral trends is important (Rogers, 2003). The findings from this study inform that not all consumers rank protein buying in the same manner. These unique traits of consumers confirm the importance of understanding the unique behaviors within a social system.

**Objective Four**

For objective four, there were some significant associations between where consumers get their information and their beef buying locations. All the associations were weak. Past studies have shown that different information sources impact participant behavior. Wang et al. (2018) noted a positive association between healthy eating advertisement and participants’ behavior regarding improving their overall health. However, another study found that although media did have an impact on consumers’ habits, the core impact of their everyday activities was due to their cultural background and the environment in which they lived (Chiles, 2017). Although the findings from the current study does not fully align with past research (there was no association found in this study whereas there were in other studies), we can assume that from previous research that there are many different items such as advertisement and information location, that impact consumer beef buying locations, and not just where people get their information.

The findings from this study, nevertheless, provide information about the relationship between where people get their information and the impact it has on buying locations. This information can be provided to beef producers who want to interact with others in the social system. This study did find that, for people who get information from social media, there is a positive association with their actions of buying at the farmer’s market. Farmers who sell at a
farmer’s market could utilize social media to induce consumers buy from them. Another item from this study for beef producers to utilize is that consumers who learn about their product from producers have a positive association buying directly from them or fellow producers. In addition, consumers who learn about beef products from their friends and family have a positive impact on buying directly from producers as well. By understanding these characteristics, beef producers could change their actions, thus providing information to consumers about beef products that could have a greater impact on the action of consumers’ buying tendency from certain locations.

Objective Five

The key findings from objective five were that all attributes except for the organic attribute were in the “Keep up the Good Work quadrant”. The organic attribute fell into the “Possible overkill” quadrant, which indicates that producers are doing a good job; however, the importance level is not as high for consumers. The findings from this study suggests decreasing the amount of work that producers are doing regarding marketing of organic. However, this statement about the organic attribute contradicts findings of a study by Jaenicke and Carlson (2015) which revealed that the organic market is flat due to consumer demands, wherein the organic premium is actually increasing across a variety of food products. However, Lim et al. (2018) found that organic was not important to consumers who buy at a traditional grocery store. Findings from the current study provide confirmation that organic is important to the consumer; however, it might not need as much marketing as other attributes. It is important to information about organics as described in past studies, whereas the amount of marketing work could decrease in regards to these organics.

The attributes that fell in the “keep up the good work” quadrant from this study align with previous studies. The current findings confirmed that consumers determined these attributes were important to them and that they were satisfied with the marketing strategies in place. In this
study, the highest attributes for both importance and performance were taste and freshness. This confirms Gvili et al. (2017) study that freshness and taste are the highest importance for consumers. In other industries our findings were the exact same finding as Qu et al. (2017) revealed when consumers evaluated blueberry attributes. In addition, the other attributes were very important such as USDA certification labeling, marbling, and brands as noted in a study by Ardeshiri et al. (2019).

The findings of the current study were also similar to Telligman et al. (2017) who looked at desirable indicators when consumers were buying local beef. The important indicators that drove consumers to buy local beef were that the animals were raised in a near geographical area, the product was fresh as it did not have to be shipped, the specific production methods of raising the animals, and the feed that they were fed and being antibiotic free (Telligman et al., 2017). The findings from the current study confirm what other researchers discovered as important attributes to beef consumers. Results from this study affirmed that producers are doing a great job and should keep up the good work because it is very important to consumers.

**Objective Six**

The final objective of the study revealed that, overall, the majority of Iowa consumers said they would pay more for the different branding types. The data from this current study are similar to past studies. Lim et al. (2018) found that the major impact of willingness to buy is the specific location from which consumers bought beef—the majority bought from a traditional grocery store. However, the participants who bought at a farmer’s market were willing to pay $2.04/lb. more for beef that was grass fed, organic, and local. It was also revealed that online and direct delivery of products was not seen as positive because consumers did not like the idea of shipping the product and worried about the food safety of the product. Numerous studies
(Carlson, 2016; Jaenicke & Carlson, 2015) indicated there are increasing markets as well as a demand for organic labeling of products.

This study provides information that supports other research that has been done regarding the willingness of consumers to pay more for different types of marketing brands. Further research should be carried out to identify whether location of buying beef impacts willingness to pay more money.

Conclusions, Implications, and Recommendations

In conclusion, Iowa consumers have many different characteristics in regards to beef buying. Iowa consumers mainly shop in person and in traditional grocery stores. These decisions are driven by cost, convenience, and accessibility. When trying to learn about beef products, these consumers will most likely get their information from peers they are close to or from websites. When considering buying frequencies in regards to protein, Iowa consumers will most likely buy beef and poultry products more often compared to other proteins. There is also weak association between where people get their information and where they buy their beef products. Current beef attributes are still important to consumers, and marketing strategies are at a satisfaction level based on consumer perception. However, organic marketing strategies could be decreased regarding overall approach. Lastly, Iowans are willing to pay more for organic, natural, Certified Angus beef, direct from the producer, and delivered to their door.

Recommendations for further research include:

• Objective One: A further study is recommended to explore the frequency of buying at different locations.

• Objective Two: Further studies are recommended to explore which sources of information consumers see as trustworthy sources.
Objective Three: A study is recommended to identify how frequent people consume the different protein products to see if there is a correlation between consumption and buying actions.

Objective Four: We recommend further studies that look at what factors impact locations of buying beef.

Objective Five: Further research is recommended to explore if there is an importance level to consumers in regard to other items such as labeling, consumer education, product knowledge, etc.

Objective Six: A follow up study is recommended to see if there are other factors that impact consumers’ willingness to pay more.

Recommendations for practice include:

• We recommend providing educational information to consumers about the cost, benefits, and accessibility of different buying locations.

• Educating beef producers on effective communication to match how consumers get their information about beef products is recommended. For example, more training on websites and how to address consumer to consumer communication/education.

References


Qualtrics. (n.d.). *Everything you need to know when working with your IRB*. https://www.qualtrics.com/


Appendix A. Consumer Study Instrument

[Note: The items are in the order written by the author and placed into the Qualtrics measurement instrument; therefore, they are not in numerical order.]

Q34 The purpose of this study is to explore and describe Iowa beef consumers’ habits and perceptions towards beef products. The survey consists of four sections of questions and will take you no longer than 15 minutes.

Completion of this study is voluntary. You may select "prefer not to answer" on any questions or simply stop completion of the survey at any point throughout the process. All survey responses will be confidential and any data that is shared will be aggregated together and shared as a group. A reminder that Qualtrics will maintain the completed survey response in their database that has the highest security.

If you have any questions or concerns about this project, feel free to contact Sarah Smith at sjalmaz@iastate.edu or Dr. Greg Miller at gsmiller@iastate.edu. Thank you for your time taking this survey. If you agree with all the terms above, please proceed to the next page to start the survey.

Q43
We care about the quality of our survey data and hope to receive the most accurate measure of your opinions, so it is important to us that you thoughtfully provide your best answer to each question in the survey.

Do you commit to providing your thoughtful and honest answers to the questions in this survey?

- I will provide my best answers
- I will not provide my best answers
- I can't promise either way

State in which state do you currently reside?

- Alabama ... I do not reside in the United States

Q1 Did you buy beef in the last 5 months?

- Yes
- No
Q3 What is your gender identity?

- Male
- Female
- Other
- Prefer not to Answer

Q4

Based on the map above, what region are you currently living in?

- 1
- 2
- 3
- 4
- 5
- 6
- Prefer not to Answer
Q5 What is your current household income?

- Less than $30,000
- $30,001-$60,000
- $60,001- $100,000
- More than $100,000
- Prefer not to Answer

Q6 Please enter your age in years. (Enter a number. If you prefer not to answer simply type N/A).

Q39 Which of the following do you identify with?

- White
- Black or African American
- American Indian or Alaska Native
- Asian
- Native Hawaiian or Pacific Islander
- Latino or Hispanic
- Two or more races
- Prefer not to Answer
Q7 What is your household structure?

- Two adults with kids
- One adult with kids
- Two adults no kids
- One adult no kids
- Other (please describe in the following text box)
- Prefer not to Answer

Q8 Are you the primary grocery decision maker in regards to what is bought?

- Yes
- No
- I share the responsibility
- Prefer not to Answer

Q9 What source do you mainly turn to when you want to learn more about beef products?

- Websites
- Social media
- Commodity associations
- Producers
- Grocery store employees
- TV
- Radio
- Friends, Family, Neighbors, etc.
- Other (please specify in the following text box)
- Prefer not to Answer
Q10 When you are purchasing beef, how important are each of the following attributes?

<table>
<thead>
<tr>
<th></th>
<th>Unimportant</th>
<th>Somewhat Unimportant</th>
<th>Somewhat Important</th>
<th>Important</th>
<th>Prefer not to Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freshness</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Taste</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grown in USA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Price</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Branded Natural</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organic</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grass Fed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quality grade (i.e. Prime, Choice, Select)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tenderness</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Locally grown (Raised near you)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Further processed (i.e. beef sticks, marinated beef, etc.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Purchasing directly from producers</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feed given to the animal</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Branded product (i.e. Certified Angus Beef, Certified Hereford Beef)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Q11 How satisfied are you with the following beef attributes sold by your retailer of choice?

<table>
<thead>
<tr>
<th></th>
<th>Very dissatisfied</th>
<th>Dissatisfied</th>
<th>Satisfied</th>
<th>Very satisfied</th>
<th>Prefer not to Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freshness</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Taste</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Grown in USA</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Price</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Branded Natural</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Organic</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Grass Fed</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Quality grade (i.e. Prime, Choice, Select)</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Tenderness</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Locally grown (Raised near you)</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Further processed (i.e. beef sticks, marinated beef, etc.)</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Purchasing directly from producers</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Feed given to the animal</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Branded product (i.e. Certified Angus Beef, Certified Hereford Beef)</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>
Q12 How often do you buy beef?

- About once a year
- About twice a year
- About once a month
- About once a week
- More than once a week
- Prefer not to Answer

Q13 Have you ever bought beef from a grocery store (HyVee, Fareway, etc.)?

- Yes
- No
- Prefer not to Answer

Q14 Why did you decide/ not decide to purchase beef from a grocery store? (Check all that apply)

- Cost
- Convenience
- Lack of Accessibility
- Easy accessibility
- Unaware of this purchasing opportunity
- Other (please explain in the following text box)

- Prefer not to Answer
Q24 Have you ever bought beef from a **specialty grocery store** (Whole Foods, Trader Joes, etc.)?

- Yes
- No
- Prefer not to Answer

---

Q25 Why did you decide/ not decide to purchase beef from a **specialty grocery store**? (Check all that apply)

- Cost
- Convenience
- Lack of accessibility
- Easy accessibility
- Unaware of this purchasing opportunity
- Other (please explain in the following text box)

---

Q26 Have you ever bought beef from a **farmer’s market**?

- Yes
- No
- Prefer not to Answer
Q27 Why did you decide/ not decide to purchase beef from a farmer's market? (Check all that apply)

☐ Cost
☐ Convenience
☐ Lack of accessibility
☐ Easy accessibility
☐ Unaware of this purchasing opportunity
☐ Other (please explain in the following text box)

☐ Prefer not to Answer

Q28 Have you ever bought beef directly from a producer?

☐ Yes
☐ No
☐ Prefer not to Answer

Q29 Why did you decide/ not decide to purchase beef directly from a producer? (Check all that apply)

☐ Cost
☐ Convenience
☐ Lack of accessibility
☐ Easy accessibility
☐ Unaware of this purchasing opportunity

☐ Other (please explain in the following text box)

☐ Prefer not to Answer

Q30 What method do you use most frequently to buy beef?

☐ Online using a desktop or laptop computer

☐ Online using a mobile phone app

☐ In person

☐ Other (please specify in the following text box)

☐ Prefer not to Answer

Q31 With using the desktop or laptop, which of these do you use?

☐ In person pick-up

☐ Home delivery

☐ Prefer not to Answer

Q35 Which website do you use? If prefer not to answer, simply type N/A.
Q32 With using a mobile phone app, which of these do you use?

☐ In person pick-up

☐ Home delivery

☐ Prefer not to Answer

Q36 Which app do you use? If you prefer not to answer, simply type N/A.

________________________________________

Q33 What type of grocery store? (i.e. specialty, regular, etc.) (If you prefer not to answer, simply type N/A)

________________________________________

Q38 Would you be willing to rank the order in how frequently you buy different proteins? If you prefer not to answer this question, select no to proceed to the next set of questions.

☐ Yes

☐ No

Q17 Rank the order in how frequently you buy the following proteins? Drag the answers in order of frequency (1 most frequent - 5 least frequent).

_____ Poultry (chicken and/or turkey)

_____ Beef

_____ Lamb

_____ Pork

_____ Fish
Q18 Assume you go to the grocery store and find a sirloin steak for $6.99/lb. How much more per pound would you be willing to pay if the steak is branded organic?

- $0.00
- $0.01- $0.35
- $0.36- $0.70
- $0.71- $1.05
- $1.06- $1.40
- >$1.40
- Prefer not to Answer

Q19 Assume that you go to the grocery store and find a sirloin steak for $6.99/lb. How much more per pound are you willing to pay if the steak is branded natural?

- $0.00
- $0.01- $0.35
- $0.36- $0.70
- $0.71- $1.05
- $1.06- $1.40
- >$1.40
- Prefer not to Answer
Q21 Assume you go to a grocery store and find a sirloin steak for $6.99/lb. How much more per pound would you be willing to pay if the steak is branded **Certified Angus Beef**?

- $0.00
- $0.01-$0.35
- $0.36-$0.70
- $0.71-$1.05
- $1.06-$1.40
- >$1.40
- Prefer not to Answer

Q22 Assume that you go directly to a beef producer and buy a sirloin steak that is $6.99/lb in the grocery store. How much more per pound would you be willing to pay for the steak **directly from a local beef producer and not the grocery store**?

- $0.00
- $0.01-$0.35
- $0.36-$0.70
- $0.71-$1.05
- $1.06-$1.40
- >$1.40
- Prefer not to Answer
Q23 Assume you order beef to be delivered directly to your door. How much more are you willing to pay per pound for beef if it was delivered to your home?

- $0.00
- $0.01- $0.35
- $0.36- $0.70
- $0.71- $1.05
- $1.06- $1.40
- >$1.40
- Prefer not to Answer

Appendix B. Consumer Study Validity Rubric

The objectives of this study:

1. Describe how and where Iowa consumers buy beef
2. Identify where Iowa consumers get their information regarding beef
3. Describe Iowa consumer preference for protein consumption
4. Determine if there is a relationship between where consumers get their information and their current habits when buying beef
5. Determine the priority of marketing topics for an extension program

As you are reviewing the questionnaire, please consider whether each item of the questionnaire is:

1. Relevant to the objectives
2. Clear and Concise
3. Not double-barreled
4. Free of technical jargon
Please examine each item of the questionnaire. Indicate on the questionnaire if the item should be:

1. Retained as is (Requires no mark)
2. Modified and retained (Make edits/ comments on the questionnaire itself)
3. Deleted (Mark through the item on the questionnaire)

Please review the questionnaire and evaluate it for **Content Validity**. The questionnaire is content valid if you believe that the items included in each section are a fair representation of what should be included in that section. After reviewing the questionnaire, please check the following.

____________________ The questionnaire is content valid.

____________________ The questionnaire will be content valid after making the changes I have recommended.

____________________ The questionnaire is not content valid for the following reasons:


Please review the questionnaire and evaluate it for **Face Validity**. The questionnaire is face valid if a typical respondent would agree that the items included on the questionnaire are consistent with the stated purpose of the study. There should be no subjective assessments from this questionnaire. After reviewing the questionnaire, please check the following.

____________________ The questionnaire is face valid.

____________________ The questionnaire will be face valid after making the changes I have recommended.

____________________ The questionnaire is not face valid for the following reasons:


Appendix C. Institutional Review Board Approval

Date: 08/20/2020
To: Sarah Smith
From: Office for Responsible Research
Title: BEEF PRODUCER PERCEPTIONS OF THE COMPATIBILITY AND COMPLEXITY OF EDUCATIONAL OUTCOMES AND DELIVERY METHODS FOR A VALUE-ADDED BEEF EXTENSION PROGRAM
IRB ID: 20-348
Submission Type: Initial Submission
Exemption Date: 08/20/2020

The project referenced above has been declared exempt from most requirements of the human subject protections regulations as described in 45 CFR 46.104 or 21 CFR 56.104 because it meets the following federal requirements for exemption:

2018 - 2 (I): Research that only includes interactions involving educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures, or observation of public behavior (including visual or auditory recording) when the information obtained is recorded by the investigator in such a manner that the identity of the human subjects cannot readily be ascertained, directly or through identifiers linked to the subjects.

The determination of exemption means that:

- You do not need to submit an application for continuing review. Instead, you will receive a request for a brief status update every three years. The status update is intended to verify that the study is still ongoing.
- You must carry out the research as described in the IRB application. Review by IRB staff is required prior to implementing modifications that may change the exempt status of the research. In general, review is required for any modifications to the research procedures (e.g., method of data collection, nature or scope of information to be collected, nature or duration of behavioral interventions, use of deception, etc.), any change in privacy or confidentiality protections, modifications that result in the inclusion of participants from vulnerable populations, removing plans for informing participants about the study, any change that may increase the risk or discomfort to participants, and/or any change such that the revised procedures do not fall into one or more of the regulatory exemption categories. The purpose of review is to determine if the project still meets the federal criteria for exemption.
- All changes to key personnel must receive prior approval.
CHAPTER 6. GENERAL CONCLUSIONS

This dissertation features three journal articles that provide key pieces of information to start building a new value-added beef Extension program. This chapter includes general conclusions and suggestions for further research and recommendations for practice.

The first paper (Chapter 3) described the challenges that beef producers currently face in regards to alternative production and marketing as well as identifying potential competencies for a new value-added beef Extension program. Experts in the field were able to come to consensus on items to address the two main objectives for the study. Findings from this study enabled the creation of a foundation of four modules for a potential value-added beef Extension program: (1) Business and Marketing; (2) Foundations of Value-added Production; (3) Foundations of Beef Production; and (4) Tools.

The second paper (Chapter 4) outlined the process for utilizing an instrument created to identify alignment for a new value-added beef Extension program. The newly created instrument enables program planners to identify needs from program participants to enable the personalization of the Extension program. To ensure personalization, the instrument measures the program objectives’ compatibility and complexity. It also asks participants about their delivery method preferences.

The purpose of the third paper (Chapter 5) was to explore and describe Iowa beef consumers’ habits and perceptions towards beef products. A survey was administered to beef consumers across the state of Iowa. Iowa consumers provided answers to questions that enabled researchers to have personalized information about the perceptions and buying actions, including: (a) the explanation of why or why not consumers buy from different locations such as grocery stores, farmer’s markets, etc.; (b) where they get their information from about beef
products, beef consumer preferences of protein buying; (c) the relationships between where individuals get their information and where they buy their beef, priorities of beef marketing topics; and (d) whether consumers are willing to pay more for different beef brands. The data provided abundant revelations regarding current Iowa consumer practices and what they desire regarding beef products.

The mission of Extension is to bridge the gap between research and the community through educational programming to enhance the overall community in a positive manner. Within the community different groups of individuals work together and have wants and needs. As shown in this dissertation, it is important to separate the wants and needs to ensure that you can address the needs of the community. Producers and consumers have a unique relationship as both of these groups have different individual goals but ultimately have a common goal within the overall social system. As literature has stated, consumers are wanting to learn more about the production and distribution of their food. Identifying the characteristics of Iowa consumers, it will allow Extension personnel to meet the needs of beef producers through educating them what their final market (consumers) are like and what they are demanding. Each group studied in this dissertation plays a critical role in the others’ overall success. When the characteristics of all the individual groups are understood, guidance can be provided to work together to achieve the adoption of a new innovation.

This dissertation focused on Iowa consumers and producers. The framework for the needs assessments described in this dissertation can be adapted to other states. Completing a needs assessment with multiple point of views, provides a well-rounded picture. The implications of this dissertation provides evidence that it is important to collect data to discover the needs of the population for the program that extension personnel will create.
The findings of the studies have raised new questions to guide further research endeavors:

1. What interest do beef producers have in the curriculum derived from the data collected from this dissertation?
2. What are the best ways of promoting the adoption of a new value-added beef Extension program?
3. Does the program align with the needs of the participants who participate in the Extension program?
4. How frequently do beef consumers buy from certain locations and consume certain proteins?
5. What sources of information about beef products do consumers trust the most and why?
6. What are the items that most impact consumers buying beef?