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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

Iowa beef operation sizes vary considerably, but the average herd size is about 42 cows. Thanks to competitive feed prices and improved production efficiencies compared to other regions, opportunities for value-added markets have increased over the last 15 years. These opportunities have had a positive economic impact on the farm, harvest operations, and the processing sector (Iowa Beef Center, 2017).

With increased opportunities for value-added practices, Iowa beef producers want 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). Current beef Extension programming at Iowa State University focuses on live animal production. Extension specialists offer such programs as feedlot short courses, pasture workshops, and beef quality-assurance training (Iowa State University Extension & Outreach, 2019). The last value-added beef Extension program for Iowa was created in 2001. As the industry changes in response to consumers, beef producers need up-to-date educational opportunities. Due to the lack of an up-to-date curriculum, a needs assessment study—the first step in the program development process—was essential. This information will allow Extension educators to understand what is currently happening in the industry and the needs for a new educational program. By identifying gaps in current Extension programming and gathering information about specific needs from industry representatives, Extension personnel will have valuable information as they start to develop new programming (McCawley, 2009).

THEORETICAL FRAMEWORK

The environment in which Extension specialists work focuses on the idea of change (Scott et al., 2018). Through informal education programming, Extension specialists educate the public on knowledge that has been learned through research. The new knowledge that specialists provide to the public can be described as innovations (Rogers, 2003).

This study focused on the innovation element of the diffusion of innovation theory, which can be defined as "an idea, practice or object that is perceived as new by an individual" (Rogers, 2003, p. 12). The current study sought to identify information needed to develop a new Extension program for beef producers. Through completing a needs assessment, Extension educators can identify the gaps and the needs for a new program. A *needs assessment* can be defined as a systematic method to identify the problem, need, or issue of a group (Caffarella & Ratcliff Daffron, 2013). The purpose of a needs assessment is not to solve the issue at hand but instead to gather information about the current needs in the industry. By identifying what is missing through a needs assessment, Extension educators can then create an innovation, or a new item, for individuals.

The success of program improvements due to the innovative process as well as the ability to translate new ideas into Extension programs strengthen the impact and value of the program (Meyer et al., 2018). Working with stakeholders or experts in the field ensures that 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.
2. Identify the competencies needed in a new value-added beef Extension program.

METHODS AND PROCEDURES

A modified Delphi study with three rounds was used (Hasson & Keeney, 2011) for the purpose of having a group of field experts come to consensus. According to Ludwig (1997), the Delphi technique 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, using 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 using this method, we were able to explore different ideas suitable for the creation of a new value-added beef Extension program. The study protocol was approved by the Iowa State University Institutional Review Board (IRB # 19–452).

PARTICIPANTS

Study participants included individuals who were in beef outreach education and producers with numerous years of beef production experience. As recommended by Ludwig (1997), a nomination process was followed to identify experts who had the knowledge and experience needed to provide the highest quality information. Two Extension personnel with a combined total of 38 years of experience nominated participants for the study. The nominating personnel followed the criterion that participants in the study be either beef education service providers or be involved in value-added beef practices for at least 20 years.

Forty-six participants were nominated for this study. Participants who completed this study included 17 males (68%) and 8 females (32%), with an average of 27.36 years of involvement in the beef industry. Participants' professions included faculty (five people, 20%), Extension specialists (seven people, 28%), industry education providers (four people, 16%), and beef producers (nine people, 36%). Participants were from north-central, central, and south-central areas of [state]. Participants who completed the questionnaire represented both sectors of the beef industry and different groups that provide beef education.

DATA COLLECTION

Guidelines for credibility, transferability, dependability, and confirmability were followed to ensure trustworthiness in the study as it related to the to the qualitative nature of the Delphi technique (Ary et al., 2010; Guba & Lincoln, 1994; Shento, 2004). To ensure that the instrument measured what it claimed to measure (face validity), two value-added beef and Extension education experts who did not participate in the study reviewed the two open-ended questions used in Round 1 to ensure that the wording could be understood by the participants. The instruments for Rounds 2 and 3 were also reviewed by three individuals involved in Extension at Iowa State University.

ROUND 1

The 46 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 instrument for Round 1. As recommended by Delbecq et al. (1975), participants were given 2 weeks to complete the instrument. We provided two email reminders during this round, following the communication guidelines established by Dillman et al. (2009). In addition, the participants were asked questions about their demographics.

ROUND 2

Items from Round 1 were gathered, summarized, and put into a list for Round 2's instrument (Hsu & Sandford, 2007). The list gathered from Round 1 included two parts: (a) challenges beef producers are facing and (b) potential competencies. In both parts of the instrument, participants were asked to use a 5-point Likert-type scale (1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree) to indicate their level of agreement with Round 1 items. The retention criterion was defined as at least 75% of participants answering "Agree" or "Strongly Agree." This retention criterion was similar to that of other studies (Jenkins & Kitchel, 2009; Ramsey & Edwards, 2011) in the field.

ROUND 3

The experts who participated in Rounds 1 and 2 were sent an email that included Round 3's instrument. This instrument included the competencies and challenges that were scored with either 4 (Agree) or 5 (Strongly Agree) by 75% of the participants in Round 2. In Round 3, participants were asked, "Is this competency/challenge important to be included in a value-added beef program?" Response options were "yes"

or "no." Consensus was determined at 90% agreement. This criterion was similar to that applied in a study by Easterly and Myers (2017).

DATA ANALYSIS

Qualtrics was used to analyze the data. Open-ended responses from Round 1 were analyzed via the constant comparison method (Ary et al., 2010). The responses were organized into different themes to create the instruments for Rounds 2 and 3. Data collected in these rounds were analyzed through descriptive statistics.

RESULTS

ROUND 1

In Round 1, 46 email invitations were sent to individuals who met our criteria to participate in the Delphi study. The response rate was 54.3%. The first question asked, "What challenges do beef producers face in regard to alternative production methods and marketing?" Experts listed 53 challenges, which were then 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, "What competencies should be included in a value-added beef Extension program on alternative production methods and marketing?" Experts listed 22 competencies, from which 31 items were identified to go into Round 2's instrument. The authors took the listed competencies provided and split statements up to yield specific and measurable competencies for an educational program. Competencies 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). After data collection for questions 1 and 2, the answers were analyzed to ensure there were no repeat questions and no double-barrel questions.

ROUND 2

In Round 2, participants were asked to rate their agreement with items generated from Round 1. If the item had 75% of the participants rate the item either "Agree" (4) or "Strongly Agree" (5), it achieved consensus and was put into Round 3's instrument. The 25 participants who completed Round 1 were invited to complete Round 2's survey. The response rate for Round 2 was 84%.

Out of the 53 challenges listed, 28 achieved consensus, and 21 (67.7%) competencies achieved consensus. All the categories of challenges and competencies resulting from Round 1 were represented in the items that achieved consensus in Round 2.

ROUND 3

In Round 3, 21 participants who completed Rounds 1 and 2 were surveyed; the response rate was 90.47%. Round 3's participants were asked to confirm whether 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 of 28 items achieved consensus (see Table 1). Items from the categories of "Beef Industry Structure," "Consumer," "Marketing," "Monetary," "Regulation and Labeling," and "Resources" were represented. The category "Other Protein Sources" was the only category of challenges not represented.

For the competencies, 9 of 19 items achieved consensus (see Table 2). Items from the categories of "Business and Marketing," "Foundations of Beef Production," "Foundations of Value-added Production," and "Tools" were represented. All categories created in Round 1 were represented in the items that were confirmed to be important in this round.

DISCUSSION

Producer challenges and competencies identified by experts do not align with current Extension programs that focus on traditional marketing and production. This study has provided new and valuable information for Extension personnel to use in creating an up-to-date value-added beef Extension programs.

Results from this study also 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, and so forth (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. 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.

Table 3 provides a framework for a new program that would be organized into modules, with competencies and selected challenges that could be addressed within the modules. Researchers translated the identified topics from participants into specific and measurable competencies. In addition, there are listed challenges that beef producers are facing today, as stated by the participants in this study. Having this information while creating an educational program would allow the educator to have background information on their program participants and potential questions or concerns that may come up.

Table 1. Challenges Achieving Final Consensus (*n* = 19)

Challenges	Category
1. Sector differentiation may lead to challenges when providing information on production practice verification for value-added labeling.	Beef Industry Structure
2. Consumer lack of knowledge on how their cattle are raised, priced, and prepared to cook different cuts of meat.	Consumer
3. Producers being able to find a consistent and profitable market that offers premiums for their product.	Marketing
4. Producers being able to have consistent availability of their product.	Marketing
5. 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.	Marketing
6. Producers having a place to market their product and supplying the markets.	Marketing
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).	Marketing
8. 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.	Monetary
9. With direct marketing programs, such as freezer beef, there are greater labor and input costs along with logistical challenges.	Monetary
10. Overall cost of production for specialized programs and branding of their products.	Monetary
11. Limited accessibility to USDA inspectors, limiting the ability to sell product out of state.	Regulation and Labeling
12. Ensuring food safety and compliance with USDA rules related to direct marketing.	Regulation and Labeling
13. Producers' availability of small federally inspected lockers.	Resource

Table 2. Competencies Achieving Final Consensus (*n* = 19)

Competencies	Category
1. Cost management of the operation.	Business and Marketing
2. Business planning, including details of products, time frames, and investment requirements.	Business and Marketing
3. Marketing and budgeting lessons that include break-even details.	Business and Marketing
4. Forage management strategies.	Foundations of Beef Production
5. Regulations regarding transportation of livestock and meat products.	Foundations of Beef Production
6. Labeling regulations and requirements for shipping across state lines.	Foundations of Value-Added Production
7. Details on shipping perishable value-added products to consumers.	Foundations of Value-Added Production
8. Recordkeeping tools and software to assist in tracking production costs.	Tools
9. Decision tools for cattle performance, economic/price outlook, etc.	Tools

CONCLUSIONS

Future research is recommended to determine whether beef producers would be interested in the items that were suggested by the experts. To determine the most effective way to promote adoption of the new program, ensuring that the compatibility and complexity of the competencies align with beef producers will be critical. Extension personnel in Iowa should create a curriculum based on the framework developed through this study to align experts' recommendations with beef producers' needs. Once the innovation of a value-added beef Extension program has been fully developed, a program evaluation protocol should be created to allow Extension personnel to determine whether objectives of the curriculum have been met.

The study was limited to one state, and the researchers do not recommend generalizing the results beyond Iowa. Although this research was conducted in Iowa, the frame-

Table 3. Framework for a New Value-Added Beef Extension Program

Module	Competencies	Challenges to consider addressing
1. Business and Marketing	1.1. Apply different business planning strategies to manage cost of the operation. 1.2. Recognize the details of a generic business plan for a beef operation. 1.3. Produce an example business plan for a beef operation. 1.4. Outline different business plans with specific time frames. 1.5. Analyze different investment requirements for your new or expanding business. 1.6. Summarize break-even details. 1.7. Identify beef marketing strategies. 1.8. Practice beef operation's budgeting. 1.9. Critique a break-even budget.	1.1 Finding a consistent and profitable market that offers premiums to the producer 1.2. Small segment of the market that will pay a premium to help cover additional expenses for value-added products 1.3. Having a place to market products 1.4. 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). 1.5. Sector differentiation may lead to challenges when providing information on production, practice, verification for value-added labeling. 1.6. Overall cost of production for specialized programs and branding 1.7. Consumer education on how cattle are raised, priced, and prepared to cook
2. Foundations of Value-Added Production	2.1. Explain the labeling regulation details of meat products. 2.2. Summarize the requirements for shipping products across state lines. 2.3. Describe the details on shipping perishable value-added products to consumers.	2.1. Availability of small federally inspected lockers limits ability to sell out of state 2.2 Logical challenges with direct marketing 2.3. Have consistent availability of their products 2.4. Ensuring food safety and compliance with USDA rules related to direct marketing.
3. Foundations of Beef Production	3.1. Summarize the basics of forage management strategies. 3.2. Compare and contrast forage management strategies. 3.3. Apply different forage management strategy plans. 3.4. Describe regulations regarding transportation (movement) of livestock.	3.1. Greater costs associated with most alternative production methods
4. Tools	4.1. Identify recordkeeping tools that are available to assist in tracking production costs. 4.2. Demonstrate the use of recordkeeping tools for tracking production costs with example records. 4.3. Recall the basic details of decision tools for cattle performance, economic/price outlook, etc. 4.4 Analyze cattle performance through using decision tools. 4.5 Interpret economic/price outlook through using decision tools.	N/A

work shows promise for application in other states that want to identify the needs for a new value-added beef Extension program. Even so, others may be able to apply some of the findings to other settings that they deem similar to those found in Iowa. In addition, the needs assessment process that was used should be widely applicable and could serve as a model for others.

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