

Agricultural Grading Manual Training Tools: An Evaluation

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Abstract

The United States Department of Agriculture (USDA) implements federal regulations and guidelines to ensure that the food supply is safe for consumers. The job roles for inspectors who work for USDA include in-plant inspections, lot sampling, and conducting audits in plants, on farms, and at entry ports. In order to efficiently complete each task, all inspectors must be thoroughly trained. This work examined current USDA applesauce grading manuals in order to evaluate and offer recommendations to improve the quality of the training materials that are used to train USDA inspectors. Utilizing an implementation evaluation, participants were given a questionnaire pertaining to the applesauce grading manual. The participants in the study determined that the overall applesauce grading manual was easy to navigate. However, some participants found the manual difficult to understand and needed some modifications. It was recommended that adding supplemental documents like color charts, and more specific measurements would make the manual more efficient. These changes could produce more efficient and confident inspectors.

Introduction

Apples were the most consumed fruit in America (“Agricultural Marketing Resource Center,” 2018). Varieties like Fuji, Honey Crisp, Golden Delicious, Rome, McIntosh are consumed fresh, processed, and/or juiced. Expansion in production, new apple variety, and an increase healthy lifestyle awareness all drive the consumption and popularity of apples. Prior to being consumed, the apples have to be inspected following standards and guidelines of the applicable federal agency. Federal laws give food manufacturers, distributors, and retailers some responsibility for assuring that foods are safe under sanitary conditions (Johnson, 2016). Other responsibility is given to the food inspectors employed by these agencies. Food inspectors are responsible for not only following, but also enforcing these standards and guidelines in order to complete the inspection. In order to do so efficiently and accurately, each inspector has to be properly trained.

Background

Founded in 1862 by President Abraham Lincoln, the United States Department of Agriculture (USDA) is comprised of 29 different agencies across America. From food safety to soil conservation, USDA provides various public goods and services. Their purpose to provide leadership on food, agriculture, natural resources, rural development, nutrition, and related issues based on public policy, the best available science, and effective management (“About USDA,” n.d.).

One of the agencies or branches under USDA is the Agricultural Marketing Services (AMS) Specialty Crops Division. AMS administers programs that create domestic and international marketing opportunities for U.S. producers of food, fiber, and specialty crops

(“About AMS,” n.d.). This branch employs numerous inspectors across America to inspect not only food products, but also commodities or goods like cotton and tobacco. There have been manuals produced for over 300 different types of commodities, referenced in appendix A (“The United States Government Manual 1984/85,” 1984).

Inspector’s duties can range from in-plant inspections, lot sampling, and conducting audits in plants, on farms, and entry ports. During inspection inspectors look for things like defects in products, salinity levels, net weights, acid levels, mold, and inedible objects that do not belong. In order to efficiently and effectively complete the tasks, agricultural inspectors have to complete various types of trainings. Training can include attending classes, workshops, shadowing other inspectors, and reviewing grading manuals for food quality. The type and extensiveness of training depends upon on what division an inspector works in and the type of inspector a person is. For example, for the fruits and vegetables division there are processed food inspectors and fresh food inspectors. Each has a different training associated with the job. Fresh inspectors have to attend a specific set of training and be certified in a specific commodity before they can begin inspecting that commodity. The expectations for training of processed foods inspectors are different. They are trained by shadowing current inspectors, hand-on experience, and referencing all manuals applicable throughout their tenure as an inspector. Utilizing on the job training and grading manuals, training is a continuous process throughout an agricultural inspector’s career.

Statement of Problem

Training is an integral component of a USDA Agricultural Commodity Grader’s job role. To efficiently and effectively inspect commodities, the inspector has to be trained on each commodity and grading that commodity. The two primary components of the USDA

Agricultural Commodity Grader's training are the Administrative, Inspection and Management Systems Instruction (AIM) Manuals and commodity grading manuals. The purpose of both the AIM Manuals and grading manuals is to provide background information and guidelines to assist with the uniformity and overall performance of the inspector's daily duties and inspections ("AIM General Procedures Manual," n.d.). Whether it's the supervisors, auditors, and/or inspectors, both are used by all as the first reference given before any other training materials or shadowing experience. The grading manuals were implemented as early as the 1940's and while some have not been updated consistently, other have not been updated at all since they were first introduced. The manuals are also inconsistently written and presented as training tools, making it difficult for any inspector to be able to pick up and begin learning the steps for inspecting that crop or food product. Grading manuals should be written and updated in a way so that a newly hired inspector is able to pick it up easily and follow the instructions step by step without question.

This project focuses on the *USDA applesauce grading manual*. The applesauce grading manual was selected manual because it has been inconsistently updated. The factors and requirements USDA inspectors use when determining if applesauce is grade A or B is currently all text and has not been updated since 2005. This manual gives USDA inspectors guidelines on how to grade applesauce based on USDA's specifications. Figure 1 displays some of the specifications and requirements inspectors must follow when grading applesauce. Each inspector is introduced to the grading manual prior grading this commodity in the lab or in the field. How the inspectors are introduced and trained using the manual may vary. This variance could affect

how the inspector interprets the manual and grade the commodity. In order to effectively inspect a commodity, the training has to match the training material, and training has to be consistent.

Factors	Grade A	Grade B
COLOR:		
Natural:	Bright, practically uniform, typical of variety or varieties used, no discoloration due to oxidation or scorching.	Dull, reasonably uniform, typical of variety or varieties used. Slightly brown, slightly pink, or slightly grey.
Spice flavored:	Characteristic of the color imparted by added spice, free from discoloration due to oxidation or scorching.	The color imparted by added spice may be slightly affected by pink or grey color, but is not off color.
Artificially colored:	Bright and distinct.	Reasonably bright and distinct.
SCORE POINTS:	18 - 20	16 - 17
CONSISTENCY:		
Product flow:	Not more than 6.5 cm (2.5 in)	Not more than 8.5 cm (3.3 in)
Free liquid:	Not more than 0.7 cm (0.3 in)	Not more than 1 cm (0.4 in)
SCORE POINTS:	18 - 20	16 - 17
ABSENCE OF DEFECTS:		
Dark stem:	Not more than 3	Not more than 5
Seed particles, discolored apple particles, carpel tissue:	Not more than 0.5 cm ² (0.08 in ²) Total but,	Not more than 1.0 cm ² (0.16 in ²) Total but
Medium and dark colored particles	Not more than 0.25 cm ² (0.04 in ²)	Not more than 0.5 cm ² (0.08 in ²)

Figure 1. USDA Applesauce Grading Factors

Purpose of Project and Objectives

The purpose of this project is to evaluate and identify potential modifications of current USDA Applesauce Grading manuals in order to update and improve the quality of the training materials that is used to train USDA inspectors.

Project Objectives

- Identify potential modifications needed in the USDA Applesauce grading manuals.
- Provide recommendations on how to make manuals more user friendly for all food inspectors.

Research Questions

1. How can the applesauce grading manual be modified to improve the training of USDA inspectors?

2. What are the perceptions of professionals involved in implementing the USDA applesauce grading manual related to implementation of the manual?
3. What suggestions do participants have for the USDA applesauce grading manual?

Review of Literature

Training is defined as the activity of learning and/or teaching skills and knowledge needed for a particular job or activity, is an integral and continuous process in most organizations (Milhem et. al, 2014). “Training helps people to learn how to be more effective at work by modifying knowledge, skills, or attitudes through learning experience to achieve effective performance” (Otuko et. al, 2013). Professionals train to not only learn the basics of their profession, but to progress in their field. This literature review will evaluate literature on procedures and manuals used in daily operations, to determine the effectiveness of procedure manuals.

Benefits of Training

In order to continue the process of instilling knowledge into the employees, researchers are studying the perceived benefits of training. Training employees has the potential to increase worker productivity, encouragement, and decrease employee turnover (Hassan et al., 2013). In both the United States and Canada, researchers determined that as organizations continue to integrate training during the employee’s tenure at an organization, the relationship between the organization, training, and overall job satisfaction becomes more prominent (Schmidt, 2007). Employees who participate in training are more committed to the organization (Bartlett, 2001).

Training in many organizations is even being utilize for many other reasons outside of personnel growth. In some cases, organizations today are utilizing training to gain some sort of leverage over their competitors (Brum, 2007). Training is an essential component of an

organization. By studying training, organizations could use this information to improve both the training itself, and the methods used. The overall results of these studies show that with adequate training employee retention, job performance, and overall satisfaction could increase.

Forms of Training

There are various forms of training and tools used to assist with employee training. Standard Operating Procedures (SOP's) are one tool used for training. SOP's are a set of instructions written by an organization used to carry out daily operations. Using SOPs ensures that daily tasks completed by the employees are being completed in a standardized and concise manner. Utilizing and being familiar with the information in SOPs brings awareness to those who use them. (Hattemer-Apostel. 2001).

Another form of training used is team training. Team training is a major component in fields where teamwork is important like the medical field (Salas et. al, 2008). Team training is a form of training used to not only improve the group's performance, but also individual's performance ("National Academies Press," 1994). Using the team training teamSTEPPS (Team Strategies & Tools to Enhance Performance & Patient Safety) curriculum for a hospital staff helped the staff reduce hospital related falls by 13% (Spiva, n.d.). USDA utilizes team training in order to train multiple offices on grading one commodity. Some organizations are also incorporating role playing- training as a training method. This method enables trainees to play out a specific role in order to learn a certain skill. Education settings implement role playing to help students learn specific skills and counselor training is conducted using role playing to help counselors respond to various needs of clients (Nikendei et. al., 2005; Xu et. al, 2016).

Focus on USDA Inspectors

Evaluating this type of training tool is one of the few ways researchers could study its effectiveness. The studies above provide some insight on how using manuals and other techniques could potentially have an impact on employees in various occupations. The focus of this study is on USDA Inspectors and how they perceive the training manuals for implementation of their work. USDA uses various methods to train their inspectors, like those listed in the literature provided. One of the major methods used for training are the USDA grading manuals. The United States Department of Agriculture's (USDA) AMS Specialty Crops AIM Manuals are implemented as self-instructed guides and serve as training resources for all employees. There is limited literature about the effectiveness of the manuals and information on the evaluation the manuals as a training tool. The goal of this work is to evaluate the training manual as a tool using multiple stakeholders who must adhere to the USDA guidelines for fruits and vegetables.

Theoretical Framework

This work will be framed using Cervero and Wilson's theory of program planning. This challenges past program planning theories that only focused on the program's outcomes, by integrating political and ethical aspects of program planning. The theory of program planning includes not only those who plan the program, but the stakeholders who are also affected by the program. To be optimally useful, planning theories must both account for what actually happens when people plan educational programs and also provide a guide to practical action (Cervero and Wilson, 2006). Understanding that stakeholders who plan the program also affect those who implement the program, creates a more useful program.

The program planning theory introduces the idea of a planning table. The planning table is both a physical and metaphorical table, in which people meet and make decisions of an educational program (Cervero and Wilson, 2006). The table is comprised of four components which Cervero and Wilson identifies as the dimensions of the planning table. These dimensions are power, interest, negotiation and responsibility. Understanding all four dimensions and connecting them will enable educators to include all possible stakeholders affected by the program.

In this study, the processed fruits and vegetable division of USDA is the overall program and training for current and new employees is what is being planned. In order to create, implement, and update employee training, those who are responsible for training need to understand what works and what doesn't work with current commodity grading. In order to that, trainers should understand all whom are affect by being a properly trained USDA inspector. These stakeholders include but not limited to USDA applicants (food processors), policy makers, agricultural inspectors and supervisors, and consumers.

Interest

“Those involved in planning education programs exercise their power in accordance with their own specific interest and the interest of others they represent at the table” (Cervero and Wilson, 2006).

Interest according to the dictionary is defined as a feeling that arouses special attention to something or someone (Merriam-Webster, n.d.). Those with interest in a particular thing or in this case a program plants a vital role in planning a program. In order to plan a program, there

has to an interest or a want for it. There has to an interest by all the stakeholders involved in order for the program to reach its goals (See Figure 2).

Figure #2. Display those stakeholders who may have interest when it comes to developing training and actually training USDA inspectors. For example, USDA applicants want adequately trained inspectors, because that means that their product is being graded appropriately and efficient. The consumers want product that is safe to consume. When planning training, these are the stakeholders who should be considered.

Stakeholders with Interest	Why are they Interested?
Consumers	They are the ones who consume the product graded by USDA. They want safe and good quality product for consumption
USDA	Looking for ways to improve USDA inspection
Commodity Procurement	They are award the bid and contracts
USDA Applicant	Their product is being graded by USDA.
Standardization Branch	They create and update the manuals used by inspectors for inspection

Figure 2. Stakeholders with Interest

Power

Power is not something that one possesses. When used with this theory, power is having the capacity to act. When planning a program those with power have the ability to say or make certain decisions that other stakeholders cannot in the appropriate setting. The same applies when it comes to planning and implementing USDA inspector training. It would not be up to the USDA applicant to make decisions on inspector training. Even though they have a huge interest in how the inspectors get trained, their power comes into play when acting on what to do with the product once it is graded. The power to act or making decision for planning inspector training

relies on the supervisors, and those in the national office who create the tools used for training (See Figure 3). Figure 3. displays the stakeholders with power, and in what capacity in which they can act.

Stakeholders with power	What do they oversee? (Regulate?)
USDA National Office	All decisions pertaining to all USDA offices
USDA commodity procurement	Offer and award USDA Bids and Contracts to USDA Applicants who are in good Standing
USDA Applicants	They decide on which contract to bid on. USDA Applicant chose when to produce product, and determine what to do with that product if it does not meet USDA standards
USDA Supervisors	Training new and current USDA inspectors, and enforces USDA standards to USDA applicants.
USDA Inspector	USDA Inspectors determines the grade of product being graded by USDA standards.

Figure 3. Stakeholders with power chart

Responsibility

Program planners have to decide who should be at the planning table. They have to determine whose interest should be the primary focus of the program. In order to do so, program planners have to look at which each stakeholder is responsible for, or their ethical commitment. By examining the stakeholder's responsibilities, the planner can see how the stakeholder's roles will affect the overall goal of the program planning. With training the applicant in the end benefits from a well-trained inspector, but their role would not benefit planning inspector training. This should involve the inspectors who are being trained, and the supervisors who were once trained and do the training (See Figure 4.).

Stakeholders who are responsible	What are they Responsible for?
USDA Supervisors	responsible for training new inspectors, and making sure that inspectors are grading and certifying based on USDA standards
USDA Inspectors	responsible for adequately and efficiently applying the grading manual while grading applesauce
Commodity Procurement	Responsible for deciding which manufacturer across the country gets the contract awards
USDA Applicant	Responsible for training their staff, determining which apples to use, and producing Grade A/ Grade B product. Responsible for keeping up to date with USDA's current grading standards and regulations

Figure 4. Ethical Commitment (Responsibility) Stakeholders

Negotiation

Negotiation is an activity in which, people are communicating back and forth until they can reach an agreement. At the planning table, stakeholders are communication/ negotiating in order to determine what to do when planning a program. The figure below displays what is being negotiated, and when negotiation happens (See Figure 5.).

Stakeholders that will negotiate	What is being negotiated?
USDA Supervisors	Negotiate with the national office of what should be incorporated in their office, and what should be included with training
USDA Applicant	can negotiate with USDA if they want to refute a grade (USDA can retest the product only if it was sampled from the warehouse and not on- line)
USDA Inspectors	<ul style="list-style-type: none"> The trainer has to inform the new inspector to not grade based on their experience at another plant that produces the same product. They have to treat the plant and grading as if they have never been to that particular plant

Figure 5. Negotiation & Stakeholders

Cervero and Wilson's program planning theory building upon the idea the program planning is a social activity that should incorporate all social, ethical, and political dimensions. According to this theory, looking at the overall "bigger picture" can be more beneficial than just considering the purpose, and outcome of the program. When planning, implementing, and updating employee training, those who are responsible for training need to understand what works and what doesn't work with current commodity grading. In order to that, trainers should have an understanding of all whom is affected by being a properly trained USDA inspector.

Methodology

To address the research questions, an implementation evaluation has been selected using a qualitative case study design with USDA food inspectors who grade and evaluate applesauce as the participants. Implementation evaluation is conducted to determine if a program has been implemented as it was intended to be (Mertens, 2012). In order to determine if the USDA grading manuals serves its purpose and assists in training, current USDA inspectors were asked to participate to provide feedback on the manual as it relates to its' content, ability to be used by a new inspector to evaluate apple sauce, and seek to understand what modifications, if any, they would suggest.

An implementation evaluation was selected because there is no existing data on whether or not the manuals are effective found in the literature. Implementation evaluation allowed the participants to identify the strengths and weaknesses of the grading manual, assess the appropriateness of the manual under changing conditions, and determine if the manual provided is adequate to train other applesauce graders (Mertens, 2012). Gathering detailed information about what the grading manuals are providing can help provide evidence to the USDA and AMS

to gauge what the experience of training is like for an inspector and can tell decision makers what is happening with the training manuals or what adaptations inspectors make when they are in the field grading any commodity (Patton, 2002).

The applesauce grading manual was evaluated using a questionnaire. By evaluating the grading manual, it can be determined if the current manuals are adequate to teach a new inspector how to grade applesauce. New USDA inspectors are first introduced to the grading manuals when they are hired and begin training and these are used from that point on in their career. USDA inspectors often work independently they should be able to reference the appropriate manual, and efficiently perform the assigned task.

Recruitment

Three participants were recruited to participate in this study. Each participant was asked if they would review the current applesauce grading manuals to determine if they felt as though they achieved the goal of enabling a new inspector to grade applesauce independently. The participants were targeted because they are current USDA employees, with varying years of experience. All three had experience inspecting and grading applesauce in various settings.

Participants

The participants of this evaluation were all current USDA inspectors and use all grading manuals including the applesauce grading manual on a daily basis. They were able to provide adequate feedback on what does and does not work with the current USDA applesauce grading manual. Requirements for employment as an inspector require a bachelor's degree, which the participant possesses. Participant one had over 10 years of food inspection experience.

Participant two has been with USDA for two years and was previously employed as a Quality Assurance (QA) inspector in a USDA certified manufacturing plant. Participant three is a USDA inspector, with one year of experience. Each participant was able to provide a different perspective on the grading manual based on their experience and longevity in the field.

Procedures/Process

After agreeing to participate, the participants were provided with the direct link to the grading manual and a question list that they filled out on a computer and return via email. Each participant was provided 14-21 days to respond with two reminders sent via email. The participants were given the same questionnaires regarding their overall perception of the manual. However, participant one and participant two had additional questions that addressed their experience as a lead inspector/trainer and quality assurance technician respectively.

The participants read the USDA applesauce grading manual and inspection instructions. Once the manual was reviewed, the questionnaire (Appendix B) was completed. The questions given to the participants were divided into different subsections (general feedback on the manual, differences in inspector's results, introduction to the manual, and recommendation). The results from the participants were analyze, compiled, and organized into each of the subgroups. Based on the findings and participant recommendations, additional recommendations were made. Responses to the questions are found in Appendix D.

Findings

Each participant was asked to review the current applesauce grading manuals to determine if they felt as though they achieved the goal of enabling a new inspector to grade applesauce

independently. The questionnaire (appendix B) that all three participants received asked questions based on their level of experience with USDA. All questionnaires had questions that pertained to the readability, and ease of use, and recommended changes for the applesauce grading instruction manual. Depending on their current and/or prior position within USDA, the participants may have had to answer an additional question. Figure 8. displays the overall responses from the participants.

Participants	Usability of the grading manual (General Feedback)	What should be removed/added to the manual? (Recommendation)	During your training period how was the grading manual used part of the training?
Participant One	The manual is not difficult to understand and lays out detailed explanations on the different quality requirements. Self-Explanatory.	Nothing should be omitted from the manual. A brix minimum & maximum should be added to the manual	Introduced to the manual during training period. Was instructed to read the manual to gain an understanding of the content
Participant Two	The manual is not difficult to understand, when you are familiar with the grading tools. It maps out the applesauce grading process from start to finish.	Nothing should be omitted from the manual. Procedures if apple sauce is neither Grade A or Grade B should be added to the manual.	N/A
Participant Three	“I see that sometimes the grading manual is not specific when it comes to grading in certain steps.” The manual is difficult to understand and leaves certain grading decisions to the inspector’s discernment	All The information provided is essential to the grading process. The manual should come with a figure of each step to illustrate the grading process and the manual should provide a clear colored image of acceptable and not acceptable samples related to color	Introduced to the manual right before inspection. “I remember it was used to introduce the basic rules of the grading process.”

Figure 8. Participant feedback from the questionnaire

General feedback on the manual

All three participants had positive feedback of the overall applesauce grading manual. They all found the manual to be easy to navigate through. It was determined that the manual gave adequate step by step instructions that laid out how to grade applesauce from start to finish.

Additional Feedback

Even though all participants found the manual easy enough to navigate, there were differences in the responses among the participants. Participant one and two agreed that the manual was self-explanatory. However, participant two felt that the manual worked perfectly as it currently stands. They stated that nothing should be omitted from the manual as is. Participant three disagreed with both, “I think the manual is difficult to understand and follow when it generalizes the grading steps and leave certain grading decision to the inspector discernment.”

The responses of the participants reflected how each inspector were trained utilizing the grading manual. Their level of understanding of the manual depended on how they were introduced to the manual. Participant one was trained by their supervisor and was instructed the read the entire manual to gain an understanding. Participant three was given the manual and basic instructions on how to grade applesauce. With no detailed training and prior experience before being hired with USDA, participant three found that it was more difficult to understand.

Recommendations

Recommendations from Participants

Participant	Recommendations for the Manual
Participant One	<ul style="list-style-type: none">•The manual has not been updated in 15 years, and needs basic updates•Incorporate a Brix minimum (unsweetened applesauce) and Brix Maximum (sweetened applesauce)•Provide a breakdown on consistency score points and instructions how to provide a grade based on the score point
Participant Two	<ul style="list-style-type: none">•Include all supplemental documents that the manual references within the manual•Include procedure if product does not meet requires for Grade A or Grade B applesauce
Participant Three	<ul style="list-style-type: none">•Include figures that illustrates the steps of the grading process•Include colored images that provide a clear picture of Grade A versus Grade B colored sauce.

Figure 9. Participant's Recommendations

All of the participants offered recommendations (Figure 9.) to make the manual more effective as a training tool. Participant one suggested that the grading manual needs a general updating. The manual has not been updated since 2005 and updating the manual would make this more consistent for all inspectors. More specifically, this participant recommended that “there should be a brix minimum and maximum for unsweetened and sweetened sauce.” Brix is defined as the number of dissolved solids (sugar) in an aqueous solution (Merriam- Webster, n.d.). For USDA the minimum level for unsweetened applesauce is 9.0 degrees. Anything below 9.0 degrees not only fails USDA specifications, but also cannot be classified as applesauce according to FDA. Currently, there are is no maximum limit for unsweetened, but there is a minimum for sweetened applesauce (15.5 degrees). The difference between unsweetened applesauce and sweetened is the addition of sugar. However, if the apples used during production have a high

sugar content like gala or fuji, the brix level will also be elevated. If a sample has a brix level of 15.6, but no sugar was added, this could make the inspector question if the sample is truly unsweetened. Having a set maximum and minimum level for both sweetened and unsweetened will enable the inspector to make a more definitive classification.

Participant two recommended that a set of procedures be added to the manual if apple sauce is neither Grade A nor Grade B. There are times when the apple sauce does not necessarily meet the requirements for either Grade A nor Grade B, and the inspector has to refer to their supervisor in order to make a decision. If the applesauce is borderline between Grade A and B; or goes beyond Grade B, the inspector should know what to do by just referencing the grading manual. There are other times when the manual suggests that the inspector reference a supplemental document for guidance, but the document is not attached. Participant two recommends that all referenced supplemental documents should be included with the manual at the end of the document.

Participant three who felt that the manual was difficult to understand offered numerous recommendations. The first recommendation was to make the manual itself more specific:

“I see that sometimes the grading manual is not specific when it comes to grading in certain steps. For example, the grading manual states there is not more than a slight amount of free liquid present.”

Free liquid is the juice of the apples that separates from the applesauce and pools around the edge of the applesauce when testing for consistency. Another recommendation was to provide an illustration/figure for each grading step, and visuals of grade A and grade B product. The illustration will give a detailed visualization of how to perform each step. In regard to training,

this participant suggested that the manual should be in video form, that new inspector will watch prior to grading product.

Grading qualifications of products should be clear and concise. Scoring should not differentiate based on the inspector's interpretation. Grading requirements should be more specific, and reference guides should be added to correspond to the applicable grading factor. Reference guides include but not limited to picture guides for Grade A and B sauce for each score factor, and video aids. These recommendations are some of the ways that the grading manual could be improved from the inspector's perspective.

Recommendation for Practice

Based on the participants recommendations additional recommendations were made on how to improve not only the applesauce grading manual, but the overall training for inspectors. It is recommended that all inspectors should be introduced to training materials (grading manuals) in a standardized way. This will ensure that all inspectors are being trained in a concise way. All inspectors should not only read and understand all applicable grading manuals, but also all other training materials. All trainers, supervisors, and or lead inspectors should make sure when appropriate that new and current inspectors should have a clear understanding of the grading manual. In order to implement that, there should be some revisions to the grading manuals.

When updating and planning training those with that power should consider involving the inspectors in the decision making. They have insight on what works when it comes to training, and what needs improvement. With the grading manuals, the inspectors utilize them on a daily basis. They will be able to tell those with power which manuals are easily readable, and which needs to be more concise. Having their perspective not only improves training and the training materials, but also has the potential to improve inspector efficiency,

Recommendation for Future Research

This study is limited to the singular viewpoint of the agricultural commodity graders (inspectors) who are employed by the processed fruits and vegetables division of the Agricultural Marketing Service (AMS). In order to be optimally useful for all of USDA, future researchers could study the perspectives from the inspectors in other branches under AMS. Also, researchers should study the perspectives of the supervisors. USDA supervisors are the trainers of the inspectors. They implement all applicable training, rules, and regulations within USDA. The supervisors are also the direct link between inspectors and the National office who is responsible for the manuals and regulations of USDA. They have the ability to negotiate with the National office and express what should and should not be implemented when it comes to training.

Discussion & Conclusion

For this project an implementation evaluation was conducted to determine if a program has been implemented as it was intended to be (Mertens, 2012). It allowed the participants to identify the strengths and weaknesses of the grading manual, assess the appropriateness of the manual under changing conditions, and determine if the manual provided is adequate to train other applesauce graders (Mertens, 2012). The participants not only provided some positive feedback on the usability of the manual, but also provided some constructive recommendations on how to improve the manual for new and current inspectors.

Based around Cervero and Wilson's Program Planning Theory, this study took into account inspector training and the stakeholders affected by their training. Understanding that stakeholders who plan the program also affect those who implement the program can create a more useful program. None of the participants had been asked for feedback, leaving them out of the conversation and without power to negotiate. The stakeholders affected by inspector training

include but not limited to, USDA supervisors, USDA inspectors, USDA manufacturers, and the consumers. By studying the participant's recommendation, those with power (i.e. National Office & supervisors) could potentially take the recommendations into account and implement the suggestions as appropriate. These changes could produce more efficient and confident inspectors. As a result, both USDA manufacturers and consumer will benefit by having adequately graded product.

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Appendices

Appendix A. List of Agricultural Commodities Graded by USDA

- Beef
- Cotton
- Dairy
- Eggs
- Fish & Seafood
- Flowers and plant
- Fruits (Fresh & Processed)
- Goat
- Grain
- Lam
- Nuts
- Organic
- Pork
- Poultry
- Rabbits
- Rice & Pulses
- Specialty Products (Arrowroot, Cactus leaves, lotus Root, Breadfruit, Ginseng, etc.)
- Tobacco
- Vegetables (Fresh & Processed)
- Wool & Mohair
- Imports (Dates, Raisins, Olives)

Appendix B. Questions

Questions for USDA Employees (Inspectors & Supervisors)

1. In your opinion, in what ways is the grading manual easy to follow?
2. In your opinion, in what ways is the grading manual difficult to understand?
3. In your opinion, in what ways is the grading manual difficult to follow?
4. What suggestions would you give to update the manual?
5. What, if anything, should be removed from the manual?
6. What, if anything, should be added to the manual?
7. What information can be provided to support the recommended changes?
8. During your training period how was the grading standard used as a part of your training?
9. How do you expect your inspectors to utilize the grading manuals after training?
10. In what way do you utilize the grading manuals when working with new and current USDA inspectors?

Questions for Quality Assurance Technicians

1. In your opinion, could any plant personnel from different departments read the applesauce manual and go grade applesauce without issue?
2. In your opinion, in what ways is the grading manual easy to follow?
3. In your opinion, in what ways is the grading manual difficult to understand?
4. In your opinion, in what ways is the grading manual difficult to follow?
5. What suggestions would you give to update the manual?
6. What, if anything, should be removed from the manual?
7. What, if anything, should be added to the manual?

8. What information can be provided to support the recommended changes?

Appendix D. Participant Responses Participant one

1. The grading manual lays out the different assigned grade requirements. It also gives detail explanations on different quality requirements (i.e. color, flavor, etc.)
2. I don't think that the grading manual is difficult to understand.
3. I don't think the grading manual is difficult to follow. In my opinion, it's pretty self-explanatory.
4. The suggestions I would give is to give a breakdown on the consistency and assigning score points and just update it in general because the last time it was written or revised was 15 years ago. I would also suggest that there is a brix minimum for unsweetened applesauce (9.0 degrees) but there is no maximum and then the sweetened minimum is 15.5 degrees. So I think that there should be a brix minimum and maximum for unsweetened and sweetened sauce.
5. Nothing should be removed from the manual.
6. Please refer to my response for question 4.
7. The manual has not been updated in the last 15 years. Each inspector has their own interpretation of the manual, and grading should be consistent.
8. During my training period, it was introduced to me and then I was told to read it and get an understanding for myself
9. I expect inspectors to utilize the grading manual as a reference and a guide into learning what to look for and how to find what they have questions about.

10. I use them as a reference and as a training guide that gives me directives as I explain what the USDA describe as good color and all the other factors.

Participant two

1. Yes, the applesauce manual is easy to understand. It clearly states the procedures of grading apple sauce from beginning to end.
2. The manual is easy to follow in the way that it is very straight forward and to the point.
3. I don't believe the manual is difficult to understand at all if you are familiar with grading tools.
4. I don't believe the manual is difficult to follow, it maps out the process of grading apple sauce from sampling to determining consistency.
5. One thing that could be beneficial if all referenced material was included at the end of the manual.
6. I don't believe anything can be omitted from the manual as is.
7. One thing that should be added to the manual would be procedures if apple sauce is neither Grade A or Grade B.

Participant three

1. I think the easy part for me to follow was the suggested order of grading a sample unit and it explains the grading process gradually.
2. I see that sometimes the grading manual is not specific when it comes to grading in certain steps for example this statement is from the grading manual "there is not more

than a slight amount of free liquid present.” It would be more helpful if the manual were more specific when it comes to measurement.

3. I think the manual is difficult to understand and follow when it generalizes the grading steps and leave certain grading decision to the inspector discernment.
4. I think if we can turn in this manual into a video explain the grading process.
5. I believe all the information this manual provide is essential to the grading process.
6. I highly suggest that if the manual comes with a figure of each step to illustrate the grading process and the manual should provide a clear colored images of acceptable and not acceptable samples related to color and finish if possible that will help the inspector to differentiate between them and help ease the grading process.
7. N/A
8. I remember it was used to introduce the basic rules of the grading process.