Field to table: A brief 4-H agricultural literacy program for middle school students

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Field to table: A brief 4-H agricultural literacy program for middle school students

by

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MASTER OF SCIENCE

Major: Agricultural Education
(Agricultural Extension Education)

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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 creative component. The Graduate College will ensure this creative component is globally accessible and will not permit alterations after a degree is conferred.

Iowa State University
Ames, Iowa

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Abstract

The origin of food is an important topic for youth to understand. With the shift in livelihoods away from farming, many youth do not fully comprehend the concept of “field-to-table.” Many teachers lack the resources and knowledge to teach their students about this topic. To address this problem, in particular in schools that do not have an agricultural education program, outside agencies such as Extension 4-H could intervene and provide programs that educate youth about agriculture and how it affects their lives. Such programs are often termed “agricultural literacy.” A program presented in the schools by an outside professional, such as from Extension 4-H, could be beneficial to both students and teachers. The program developed herein aims to educate youth about where their food came from, presented a modern view of a farm and farmer, and intends to inspire youth to research careers in agriculture. This creative component used the Iowa State University Extension 4-H Equation to form objectives to foster positive youth development in participants. The 4-H Equation consists of three categories: youth needs, essential elements, and program priorities. These elements combined to produce positive outcomes. The curriculum outlined in this creative component includes a lesson plan for a presentation, a guided discussion, a laboratory activity, and an evaluation.
Introduction

Field-to-table is a term that has become common in recent years when talking about youth nutrition and understanding of agriculture (Boleman & Burrell, 2003; Hess & Trexler, 2011; Knobloch, Ball, & Allen, 2007; Nordstrom, Wilson, Kelsey, Maretzki, & Pitts, 2000). The term is associated with the broader concept of agricultural literacy, which preceded it (Hess & Trexler, 2011). Over the last two hundred years, the understanding of food has become more foreign to youth. Historically, greater numbers of youth lived in rural areas and were very involved in producing their food, compared with today (Henry, 2015). Many either worked on their family’s farm or a nearby farm. With the urbanization of many regions of the United States (U.S.), families left the rural lifestyle for lives in urban and suburban areas.

Along with the decline of rural livelihoods, families became separated from situations that would have allowed them to teach children where their food came from and why agriculture was essential to their lives. However, today’s youth have some knowledge of food, and it is in some ways, complex. For example, they understand that their food comes from farms (Hess & Trexler, 2011). Hess and Trexler (2011) found that 4-6th-grade students from Long Beach, California, understood that farms were involved in producing food, but their ideas were “underdeveloped or contradictory to expert conceptions” (p. 151). The children tended to hold misconceptions and misunderstood details about modern agriculture and industry (Hess & Trexler, 2011).

Bolman and Burrell (2003) state that misconceptions and misunderstandings have contributed to the public questioning agriculture practices, including animal well-being, environmental impact, and the safety of the food supply. A study conducted by Nordstrom and colleagues (2000) found that elementary and middle school youth were left out in learning about
agriculture. They recommended that more work needed to be done by 4-H professionals to implement programs promoting agriculture in schools. Teachers expressed that when students understood the role of agriculture in their lives, they developed a respect for nutrition, agriculture’s role in society, and the environment. Programs that taught youth about agriculture also prepared them to be more able to make important decisions about the fate of agriculture when they are older (Hess & Trexler, 2011).

**Purpose**

The purpose of this original program developed as part of the creative component is to offer a view of the contemporary world of U.S. agriculture to 8-9th-grade youth. The program is titles, “Agriculture in Your Life.” By offering a modern view of people, activities, machines, and landscapes youth will gain knowledge and new perspectives of agriculture. This program will enable the students to critique their ideas about the concept of a farmer, potential careers in agriculture, and farms. Middle school is a time when youth begin deciding which careers they are interested in. Dorph and colleagues (2018) found in a study conducted on middle school students of all genders in California and Pennsylvania that youth who participate in STEM activities throughout their schooling can have a higher interest in similar careers. Agriculture in Your Life is designed to introduce the concept of modern agriculture to middle school youth to interest them in agricultural careers.

**Location**

The program will be delivered in a school setting as part of the regular day, during a session of science, health, family development, or other class where the curriculum is appropriate. School is a valued place to deliver this program because it gives students who are not involved in extra-curricular activities like 4-H the opportunity to gain knowledge they would
not otherwise be exposed to. Rollins et al. (1992) noted that bringing programs into schools through outside agencies can cause them to be more effective than if the school itself presented the program.

Audience

The audience for this program is middle school students attending schools in urban and suburban areas. The concept of agriculture can be skewed for such youth because they do not see aspects of the industry in their everyday lives (Holz-Clause & Jost, 1995). Many school districts located in urban areas do not offer agriculture science classes, so youth are not exposed to agriculture throughout their time in school (Smith, Park, & Sutton, 2009). Youth perception of agriculture can be attributed to what they have seen on television or read in books. Holz-Clause and Jost (1995) conducted a study comparing perceptions of agriculture by youth in 6– 8th grades in four urban areas and three rural areas in Iowa. They found that when asked “what came to mind when the word farmer was said,” the participants said, “a man, dressed in overalls, smelling dirty, and chewing on a straw” (para. 1). This image is outdated, male, and negative.

Many youth know that agriculture is essential, but they are not aware of the many ways agriculture affects their lives (Holz-Clause & Jost, 1995). When teaching agriculture to youth, it is crucial to tie agriculture to youth interests, educate early, and measure the results of the program (Holz-Clause & Jost, 1995).

Middle school is an appropriate time to introduce possible careers in agriculture to youth because they are starting to develop interests in certain fields (Dorph, Bathgate, Schunn, & Cannady, 2018). Dorph and colleagues (2018), found that “early learning experiences should be designed to support the development of science interest and career awareness” (p. 1036) to
encourage youth to pursue STEM careers. Agriculture in Your Life presents the concept of agricultural careers to youth at this opportune decision making time.

**4-H Educators**

Ideally, 4-H educators will present the program. Teachers agree with the idea that learning about agriculture is important. However, many teachers do not feel that they are well versed enough in the topic to adequately teach their students about agriculture (Humphry, Stewart, & Linhardt, 1994). They do not have adequate materials for teaching the subject effectively (Knobloch et al., 2007). When teachers feel they are not adequately informed on a subject, they are less likely to teach that subject in their classrooms (Humphry et al., 1994).

**Positive Youth Development**

4-H programs and presentations cannot be solely about science or other topics. They must also be designed to encourage child social and emotional development, now termed “positive youth development,” which is an abstract, often complicated process that occurs in youth that forms them into productive adults (Caldwell & Witt, 2018). Positive youth development is associated with a concept known as “thriving.” When youth thrive, they are engaged in an activity that utilizes their talents, interests, or future aspirations (Caldwell & Witt, 2018). When 4-H programs are created with thriving in mind, youth who participate in these high-quality 4-H programs have a higher chance of fostering positive youth development (Arnold, 2018).

There are multiple tools and models to help youth development professionals design and implement programs to serve both thriving and positive youth development principles. One of these models is the Iowa State University Extension and Outreach 4-H Equation (Iowa State University Extension and Outreach, n.d.). The 4-H Equation (Figure 1) is a model used to create 4-H programs and activities that foster positive youth development. The 4-H Equation seeks to
empower youth through “youth-adult partnerships and research-based programs and experiences” (Iowa State University Extension and Outreach, n.d.). The model consists of three categories: youth needs, essential elements, and program priorities, that combine to produce positive outcomes (Iowa State University Extension and Outreach, n.d.).

Agriculture in Your Life was designed with the 4-H Equation as a base. The Agriculture in Your Life Program addresses several youth needs. Belonging is encouraged by enabling students to connect to each other by promoting group discussion and use of the flip chart to retain their ideas. This is inclusive and not competitive. This will allow participants to see that their ideas of what agriculture are may be respected as much as their peers’ ideas. The information presented will pertain to their everyday lives and show them how agriculture is involved in their lives, including how their ideas of what modern agriculture is could differ from more common portraits of agriculture.

Figure 1. 4-H Equation (Iowa State University Extension and Outreach, n.d.) graphic showing four areas: youth needs, essential elements, program priorities, and outcomes.
Literature Review

Multiple programs have been implemented that investigate the concept of field-to-table in the broad area of agricultural literacy. The Wisconsin Nutritional Education Program FoodWise (Williams, 2016) is presented in schools and afterschool programs such as the Boys and Girls Club to help families and individuals with limited incomes to shop for and cook healthy meals by providing nutrition education. This program is presented by county Extension offices in Wisconsin and funded through federal organizations like the Supplemental Nutrition Assistance Program-Education (SNAP-Ed) and the Expanded Food and Nutrition Education Program (EFNEP) (Williams, 2016). Williams reports that one part of the effectiveness of the FoodWise program is that nutrition Extension professionals who live in the community present the program. She claims that presenters are aware of the culture of the community and can cater their program to make the most impact on the participants.

An example of a program created by 4-H professionals is Agriculture Every Day (Hayslett & Powell, 2019). This resource is a curriculum created by Iowa State University Extension and Outreach 4-H youth specialists Hayslett and Powell (2019). The curriculum was created to help educators teach youth about agriculture and how it affects their lives (Hayslett & Powell, 2019). This free publication includes hands-on activities and twelve short lessons that show participants how agriculture is present in their lives (Hayslett & Powell, 2019). Agriculture Every Day was created for teachers to use as a resource in their classroom to teach about agricultural topics focusing on STEM.

Some agricultural literacy programs utilize technology to teach youth about agriculture. FarmChat® is a program that utilizes video chat technology to bring classrooms to farms (Iowa Agriculture Literacy Foundation, 2018). According to Iowa Agriculture Literacy Foundation, the
program gives students who might not ever get the chance to see a farm, get up close to animals and other aspects of farms, all while staying in the comfort of their classrooms (Iowa Agriculture Literacy Foundation, 2018). When programs are brought into classrooms to teach about agriculture, youth who do not live in close proximity to agriculture industries get the chance to experience farming through STEM.

Schools have resources they can take advantage of to start field-to-school programs through the National Farm to School Network (2019). The Network has options for how to implement agriculture in schools. The website outlines resources such as the Farm to School Network, a resource database, a link to the USDA Farm to School website, and a link to state school nutrition associations (National Farm to School Network, 2019). One drawback of this resource is that schools need to allocate teachers’ time and school funds to establish and implement the program.

**Gender in Agriculture**

Agriculture in Your Life differs from the program and resources listed above because it includes aspects that address gender and processing in agriculture. The program shows students that people all genders work in agriculture.

Bieri Buschor, Berweger, Keck Frei, and Kappler (2014) performed a study in Zurich, Switzerland which showed that women who choose careers in STEM were more involved in learning experiences and had supportive parent and role models. Agriculture in Your Life offers a learning experience which has the ability to spark interest in agricultural careers in female students.
Learning Objectives

The learning objectives of Agriculture in Your Life combine to teach participants that agriculture affects their everyday lives and that modern farmers may not be what they believe them to be. The learning objectives are as follows:

Youth Needs: Belonging

- Youth will feel comfortable talking independently about and sharing what they learned with friends and family.

Essential Elements: Engaged Learning, Providing Opportunities to Plan for the Future and an Inclusive Setting

- Youth will analyze how their food is produced when consuming or buying food throughout their lives.
- Youth will recognize that farmers are contemporary people of all genders.
- Youth will express interest in the field of agriculture as a source of employment.

Outcomes: STEM

- Youth will infer that agriculture crops are present in all of the food we eat.
- Youth will critique how their perception of the modern farm may differ from reality.

Instruction

Youth learn well when they can interact and inquire into the material rather than just be instructed (Knoblach et al., 2007). The learning objectives listed above are achieved through a (a) presentation and (b) discussions with flip chart. Table 1 lists these aspects of the curriculum, the objective they address, and suggests an instructional approach to achieve that objective.
Outcomes

Youth needs, essential elements, and program priorities, according to the 4-H Equation, add up to produce outcomes that foster positive youth development. The categories for the programmatic outcomes for this program are healthy living and STEM (Iowa State University Extension and Outreach, n.d.). Understanding modern agriculture and where food comes from has the ability to promote a healthy lifestyle by encouraging youth to recognize agriculture in their lives and understand that agricultural crops are in the food we eat. Agriculture in Your Life promotes STEM because it has the ability to inspire participants to research future careers in agriculture after learning about the modern farmer during the program.

There are several outcomes that Agriculture in Your Life will provide to participants. These outcomes are organized into short-term, intermediate, and long-term outcomes. The short-term outcomes are:

- Youth infer that their idea of what a modern farm consists of could be incorrect.
- Youth recognize that agriculture crops are processed to create products that come in different forms and are used in many different foods.

These short-term outcomes will be evident directly after the program has concluded.

Intermediate outcomes are outcomes that can be observed after short-term outcomes and are less directly connected to the program. The intermediate outcomes for this program are:

- Youth recognize that farmers are contemporary people of any gender.
- Youth recall what they learned and share the information with their peers and family.
- Youth recognize the importance of agriculture and how it influences their lives.
• Youth apply knowledge gained by recognizing agriculture in their community in the form of farmers markets, produce sections, and more.

The last category of outcomes is long-term. These outcomes are concepts that are the least connected to the program because they occur long after the program is concluded. The long-term outcomes are:

• Youth across genders investigate careers or college majors in the field of agriculture.

• Youth identify how food at the grocery store or restaurant was produced.

The outcomes listed above are instrumental in fulfilling the categories of programmatic outcomes of healthy living and STEM.

Table 1
Aspects of Curriculum, the Objectives they Address, and the Suggested Instructional Approach

<table>
<thead>
<tr>
<th>Feature</th>
<th>Objective</th>
<th>Instruction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Presentation</td>
<td>Students will critique how their ideas of the modern farm may differ from more common occurrences on farms</td>
<td>Provide participants with examples of past and modern farms</td>
</tr>
<tr>
<td></td>
<td>Students will recognize that farmers are contemporary people of all genders</td>
<td>Supply examples of modern farmers, including their way of life, gender, and education level.</td>
</tr>
<tr>
<td></td>
<td>Students will feel comfortable talking independently about and sharing what they learned about modern agriculture to others</td>
<td>Provide accurate, age-appropriate, and interesting information</td>
</tr>
<tr>
<td></td>
<td>Students will become interested in the field of agriculture</td>
<td>Show participants that farmers are contemporary people of all genders and agriculture is also found in urban areas</td>
</tr>
<tr>
<td>Activity</td>
<td>Students will analyze how food is produced when</td>
<td>Reveal how corn products are manufactured</td>
</tr>
</tbody>
</table>
### Lesson Plan and Program

Agriculture in Your Life was designed by 4-H, to be presented to 8-9th-grade students, during school hours in classes such as health, biology, environmental science, family development, or any other class where the program could enhance the curriculum.

### Lesson Plan

The overall goals of Agriculture in Your Life are to teach participants that agriculture affects their everyday lives, the modern farmer may not be what they believe them to be, and to interest youth in future careers in agriculture. These goals are met through achieving several outcomes, creating an environment where participants feel like they belong, and meeting essential elements that are outlined in the 4-H equation. The program addresses several essential elements. These essential elements are providing opportunities for engaged learning, providing

<table>
<thead>
<tr>
<th><strong>Consuming or Buying Food Throughout Their Lives</strong></th>
<th><strong>Demonstrate that corn can be processed into many different food products that may not look like a cob of corn</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Students will infer that agriculture crops are in all the food we eat</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Discussion</strong></th>
<th><strong>Facilitate class discussion about common misconceptions, opinions, and stereotypes.</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Students will critique how their ideas of the modern farm may differ from more common occurrences on farms</td>
<td></td>
</tr>
<tr>
<td>Students will feel comfortable talking independently about and sharing what they learned about modern agriculture to others</td>
<td>Provide accurate, age-appropriate and interesting information</td>
</tr>
<tr>
<td></td>
<td>Encourage students to share their ideas and what they have learned with others</td>
</tr>
</tbody>
</table>
participants opportunities to plan for the future, and providing an inclusive setting. Table 2 lists these essential elements and how they are met through the program.

The lesson plan found in Appendix B outlines the goals, outcomes, and dialogue of the program. The lesson plan utilizes discussion techniques such as allowing participants to record their ideas on to a flip board at the front of the room and not allowing negative language to be used about other participants’ ideas to provide an inclusive environment.

Table 2
Essential Elements of Agriculture in Your Life

<table>
<thead>
<tr>
<th>Essential Element</th>
<th>How it is Addressed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Opportunities for Engaged Learning</td>
<td>Encourage participants in learning actively by allowing them to record their answers to questions on the flip board</td>
</tr>
<tr>
<td></td>
<td>The Corn Investigations activity utilizes experiential learning to keep youth interested and engaged</td>
</tr>
<tr>
<td>Opportunities to Plan for the Future</td>
<td>Illustrate to participants what modern agriculture is and how it will affect their lives</td>
</tr>
<tr>
<td>Inclusive Setting</td>
<td>Encourage participants in learning actively by allowing them to record their answers to questions on the flip board</td>
</tr>
</tbody>
</table>

Program Implementation

The program consists of a presentation, discussions, and an activity. The platform used to present the lecture is Microsoft PowerPoint. To help facilitate discussion, a flip chart should be set up at the front of the classroom for participants to record their ideas about what they believe agriculture to be and how it is present in their lives. Participants are encouraged to participate when the presenter gives an example of an answer to the question. They are also encouraged to provide an answer when the presenter makes sure no answers that are written on the flip chart are scrutinized.

During the presentation, youth will participate in an activity entitled Corn Investigation. Using activities and experiences can enhance learning. Depending on the amount of inquiry, this can be called experiential learning. In experiential learning, youth are encouraged to learn
through experience and asking questions, as opposed to learning only through reading or listening to lecture (Kolb, 2015). Corn Investigation is an adapted activity based on Koch et al. (2008). The activity was modified for my program to better fit my goals. This Farm to Table and Beyond curriculum contains activities, homework, and lectures. The modified Corn Investigation is in Appendix C.

**Evaluation**

Evaluation is an important aspect of program planning and implementation to monitor the extent to which programs are effective and outcomes are met (Caffarella & Daffron, 2013). Establishing successful programs is important for program planners, participants, and other stakeholders (Ary, Cheser Jacobs, & Sorensen, 2010). I created a brief survey for the program. The statements within the survey are aimed to gauge the program’s impacts on students’ ideas about agriculture and agricultural careers before and after participating in the presentation. The survey asked three questions in before/now pairs consistent with the retrospective post style regarding (a) contemporary farms, (b) agriculture crop processing, and (c) agricultural careers. A five-point scale was provided in a table as a box. I considered the three questions to be simple enough to be understood by middle school students and short enough to fit into the time constraints of the program. A survey asking retrospective questions instead of pre and post-tests can help alleviate the possibility that participants will leave aspects of the survey blank. The survey will be administered by the program presenter. The data collected will be analyzed by the presenter. Permission may need to be obtained from the school, parents, and youth depending on how the data are to be used. The evaluation materials can be found in Appendix D.
Reflection and Future Directions

Growing up in a small, rural community taught me to value agriculture and the important role it played in the lives of everyone. Moving to a large city to complete my undergraduate degree at the University of Minnesota- Twin Cities taught me that not all youth were as fortunate and were not exposed to agriculture. The idea for this creative component came to me while I worked as a nanny, which was a position that I held with a family for over four years. One of the young children mentioned that she did not like to eat animals. However, she made this remark while sitting at the dinner table, enjoying a steak. I mentioned to her that steak actually was once a cow, and she was stunned. She knew it was “meat” but did not realize that the steak she was enjoying was once an animal. From that moment on, I decided that I would consciously mention agriculture to the children and broaden their knowledge of the industry. This incident helped me to plan a way to share agriculture with urban youth.

Planning the creative component proved to be a challenge for me. I have never had to come up with an original idea and implement it at a graduate level. Once I finally decided that I would create a curriculum, I did not know where to start because I had never created a program from scratch before. I knew I wanted the program to be offered through 4-H because I was involved in that program when I was younger and believe that their frameworks and ways of educating were effective. My course work which I completed throughout my master’s degree program at Iowa State University, helped me to create this program; specifically, AGEDS 524 Program Development and Evaluation in Agricultural and Extension Education, and YTH 520 Community Youth Development. Both helped me with this program. I also believe that my bachelor’s degree in Plant Science from the University of Minnesota- Twin Cities helped me to
ensure the content information presented in the program was correct and helped me to communicate to participants using simple terminology.

The hardest component of this project was creating goals and objectives that were both obtainable and worthwhile. When thinking of possible goals, I found it challenging to make goals that were not too broad but were also not so specific. I believe that my final choices allow for participants to learn something through the program as well as meet the essential elements of 4-H.

Choosing to build this program around the idea that it will likely be presented by 4-H professionals was an easy decision for me. 4-H was a pillar of my childhood, and I feel that 4-H is an effective avenue for teaching youth lessons. My future career goals include 4-H. I am hoping to become a youth development educator or a 4-H program coordinator. The classes I took throughout my master’s degree have prepared me for this career. I look forward to using this presentation in my future work to educate youth about how agriculture affects their lives.

Agriculture in Your Life has the ability to help teachers to meet the middle school Next Generation Science Standards for growth, development, and reproduction of organisms. The program introduces the concepts of feeding the population through using biotechnology and using crops in many ways in the Corn Investigations activity. The standard states that middle school youth should be able to “gather and synthesize information about technologies that have changed the way humans influence the inheritance of desire traits in organisms (Next Generation Science Standards, 2013).” The program demonstrates to participants that agriculture has changed over time to feed the growing population using biotechnology to achieve desired traits in agricultural crops. In the future, the program could be expanded to include more in depth
discussion about specific agricultural careers in biotechnology, genetics, agronomy, or horticulture.

**Conclusions**

The goals of this presentation are important because many of today’s youth do not entirely understand how their food is produced. Presenting a program in schools is convenient for youth as well as educators. The presentation outlined in this paper can be used by 4-H professionals to help to ensure that youth of today understand modern agriculture and how food is produced as well as interest youth in agricultural careers. The use of discussion and activities has the potential to keep youth interested in the presentation. It and allows them to gain new knowledge and attitudes that they can keep with them and share with their friends and family after the presentation has concluded. The idea of field-to-table is as important today as it was many years ago when the average family was a farm family.
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Appendix A: Presentation
Agriculture in Your Life

Where does food come from?
What is Agriculture?

- Animals
- Crops
- Transportation

What is Agriculture?

- Animals
- Crops
- Transportation

Corn Investigations

- Made from the endosperm
- Made by grinding endosperm into a fine powder
- Corn Oil, Corn Flour, Corn Meal, Corn Syrup

Corn Investigations

- Made from the endosperm
- Made by grinding endosperm into a fine powder
- Corn Oil, Corn Flour, Corn Meal, Corn Syrup
What does a farm look like?

Today’s Farm vs. The Farms of Yesterday
Machinery

Farmer Working the Field

Modern Day Combine Harvester

Modern Day Milking Parlour

Feeding the Population

Harvesting Wheat by Hand

Harvesting Corn using a Combine Harvester
What does a Farmer Look Like?

Male Farmer in Last Century’s Corn Field

Female Farmer in a Field of Kale

Female Farmers

Number of Female Farmers in the United States in 1997 and 2002


Female Principal Operators, by Sales Class, 2007 and 2012
(number of operators and percent)

<table>
<thead>
<tr>
<th>Annual Sales</th>
<th>2007</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than $10,000</td>
<td>219,168</td>
<td>218,046</td>
</tr>
<tr>
<td>$10,000 to $49,999</td>
<td>42,553</td>
<td>44,373</td>
</tr>
<tr>
<td>$50,000 to $99,999</td>
<td>9,111</td>
<td>9,953</td>
</tr>
<tr>
<td>$100,000+</td>
<td>15,377</td>
<td>15,802</td>
</tr>
<tr>
<td>Total</td>
<td>296,209</td>
<td>288,264</td>
</tr>
</tbody>
</table>


*Statistically significant change.

Number of Female Farmers in the United States in 2007 and 2012

http://www.nass.usda.gov/Publications/2012/05/11/Farms-by-Owner-0511.pdf
Thank You!
Appendix B: Lesson Plan
Agriculture in Your Life Presentation

Estimated Time: 40-50 minutes  
Age Range: 8\textsuperscript{th} - 9\textsuperscript{th} Grade Students

Program Capacity: 10-40 Students

Overall Learning Goals

The overall learning goals of this program are to inform participants that agriculture affects their everyday lives, the modern farmer may not be what they believe them to be, and to interest participants in future careers in agriculture.

Learning Objectives

By the end of this program participants will:
1. Analyze how their food is produced when consuming or buying food throughout their lives
2. Infer that agriculture crops are present in all of the food we eat
3. Critique how their ideas of the modern farm may differ from more common occurrences on farms
4. Recognize that farmers are contemporary people of all genders
5. Feel comfortable talking independently about and sharing what they learned about modern agriculture with others
6. Express interest in the field of agriculture as a source of employment

Presentation

Section 1: What is Agriculture?

This section of the program aims to introduce participants to the concept of agriculture. Participants will have the opportunity to reflect on how agriculture is currently present in their lives by encouraging them to participate in the discussion. This encouragement addresses youth needs through promoting the feeling that youth belong in the discussion about agriculture. Creating a space where youth feel safe to share their ideas and included addresses the aspect of essential elements in the 4-H Equation.

1. Set up a flip chart in the front of the room
2. Begin presentation by welcoming participants by introducing yourself and explaining that the overall goal of the program is to educate them about modern agriculture
3. After transitioning to the next slide ask participants where they believe their food comes from
   a. Have students take turns writing their answers on the flip chart
   b. Encourage youth to participate by first giving an example answer and ensuring all of their answers are written on the flip chart and are not scrutinized
   c. Some possible answers to this question include: grocery store, farmers market, gardens, food pantries, or restaurants
4. The next slide will focus on different aspects of agriculture
   a. Begin by introducing the different aspects of agriculture: animals, crops, and transportation
   b. Discuss different examples of each aspect and ask the class to give other examples
      i. Examples of animal agriculture are: dairy cows, beef cows, sheep, pigs, or goats
      ii. Examples of crops are: soybeans, wheat, vegetables, or fruits
      iii. Examples of transportation are: getting food to stores, shipping animals to be processed, or taking goods to factories

Section 2: Corn Investigations Activity

This section of the program consists of an activity aimed to show participants that agricultural products are all around them, and even though a product may not look like a fruit or vegetable it could contain them. This activity encourages youth to share their ideas and think critically about agriculture. It also has the potential to show youth that aspects of agriculture are all around them every day. This activity promotes STEM which is one of the program priorities.


1. Materials needed for activity include: paper cups, cornstarch, hand wipes, the two page “Corn Investigations” handout found in Appendix C, and six cobs of corn with the kernels still attached
2. Speak with the class teacher before the presentation and ask them to split the class into five (5) equally sized groups
3. Split the class into the groups the teacher assigned before the presentation and ask them to choose a group leader
   a. The group leader will retrieve the group’s cup of cornstarch, hand wipes, and cob of corn as well as serve as answer recorder for the group
4. Take out a cob of corn and show it to the class
   a. Use a dry cob with about half of the kernels removed
   b. Ask the class to look at their cob of corn
   c. Encourage participants to remove one of the kernels of corn and examine it
5. Tell the groups to examine their handout (Appendix C) and their cornstarch
   a. Encourage participants to feel the cornstarch
   b. Ask what part of the corn kernel they think is used to create their product and why
      i. Use the handout and touching the cornstarch for ideas
   c. Ask what could be done to a kernel to make it like corn starch
      i. Have participants think about if corn starch is similar to any other products. This can help to think about how corn starch is made.
   d. Ask if there are any other products participants can think of that are made using corn but do not look like a kernel of corn
6. Advance the Corn Investigations slide (Appendix A), to reveal the answers to the above questions

Section 3: The Modern Farm

This section of the presentation will focus on the modern farm. It will give participants the opportunity to voice what they believe the modern farm and farmer to be. The presentation will then move on to provide participants with new images of the modern farm. Giving youth the opportunity to express their opinions in a safe inclusive environment addresses youth needs and essential elements.

1. **Ask** participants what they think a farm, the farmer, and the general operation of a farm look like
   a. Have students take turns writing their answers on the flip chart
   b. Encourage participants to answer by ensuring they understand that there is no wrong answer. Discourage put down phrases.
   c. Some possible answers include: red barn, cows, tractors, male farmer with straw hat
2. The next portion of the presentation will consist of multiple slide comparing and contrasting modern farms with the farms of yesterday. When addressing these differences, tie them back into the answers participants gave to the last question.
   a. Machinery
      i. Inform participants that the farmers of yesterday had to rely on horses and performing tasks such as milking animals by hand and today’s farmers can rely on complete automation with tractors, combines, planters, and automatic milkers
   b. Feeding the Population
      i. Explain that in 1940 one farmer could only feed 19 people with the food they grew in one growing season, but today farmers can grow enough food to feed 155 people in that same time frame
      ii. Segue into the next slide by mentioning that farmers of today can grow more food due to automation and biotechnology
   c. What does a Farmer Look Like?
      i. Explain that the farmer of yesterday was usually the male head of the family, or patriarch, who spent the entirety of his day in the field or with the animals, raised many products with many of them going back to help feed his family, and relied on past knowledge that has been passed down to him for many years to take care of his farm
      ii. Describe the role of women in agriculture of yesterday as usually taking care of the garden, small animals, cooking and cleaning, which were not automated (hand wringer for washing clothes or wooden butter churn)
      iii. Reveal that the farmer of today has usually gone to college to educate themselves on technologies and business practices, learn about new technologies, produces products that are sold to be used by other people, and can be any gender
1. Show visual of the 2012 census there were almost 300,000 female farmers who owned their own farming operation (USDA NASS, 2018)

3. **Discuss** with participants how their view of the modern farm may have changed due to this data

4. End the presentation by thanking the participants for their attention, mentioning the goal of the presentation again, and asking participants if they have any questions

5. Pass out evaluation materials
   a. Inform participants that all responses are confidential and they should not put their name on the survey.
Corn Investigations Activity

This activity examines cornstarch.

Directions
- Split into (5) groups
- Send someone up for materials
- Appoint someone to take data

Materials
- Cup of Cornstarch
- Hand Wipes
- “Corn Kernel” Handout
- Dried Corn Cob with Kernels Still Attached (one for each group)

Answer the following questions
- What part of the corn kernel is used to create cornstarch? Why?
  - Use the handout and touch the cornstarch for ideas.
- What could be done to a kernel to make it like cornstarch?
- Are there any other products you can think of that are made using corn?

Corn Kernel

The seed coat is mostly fiber and protects the kernel.

The air cavity is the space between the seed coat and the endosperm.

The endosperm is mostly starch. It provides food for the young corn plant.

The germ contains most of the oil found in a corn kernel. When the kernel is planted, the germ develops into a corn plant.

DID YOU KNOW . . . ?

A corn kernel is
- 16% water
- 4% oil
- 20% fiber and protein
- 60% starch
Appendix D: Evaluation Resources
Agriculture in Your Life Survey

The following statements ask about agriculture and careers in agriculture. Please indicate whether you strongly agree, agree, are undecided, disagree, or strongly disagree with the statements. All responses will be kept confidential.

<table>
<thead>
<tr>
<th></th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Undecided</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before the presentation I was familiar with modern agriculture.</td>
<td></td>
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<tr>
<td>Now, my idea of agriculture has changed.</td>
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<tr>
<td>Before the presentation I knew corn was processed to make other products.</td>
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<tr>
<td>Now, I know that corn is processed to make other products.</td>
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<tr>
<td>Before the presentation I was interested in a career in agriculture.</td>
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<tr>
<td>Now, I am interested in careers in agriculture.</td>
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Appendix E: Program Logic Model
**Agriculture in Your Life Logic Model**

Agriculture is an important part of today’s society because it provides humans with food, but many youth do not know the impact agriculture has on them. This is because many youth are not exposed to agriculture in their everyday lives and do not have any reason to know where their food comes from. This program aims to inform youth about modern agriculture using an educational presentation and activity. The program will be presented in urban schools by 4-H professionals.

- **Inputs**
  - 4-H Presenter
  - Funds for Supplies
  - Supplies
  - Presentation Materials
  - Permission from School and Teacher

- **Activities**
  - PowerPoint Lecture and Flip Chart discussion
  - Corn Investigations Activity

- **Outputs**
  - Middle school youth aged 8th-9th grades

- **Participation**

- **Short-Term Outcomes**
  - Youth infer that their idea of what a modern farm consists of could be incorrect

- **Intermediate Outcomes**
  - Youth recognize that agriculture crops are processed to create products that come in different forms and are used in many different foods
  - Youth recognize the importance of agriculture and how it influences their lives
  - Youth apply knowledge gained by recognizing agriculture in their community in the form of farmers markets, produce sections and more

- **Long-Term Outcomes**
  - Youth recall what they learned and share the information with their peers and family
  - Youth identify how food at the grocery store or restaurant was produced
  - Youth across genders investigate careers or college majors in the field of agriculture

- **Assumptions**
  - School administrators and teachers allow program to be presented
  - Presenter is able to manage the classroom

- **External Factors**
  - There is no district wide event that would stop the program from being presented
  - Class attendance is low due to no interest on the part of students