## FOOD AND AGRICULTURAL EDUCATION IN MICHIGAN ELEMENTARY SCHOOLS: TEACHER INTEREST IN, AWARENESS OF, AND USE OF RESOURCES

By

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## A THESIS

Submitted to Michigan State University in partial fulfillment of the requirements for the degree of

Community Sustainability – Master of Science

### ABSTRACT

## FOOD AND AGRICULTURAL EDUCATION IN MICHIGAN ELEMENTARY SCHOOLS: TEACHER INTEREST IN, AWARENESS OF, AND USE OF RESOURCES

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Most youth consume inadequate amounts of fruits and vegetables, increasing their risk for diet-related diseases. At the same time, many youth lack an understanding of the relationships between their food, agriculture, the environment, society, and their health. An understanding of these relationships has the potential to enable youth to make healthy food choices and participate in a food system that benefits communities, the environment, and economies. Schools are ideal settings for food and agricultural education, but it is not required in most classrooms. In addition, barriers such as a lack of time and resources prevent the incorporation of non-required education.

To assess teacher interests in food and agricultural education and resource needs, a statewide, online survey of Michigan kindergarten through sixth grade teachers was conducted in 2015, with 1,196 respondents. The survey asked teachers about their interest in food and agricultural topics, subject incorporation, interest in resources, and awareness of existing resources. Analysis suggests that teachers were most interested in the topics of school gardens, organic food and farming, and youth entrepreneurial opportunities. There was also a surprising amount of interest in incorporating these topics into English language arts, where they are currently not common. Respondents indicated that it was very important that resources have no fee to use and are handson. The majority, however, were not aware of key existing resources, which suggests that outreach efforts could be strengthened. Providing resources shaped by the interests of teachers may help to expand the incorporation of food and agricultural education in Michigan classrooms.

#### ACKNOWLEDGEMENTS

This thesis would not have been possible without the support of many people. First, I would like to thank my advisor, Dr. Phil Howard, for his continual guidance, support, and patience throughout the development of my thesis and graduate studies. I would also like to thank my graduate committee, Dr. Katherine Alaimo and Dr. Mike Everett, for the support and critical feedback they provided.

I would like to express my gratitude to Michigan State University's Center for Regional Food Systems and the Michigan Good Food Charter team, for providing me the opportunity and assistance that allowed me to work on this research. I would especially like to thank Liz Gensler and Dr. Jude Barry for their invaluable support, patience, and encouragement. Also, to the teachers and educators who provided insight and feedback during the development of the research, thank you for your time and support.

Lastly, I am immeasurably grateful to my family and friends. I cannot thank my parents enough, who have always been there for me throughout my many endeavors, and my sister, who has been an important influence in my life.

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## **CHAPTER 1. INTRODUCTION**

## Background

Most youth consume inadequate amounts of fruits and vegetables, increasing their risk for diet-related diseases (Centers for Disease Control and Prevention, 2014; Kim et al., 2014; U.S. Department of Health and Human Services, 2008). At the same time, many youth lack an understanding of the relationships between their food, agriculture, the environment, society, and their health. An understanding of these relationships has the potential to enable youth to participate in their food systems as informed consumers, capable of making healthy food choices that are supportive of a food system that benefits communities, the environment, and economies (Bagdonis, Hinrichs, & Schafft, 2009; Briggs, Fleischhacker, & Mueller, 2010; Freeland-Graves & Nitzke, 2013; Joshi, Azuma, & Feenstra, 2008; Joshi & Ratcliffe, 2012; Story, Kaphingst, Robinson-O'Brien, & Glanz, 2008). Schools are ideal settings for food and agricultural education. Over 95% of youth from kindergarten through twelfth grade attend a public or private school, and many students consume at least one major meal at school, thus providing opportunities for food and nutrition learning and engagement (ASCD, 2014; Story, Kaphingst, & French, 2006).

Food and agricultural education is not required in most classrooms. Barriers such as time, adequate materials, and budgets prevent the incorporation of education that is not part of the core curriculum (Diker, Walters, Cunningham-Sabo, & Baker, 2011; Graham & Zidenberg-Cherr, 2005; Hammerschmidt, Tackett, Golzynski, & Golzynski, 2011; Jaeschke, Schumacher, Cullen, & Mardell, 2012; Jones & Zidenberg-Cherr, 2014; Knobloch, Ball, & Allen, 2007; Shumacher, Fuhrman, & Duncan, 2012; Trexler & Johnson, 2000). Overcoming these barriers can help expand food and agricultural education in classrooms and meet goal six of the Michigan Good Food Charter, which states that "Michigan schools will incorporate food and agriculture into the pre-K through 12<sup>th</sup> grade curriculum for all Michigan students and youth will have access to food and agriculture entrepreneurial opportunities" (Colasanti et al., 2010, p. 2).

The Michigan Good Food Charter presents a roadmap to move Michigan's food and agricultural system towards a good food system that is rooted in communities and provides healthy, fair, affordable, and green food to its residents. It presents six goals to achieve or surpass by 2020, and 25 policy priorities that provide strategic steps to achieve these goals (Colasanti et al., 2010).

Work on the Michigan Good Food Charter began in 2009 through the leadership of Michigan State University's Center for Regional Food Systems, the Food Bank Council of Michigan, and the Michigan Food Policy Council. Foundational funding came from the W.K. Kellogg Foundation. Work groups were formed to examine Michigan's current situation and provide recommendations to advance good food in five areas: youth engagement and opportunity, good food access, institutional food purchasing, farm viability, and food system infrastructure. In February 2010, a summit was held to discuss recommendations and gather feedback, comments and input; the Michigan Good Food Charter was released in June 2010 (Colasanti et al., 2010). Table 1 provides a list of the Charter's six goals. As of October 2016, over 800 individuals and institutions signed the Charter, including 24 signatures from school districts, school food services, or education associations (Michigan Good Food, 2016).

Two agenda priorities specifically focus on youth to achieve goal six of the Charter. Agenda priority 9 focuses on youth opportunity and entrepreneurship and agenda priority

11 focuses on good food education in the school curriculum. Providing students with education and opportunities in food and agriculture can benefit them in a multitude of areas. The Michigan Good Food Charter Youth Engagement and Opportunity Work Group focused on three areas: health, career opportunities, and food citizenship (Satchell, Scott, & McClendon, 2011).

 Table 1. Michigan Good Food Charter Goals to Meet or Exceed by 2020

#### Goals

- **1.** Michigan institutions will source 20 percent of their food products from Michigan growers, producers and processors.
- **2.** Michigan farmers will profitably supply 20 percent of all Michigan institutional, retailer and consumer food purchases and be able to pay fair wages to their workers.
- **3.** Michigan will generate new agri-food businesses at a rate that enables 20 percent of food purchased in Michigan to come from Michigan.
- **4.** Eighty percent of Michigan residents (twice the current level) will have easy access to affordable, fresh, healthy food, 20 percent of which is from Michigan sources.
- **5.** Michigan Nutrition Standards will be met by 100 percent of school meals and 75 percent of schools selling food outside school meal programs.
- **6.** Michigan schools will incorporate food and agriculture into the pre-K through 12th grade curriculum for all Michigan students and youth will have access to food and agriculture entrepreneurial opportunities.

*Note.* Adapted from Colasanti, K., Cantrell, P., Cocciarelli, S., Collier, A., Edison, T., Doss, J., George, V., Hamm, M., Lewis, R., Matts, C., McClendon, B., Rabaut, C., Schmidt, S., Satchell, I., Scott, A., Smalley, S. (2010). Michigan Good Food Charter. East Lansing, MI: C.S. Mott Group for Sustainable Food Systems at Michigan State University, Food Bank Council of Michigan, Michigan Food Policy Council. Available from: www.michiganfood.org.

A number of studies have found important relationships between health, diet, and disease

prevention (Darnton-Hill, Nishida, & James, 2004; Food and Nutrition Service, 2010; Freeland-

Graves & Nitzke, 2013; Kavey, 2010, 2016). Fruits and vegetables in the diet can help minimize

the risk of disease, for example, but many youth do not consume adequate amounts of fruits and vegetables (U.S. Department of Health and Human Services, 2008). In Michigan, less than 20% of high school students reported eating the recommended five servings of fruits and vegetables a day and obesity increased from 13.7% in 2011 to 18.5% in 2013 (Centers for Disease Control and Prevention, 2014). Health and nutrition education programs have become important initiatives in response to a high prevalence of youth obesity (Department of Health and Human Services, 2011; Michigan State Board of Education, 2005). Programs have been shown to be successful with youth when they are driven by theory and focus on food behaviors, include a school and community environment that reinforces nutrition education, and involve intensive instruction time including hands-on, experiential learning (Lytle, 1995; Lytle & Achterberg, 1995; Meiklejohn, Ryan, & Palermo, 2016; Murimi et al., 2016).

Food and agricultural education can also open up career pathways for youth in their local and regional food system. Michigan's food and agriculture industry employs about 22% of the state's workforce (Knudson & Peterson, 2012). Compared to past generations, there is a wider range of career opportunities available to those entering the workforce within food and agriculture. The future workforce will need to have skills and proficiencies to meet the demands of a changing agricultural field that is intertwined in a broad range of natural and social sciences disciplines (National Research Council, 2009). Studies suggest that decisions to enroll in postsecondary agricultural programs are influenced by exposure to hands-on educational and work experiences in agriculture and awareness about career opportunities (Esters, 2007; Esters & Bowen, 2005; Smith-Hollins, 2009; Thielen, 2012). The National Research Council recommends that post-secondary programs should reach out to elementary and secondary school teachers to expose students to agricultural experiences and careers. Not only will this help to attract students

into postsecondary agricultural programs but also "foster an interest in and awareness of the role of agriculture in society among its youngest citizens" (National Research Council, 2009, p. 9).

While not all students will enter a career in the food and agricultural industry, they will play a role in the food system as consumers. Many of today's youth have little connection to or understanding of their food systems (Bissonnette & Contento, 2001; Calabrese Barton, Koch, Contento, & Hagiwara, 2005; Hess & Trexler, 2011; Kovar & Ball, 2013). The Michigan Good Food Charter Youth Engagement and Opportunity Work Group writes, "Without intentional teaching, youth who enjoy food abundance may be only vaguely aware of others' food needs, and youth with limited access to healthy food may not understand that a fair, affordable, healthy food system in their community is attainable" (Satchell et al., 2011, p. 8). Food and agricultural education can improve students' literacy and understanding about food systems (Joshi et al., 2008; Kovar & Ball, 2013).

In a study assessing one key program, students in 56 kindergarten through sixth grade classrooms with an integrated Agriculture in the Classroom curriculum possessed a greater knowledge about agricultural themes compared to students in 48 classrooms without the curriculum (Pense, Leising, Portillo, & Igo, 2005). In another study, teachers surveyed in Illinois responded to three, open-ended questions about the benefits of teaching agriculture and resource needs. Two themes emerged regarding the benefits of student learning: connectedness and authenticity. A majority of respondents felt agriculture provided students with a connection to the larger world and an appreciation for farming, agricultural communities, and the environment. Over a third of the respondents felt it provided an authentic learning context for academic subjects (Knobloch et al., 2007). Teachers who used school gardens in California felt that the gardens were effective in improving social skills such as teamwork, sharing, and communication

skills (Graham & Zidenberg-Cherr, 2005). These studies illustrate the impact food and agricultural education can have on students, provided they have the opportunity to participate in a program or classroom with food and agricultural education.

Michigan high school students have the opportunity to enroll in a formal agriculture, food, and natural resources program as part of a Career and Technical Education track if their school has a program (MI School Data, 2015). Many of the high schools with a formal program provide a similar program to middle schools in their district (M. Everett, personal communication, December 12, 2016). However, food and agricultural education at the elementary school levels is limited, and there are few grade level content expectations that address food and agricultural concepts (Satchell et al., 2011). Barriers such as standardized testing, time, and budgets can prohibit the incorporation of non-core curriculum content (Diker et al., 2011; Jones & Zidenberg-Cherr, 2014; Trexler & Johnson, 2000). Resources that are shaped according to teacher needs and their interests in food and agricultural topics may help to expand the incorporation of food and agricultural education into classrooms.

Studies in nutrition education and in agricultural education suggest that many teachers perceive food and agricultural education to be important, and that they would be more likely to incorporate it if they had access to adequate resources (Graham & Zidenberg-Cherr, 2005; Jones & Zidenberg-Cherr, 2014; Knobloch, 2008; Knobloch et al., 2007; Knobloch & Martin, 2002; Knobloch & Martin, 2000; Trexler & Johnson, 2000). Factors such as the value of teaching agriculture, its fit into other academic subjects, and access to resources help to explain the extent to which teachers incorporate food and agricultural topics into classrooms (Knobloch, 2008; Watts, Piñero, Alter, & Lancaster, 2012).

There is a gap in the literature regarding the current perceptions of Michigan teachers regarding food and agricultural education and resource needs. A study by Trexler and Johnson (2000) examined the perceptions and resource needs of Michigan kindergarten through eighth grade teachers. However, the study was conducted prior to the passage of the No Child Left Behind Act in 2001. This act placed a greater responsibility on schools receiving federal funding to meet academic standards (U.S. Department of Education, 2002). A recent study examined the perceived barriers and facilitators of healthy eating and physical activity education in lowincome, Michigan schools (Hammerschmidt et al., 2011). Jones and Zidenberg-Cherr (2014) also explored educational resources and barriers specific to nutrition education in California. These studies, however, did not address agricultural education. There are current studies regarding agricultural education needs and perceptions of elementary teachers in Iowa and Illinois (Knobloch, 2008; Knobloch et al., 2007). Michigan has a diverse agricultural industry and variations in academic state standards and resources. Thus, Michigan teachers are likely to have perceptions about food and agricultural education and resource needs which differ from teachers in other states.

### **Study Overview**

The objective of this study was to explore what food and agricultural topics and resources Michigan elementary school teachers are interested in and what resources they are aware of or already utilizing. The following research questions guided this study:

1) What food and agricultural topics are teachers most interested in incorporating or already incorporating into classrooms?

2) What types and characteristics of resources do teachers find important in food and agricultural education resources?

3) What core subjects are teachers interested in utilizing to deliver food and agriculture education?

4) Are teachers aware of and utilizing already available food and agricultural resources from Michigan-based programs and organizations?

The information gathered from this study can be used to inform the development of food and agricultural education resources and aid in expanding the incorporation of food and agricultural education. Understanding what is already being taught and what resources are being utilized can prevent duplication of efforts, help identify gaps in the education, and allow for collaboration between organizations and programs offering resources.

## **CHAPTER 2. LITERATURE REVIEW**

### **Current Food and Agricultural Education at the Elementary School Level**

Agricultural education at the secondary and post-secondary school levels is federally authorized and funded through the Smith-Hughes Act of 1917 and the Morrill Act of 1862, respectively. School-based food and agricultural education at the elementary level remains limited but has recently been growing alongside the farm to school movement (Joshi et al., 2008; U.S. Department of Agriculture, 2015). The Hunger Free Healthy Kids Act of 2010 established a Farm to School Program within the United States Department of Agriculture (USDA). The program's primary focus is to improve access to local food in eligible schools. It also includes nutrition education and grants for farm to school activities, such as school gardens and food tastings (U.S. Department of Agriculture, 2015). Farm to school is defined by the program as "efforts that bring locally or regionally produced foods into school cafeterias; hands-on learning activities such as school gardening, farm visits, and culinary classes; and the integration of foodrelated education into the regular, standards-based classroom curriculum" (U.S. Department of Agriculture, 2015, p. 3).

The Hunger-Free Kids Act of 2010 also required all local educational agencies or school districts participating in the National School Lunch Program and/or School Breakfast Program to have a local school wellness policy. While there is much flexibility in the content of the policy, all policies are required to include goals for nutrition education and the promotion of student wellness (Team Nutrition, 2016).

Numerous organizations provide materials and resources for in-school food and agricultural education. However, the programmatic outreach of those organizations is likely

limited. National Agriculture in the Classroom (AITC) is coordinated by USDA and each state is responsible for its own statewide organization. As of 2010, it was estimated that the 35 active state-AITC programs reached 5.3 million students, approximately 12% of the kindergarten through eighth grade population (Davis & Bauman, 2013; National Agriculture in the Classroom, 2010). FoodCorps is another educational initiative—it is a national non-profit and grantee of AmeriCorps. FoodCorps service members reached over 182,000 students in 2015 in their mission to connect kids to healthy food in their schools (FoodCorps, 2015).

## **Barriers to Food and Agricultural Education**

#### Time and Academic Standards

Studies have found that teachers perceive time to be a major barrier to food and agricultural education (Diker et al., 2011; Graham & Zidenberg-Cherr, 2005; Hammerschmidt et al., 2011; Jones & Zidenberg-Cherr, 2014; Knobloch et al., 2007; Shumacher et al., 2012; Trexler & Johnson, 2000). This is largely attributed to academic standards and testing. Meeting learning objectives for subjects and standardized testing leave little instructional time for education outside of the core curriculum (Diker et al., 2011; Graham & Zidenberg-Cherr, 2005; Jones & Zidenberg-Cherr, 2014; Knobloch et al., 2007; Trexler & Johnson, 2000).

Teachers situate themselves in the context of the subjects and grades they teach. They are less likely to incorporate content that is not part of the curriculum if they do not perceive the curriculum to fit with the subjects they teach and the standards their students need to achieve (Knobloch, 2008). Kindergarten through eighth grade teachers in Illinois answered three openended questions about the benefits of teaching agriculture. Those who did not believe integrating agriculture was beneficial, rationalized their beliefs based on the subjects they taught. One teacher is quoted as writing, "In Language Arts, as an 8th Grade teacher, I have to prepare my students for the state tests. I haven't found time to teach anything about Agriculture" (Knobloch et al., 2007, p. 26).

Time available for class preparation is also a barrier. Programs which require time to coordinate with faculty and staff or which require the preparation of materials and activities are likely to be difficult for teachers (Diker et al., 2011; Trexler & Hikawa, 2001). In a study by Trexler and Johnson (2000), teachers stated that they viewed experiential activities to be valuable, but required too much time to carry out and would be too costly. Participants felt traditional lessons were more practical. Diker, Walters, Cunningham-Sabo, and Baker (2011) found that the perceived ease of implementing a lesson was an important factor to educators in the decision to download nutrition education materials.

### A Lack of Resources

A perceived lack of resources is a common barrier, particularly for funding and instructional materials (Diker et al., 2011; Hammerschmidt et al., 2011; Jones & Zidenberg-Cherr, 2014; Trexler & Johnson, 2000). In a study of 69 Michigan teachers in low-income schools, a lack of funding was the second greatest barrier to nutrition education in kindergarten through eighth grade classrooms (Hammerschmidt et al., 2011). Time in the school day was the top barrier for the respondents. The researchers noted that the state had "exemplary curricula, programs, and networks of health professionals" to implement nutrition and physical education (Hammerschmidt et al., 2011, p. 65). Despite this, nearly three-quarters of the kindergarten through eighth grade teachers felt there was not enough nutrition education being taught. The researchers attributed this to a decline in statewide funding to deliver nutrition programs, and an

increase in focus on Common Core State Standards in English language arts/literacy and math (Hammerschmidt et al., 2011).

Teachers have commented on a lack of appropriate instructional materials to deliver food and agricultural education (Graham & Zidenberg-Cherr, 2005; Jones & Zidenberg-Cherr, 2014; Knobloch et al., 2007; Trexler & Johnson, 2000). In a study by Trexler and Johnson (2000), a few focus groups participants felt it was important that students learn about connections between the environment, agriculture, and society, but they pointed out a lack of instructional resources to teach about those connections. Jones and Zidenberg-Cherr (2014) also found a majority of respondents felt they did not incorporate nutrition education, in part, due to a lack of appropriate resources.

### Confidence and Interest

A lack of confidence and training in incorporating food and agricultural education have also been cited as barriers by teachers and school principals (Diker et al., 2011; Graham & Zidenberg-Cherr, 2005; Jaeschke et al., 2012; Snelling, Belson, & Young, 2012; Trexler & Johnson, 2000). In a survey of teachers in a large urban area, close to three-quarters of respondents felt it was the teacher's responsibility to address health in the classroom, and it was their role as a teacher to promote healthy habits. However, just over a third of the respondents felt they were prepared or empowered enough to integrate health education into the classroom (Snelling et al., 2012).

Hands-on activities such as school gardening or composting present additional barriers on top of a lack of confidence. In a case study by Shumacher, Fuhrman, and Duncan (2012), teachers in a private school were encouraged to incorporate environmental education into the

school day, including the use of school garden plots and compost piles. They received support from school administrators, freedom in the curriculum, access to resources, and time to collaborate with other teachers. Despite these accommodations, some teachers were resistant towards the incorporation of environmental education. One teacher stated that she would not know what to teach or what would be appropriate for the grade-level. Other teachers stated that they, or their students, were simply not interested in or comfortable with being outside and digging in gardens.

## Facilitators

### Fit with subjects, perceived value, and interests

A common theme in the barriers and facilitators to food and agricultural education is the time required to meet core content standards and standardized testing. Many of the facilitators of food and agricultural education align with core content standards and add value to lessons to leverage the teacher's time (Knobloch, 2008; Knobloch et al., 2007; Trexler & Johnson, 2000). Knobloch (2008) analyzed the beliefs of teachers regarding food and agricultural education with their behavior in integrating food and agricultural topics and activities. Knobloch found that the extent of integration depended on the belief that topics fit with subjects and the value teachers placed on teaching students about the topics (2008).

This supports previous findings that teachers situate themselves in the context of their grade-level and subject content (Knobloch, Ball, and Allen 2007). The perceived benefits, or lack of benefits, of integrating agriculture was viewed from the lens of what they taught. Teachers also expressed interest in topics if they felt they would provide students with concrete connections between the real world and the classroom.

The interests of teachers and students play a role in the decision to incorporate food and agricultural education (Diker et al., 2011; Knobloch, 2008; Knobloch et al., 2007; Shumacher et al., 2012). In Shumacher et al.'s (2012) study, one teacher commented that she takes the students to the woods because they like to hike, even though she does not enjoy it. However, she does not utilize the garden because neither she nor her students are interested in it.

## Resources

Numerous resources have been recommended by teachers to facilitate the incorporation of food and agricultural education. Curriculum materials which are linked to academic standards are one that is most commonly cited (Diker et al., 2011; Graham & Zidenberg-Cherr, 2005; Hammerschmidt et al., 2011; Trexler & Johnson, 2000). In focus groups with Trexler and Johnson (2000), teachers believed that a statewide curriculum specific to different grades would be an effective way to expand agri-food systems education. The teachers in the focus groups also praised the Michigan Model for Health, a grade-specific, comprehensive health curriculum, and suggested developing materials linked to the educational program. In a Michigan-based survey regarding nutrition education, a comprehensive health curriculum with a nutrition module was the second most utilized method to implement nutrition education (Hammerschmidt et al., 2011).

Funding to support educational programs or programs which are free to use are also important to teachers (Hammerschmidt et al., 2011; Jones & Zidenberg-Cherr, 2014; Shumacher et al., 2012; Trexler & Johnson, 2000). Teachers in California indicated that funding to support nutrition education would be the most likely resource to increase the incorporation of nutrition education (Jones & Zidenberg-Cherr, 2014). Free resources can circumvent a lack of funds.

Diker (2011) found that the free use of a nutritional program was an important factor leading to the download of cooking lessons and attributed this to a lack of funds available to teachers.

Respondents in Diker's (2011) study also indicated that they valued resources with hands-on learning. Most respondents felt that hands-on activities were more effective in teaching compared to didactic lessons. Fourth-grade students taking part in a Cooking with Kids program also expressed excitement in the hands-on activities, and students in the cooking program were more likely to consider classmates as friends compared to the control group (Lukas & Cunningham-Sabo, 2011). Focus group participants in Trexler and Johnson's (2000) study found hands-on learning to have merit, however, they felt that it was impractical due to the cost and time associated with hands-on activities.

#### Social and Environmental Supports

Teachers perceive several social and environmental factors to impact their ability to incorporate food and agricultural education, including the school environment, community partnerships, family involvement, and administrative support (Hammerschmidt et al., 2011; Knobloch & Martin, 2002; Lukas & Cunningham-Sabo, 2011; Shumacher et al., 2012). In Shumacher et al.'s (2012) case study of a private school, teachers attributed the support of parents, school administrators, and other teachers as positive influences that impacted the school culture. This enabled teachers to incorporate environmental education throughout the school day. In a survey of Michigan teachers, over half of the respondents indicated that nutrition education was being incorporated in the school through their school wellness policy. Respondents also felt that family involvement would be the best way to further expand nutrition education (Hammerschmidt et al., 2011).

### Collaboration and Outreach

Several studies and reports have recommended that organizations should collaborate with each other and with teachers to create programs and expand their outreach (Hammerschmidt et al., 2011; Knobloch & Martin, 2002; Knobloch & Martin, 2000; Kovar & Ball, 2013; Mercier, 2015; National Research Council, 2009; Trexler & Johnson, 2000). Mercier (2015) and Kovar and Ball (2013) reviewed agricultural education programs and literacy in the US. While they found there were numerous programs being implemented, they suggested the programs reached a limited audience, and a lack of coordination was likely reducing their potential for impact. Studies have also suggested that there is a need for better outreach to teachers regarding available resources. Watts, Piñero, Alter, and Lancaster (2012) surveyed teachers in New York and found respondents with a perceived lack of access to materials spent less time teaching nutrition education compared to teachers who felt they had access to materials. A majority of the respondents wrote that they would be more likely to incorporate nutrition education if they had access to resources. Overall, most respondents were unaware of available materials. Jones & Zidenberg-Cherr (2014) similarly found that California teachers were widely unaware of resources available to them. This finding suggested there was limited outreach from existing resources.

The literature on barriers and facilitators of food and agricultural education suggests that time, adequate resources, awareness of those resources, and interest in food and agriculture play important roles in the incorporation of food and agricultural education. An interest in food and agricultural topics and a perception that topics add value to and fit with lessons influence the incorporation of food and agricultural education (Knobloch, 2008; Shumacher et al., 2012).

Teachers have identified resources, including funding, curricular materials, training, and support as possible methods to expand food and agricultural education (Graham & Zidenberg-Cherr, 2005; Hammerschmidt et al., 2011; Jones & Zidenberg-Cherr, 2014; Trexler & Johnson, 2000). Despite an interest in resources, studies show that teachers are largely unaware of available nutrition education resources (Jones & Zidenberg-Cherr, 2014; Watts et al., 2012). Exploring the current interests of Michigan teachers regarding food and agricultural education and resource needs, and awareness of resources in Michigan, can help shape future resources, collaboration, and outreach.

## **CHAPTER 3. METHODS**

This study assesses Michigan teachers' interest in food and agricultural education and resources and their awareness and use of available resources. The information gathered from this study can be used to inform the development of food and agricultural education resources and allow for collaboration between organizations and programs that offer resources. An electronic survey was implemented to collect data. Its development was based on existing food, agricultural, and nutrition education literature and with input provided by teachers and experts involved in food and agricultural education (Diker et al., 2011; Graham & Zidenberg-Cherr, 2005; Jaeschke et al., 2012; Jones & Zidenberg-Cherr, 2014; Knobloch et al., 2007; Trexler & Johnson, 2000). The survey was open to all Michigan prekindergarten through twelfth grade teachers during the fall of 2015. This study focused solely on respondents who taught students in kindergarten through sixth grade.

## Population

The population of this study are the Michigan kindergarten through sixth grade teachers who responded to the survey. This study is not meant to generalize to the entire population of Michigan kindergarten through sixth grade teachers, but to explore the interests of respondents who are incorporating food and agricultural education or those who have an interest in doing so.

### Survey

The questionnaire was developed based on existing literature, interviews with educators and with input from experts who deliver food and agricultural education. Qualtrics (Provo, UT), an online survey tool, was used to build the questionnaire. Teachers, school principals, Michigan State University Extension agents, and Michigan Good Food Charter team members provided input on the content, wording, and design of the draft survey. It was then pretested on 18 teachers for validity and reliability. The teachers taught students from kindergarten through twelfth grade and came from five different schools. Two Michigan school principals, who provided input towards the development of the survey, requested teachers in their schools to pretest the survey. Additionally, three teachers, who provided input towards the development of the survey, requested teachers in their schools to pretest the survey.

Based on input from teachers and principals, "food, nutrition, and agriculture education" was used in the survey in place of "food and agricultural education." The educators indicated that they strongly associated food and agricultural education with nutrition education, and that they would be more likely to respond to a survey on "food, nutrition, and agriculture education." The survey can be found in Appendix A.

## **Topics**

The selection of food and agricultural topics was informed by the Michigan Good Food Charter and the four components of the charter's definition of "good food," which is food that is healthy, fair, affordable, and green. Input from teachers also informed topic selection and the use of wording. The inclusion of social impacts, economic impacts, and environmental issues associated with food and agriculture, and healthy eating and nutrition all stemmed from the good food components of fair, affordable, green, and healthy. Youth entrepreneurial opportunities and career opportunities were included as topics based on Goal 6 of the charter and agenda priority 9, which focus on providing youth with entrepreneurial opportunities and education about careers

in good food (Colasanti et al., 2010). Food systems were originally included as a topic but changed to "How food travels from farm to plate" based on input from educators. Organic food and farming, information about GMOs, food science, and agricultural sciences were also included based on input from teachers (M. Wloczewski, personal communication, July 31, 2015; S. Hefferon, personal communication, July 30, 2015; A. Suska, personal communication, July 30, 2015). School gardens were included due to their growing popularity and use in schools and based on input from educators (The Farm to School Program, 2016).

Two questions informed the use of and interest in food and agricultural topics. The first question asked teachers if they incorporated topics into their classroom. Respondents answered "Yes" or "No" to each topic. In a second question, respondents were asked to indicate their interest in topics that they did not incorporate, using a 5-point scale from "Very Interested" to "Very Uninterested."

#### Resources

Characteristics and types of resources were selected based on resources available from the 17 programs and organizations found as described above. Existing literature on food and agricultural education resources, barriers, and facilitators to the educations' incorporation were also used to inform the selection of types and characteristics (Diker et al., 2011; Eliassen & Wilson, 2007; Graham & Zidenberg-Cherr, 2005; Jones & Zidenberg-Cherr, 2014; Leggette, Rutherford, Sudduth, & Murphrey, 2012; Trexler & Johnson, 2000). Appendix B and Appendix C provide a list of the resource characteristics and types along with the programs, organizations, and literature from which the characteristics and types came from.

Respondents were presented with a list of resource types and indicated their interest in each type using a 5-point scale from "Very Interested" to "Very Uninterested." Similarly, respondents indicated the importance of each resource characteristic based on a scale from "Very Important" to "Very Unimportant."

## Subjects

The subjects of science, social studies, English language arts, and math were included in the survey. Students in Michigan receive standardized testing for these subjects through the Michigan Student Test of Educational Progress (Michigan Department of Education, 2016). In addition, respondents were able to select health/physical education and an "other" subject box, where they could write-in a subject.

## Resource Awareness

Programs and organizations were selected for use in the questionnaire if they had a statewide presence in Michigan and provided food or agricultural education resources to educators and schools. For programs and organizations based in Michigan, this meant resources must be available statewide. For national programs or organizations, this meant there was a Michigan representative who could be contacted. A Google search was used to find programs and organizations. If websites provided links to additional resources, those links were followed. This resulted in a list of 14 programs and organizations. Educators and experts involved in food and agricultural education provided three additional resources (Fuel Up to Play 60; Milk Means More; and Agriscience instructor). A 5-point scale was utilized to indicate awareness from "I have used this for a resource and plan to keep using it" to "I have never heard of this before." An

open-ended text box was used to allow respondents to enter in additional resources they utilized or were aware of that were not listed in the questionnaire.

## **Barriers**

Five major barriers to food and agricultural education were included in the survey: a lack of instructional time, resource availability, a lack of confidence, educational importance, and support from administrators. Respondents indicated their level of agreement towards statements regarding each barrier. A 5-point scale was utilized, ranging from "Strongly Agree" to "Strongly Disagree." Respondents were asked about these barriers if they indicated that they did not incorporate food and agricultural topics and had no interest in doing so.

## **Data Collection**

School principals, intermediate school districts, Michigan Team Nutrition, and Michigan health coordinators were used as intermediary contacts to reach teachers regarding the survey. These contacts were selected due to an already established relationship with teachers and were suggested by food and agricultural education experts, or have been used in the literature as an intermediary contact to teachers. School principals and Team Nutrition have been used as intermediary contacts to reach out to teachers regarding nutrition and agricultural education (Jaeschke et al., 2012; Jones & Zidenberg-Cherr, 2014; Wall, Least, Gromis, & Lohse, 2012; Watts et al., 2012). Intermediate school districts and school health coordinators often provide food and agriculture-related resources to schools and teachers (Department of Health and Human Services, 2011; Trexler & Hikawa, 2001). Shortly before the close of the survey, an additional intermediary contact through the Michigan Department of Education became available. All

Michigan teachers with a valid teaching certificate were contacted through the department. The Michigan Department of Education also included a statement about the survey through an email-based, weekly communication to Michigan educators.

Dillman's tailored design method was used to inform the development and distribution of the survey (Dillman, Smyth, & Christian, 2014). A raffle was used to incentivize participation and all email recipients were informed that teachers would be eligible to win one of six \$25 gift cards to Amazon.com. Dillman et al. (2014) suggest sending multiple emails to contacts spaced out in intervals to improve response rates. As teachers could not be reached directly, four emails were sent out in two-week intervals to 4,136 prekindergarten through twelfth grade school principals, 57 intermediate school districts, and 32 Michigan Team Nutrition and health coordinators informing them about the survey. Those contacts were requested to assist in distributing the survey to teachers. The first email informed the contacts about the survey. The three subsequent emails contained information and survey links to be distributed to teachers. The initial recruitment letter emailed to contacts can be found in Appendix D. Appendix E contains a follow-up email with the survey invitation for teachers. The survey was extended by two weeks to allow the Michigan Department of Education to send out an email to 123,584 Michigan educators holding a valid teaching certificate.

## **Data Analysis**

Only respondents who taught Michigan students from kindergarten through sixth grade and provided a valid school email address were included in the analysis. This study focused on kindergarten through sixth grade as students in those grades are often in self-contained classrooms. Teachers in those grades are more likely to teach multiple subjects and thus, have a

greater understanding of the requirements within multiple subjects and the feasibility of incorporating food and agricultural topics into those subjects (Trexler & Johnson, 2000). School emails were used to limit the survey to currently practicing teachers and prevent multiple responses from a single individual. Survey data were analyzed for frequencies with Statistical Packaging for Social Sciences (SPSS) version 22.0.

Analysis for the incorporation of topics was based on a "Yes"/"No" response. Interest in topics was based on a 5-point scale from "Very Interested" to "Very Uninterested." This scale was reduced to a 2-point scale for analysis. "Very Interested" and "Slightly Interested" were combined into a single point, "Interested." "Not Interested" included responses for "Neutral," "Slightly Uninterested," and "Very Uninterested." Data for food and agricultural topics were analyzed for frequencies using actual percentages.

Valid percentages were used the for the frequency analysis of types and characteristics of resources on a 5-point scale. The scale for resource types ranged from "Very Interested" to "Very Uninterested." The scale for resource characteristics ranged from "Very Important" to "Very Unimportant."

Interest in topics was based on a 5-point scale from "Very Interested" to "Very Uninterested." Respondents indicated their interest in incorporating topics into subjects using a matrix table with a list of the topics they expressed interest in and a list of the subjects which they taught. The 5-point scale was reduced to a 2-point scale for analysis. "Very Interested" and "Slightly Interested" were combined into a single point, "Interested." "Not Interested" included responses for "Neutral," "Slightly Uninterested," and "Very Uninterested." Actual percentages were used for frequency analysis.

Resource awareness was based on a 5-point scale, ranging from "I have used this for a resource and plan to keep using it" to "I have never heard of this before." Valid percentages were used for the frequency analysis.

Agreement towards possible barriers was based on a 5-point scale, ranging from "Strongly Agree" to "Strongly Disagree." Valid percentages were used for the frequency analysis for barriers.

## **CHAPTER 4. RESULTS AND DISCUSSION**

Of the 1,947 prekindergarten through twelfth grade teachers who participated in the survey, there were 1,193 teachers who taught students from kindergarten to sixth grade. Respondents taught in 747 public and non-public schools, 357 school districts and 76 of Michigan's 83 counties. Over two-thirds of the respondents reported teaching English language arts (70.9%) and math (66.3%). Over half of respondents taught science (60.6%) and social studies (58.2%). Approximately a quarter of respondents taught physical education or health (25.7%) and just under a quarter taught a subject other than those listed (23.1%). While a number of teachers listed "other" subjects, only art (2.7%), music (2.4%), and technology (2.1%) contained 2% or more of respondents.

### Incorporation and interest in incorporation of topics

*Figure 1* shows the percent of teachers interested in incorporating each topic and the percent who already incorporate topics. Seventy-two percent of respondents indicated they would be interested in incorporating at least one food and agricultural topic that they did not already incorporate. School gardening received the greatest interest as a topic to be incorporated (37.2%). This was followed by organic food and farming (32.1%) and youth entrepreneurial opportunities (31.4%).

School gardens have been gaining popularity and have been used as part of farm to



Figure 1. Incorporation and interest in incorporation of food and agricultural topics

*Note*: Interest includes respondents who reported to be very to slightly interested in incorporating the topic on a scale of: 1 = Very Interested, 2 = Slightly Interested, 3 = Neutral, 4 = Slightly Uninterested, 5 = Very Uninterested.

school programs, food and nutrition education, and environmental education (Graham & Zidenberg-Cherr, 2005; Jaeschke et al., 2012; The Farm to School Program, 2016). Studies have suggested that teachers perceive school gardens to be multidisciplinary, provide students with a connection to the food they have grown, improve fruit and vegetable preferences, academic performance, and social skills (Graham & Zidenberg-Cherr, 2005; Morris & Zidenberg-Cherr, 2002; Robinson & Zajicek, 2005).

The other two most popular topics, organic food and farming and youth entrepreneurial opportunities, are not commonly found in the food and agricultural literature at the elementary school level. A New Jersey youth farmstand project for special needs students and at-risk-youth suggests that there may be many benefits in youth entrepreneurial opportunities (Strieter & Hughes, 2009). During the school year, students learn about nutrition, food safety, banking, and finances. They then apply their knowledge working with the farm stand in the summer. Researchers involved with the project reported that during the first five years of the program's run, students improved their work and life skills. This included improvements in nutrition knowledge, food handling, money management, teamwork, and customer service.

Healthy eating and nutrition received the lowest interest for incorporation (13.0%). However, the low interest in healthy eating and nutrition can be attributed to the large percentage of teachers who were already incorporating healthy eating and nutrition (78.1%). Overall, 11 of the 13 topics received interest from at least a quarter of respondents, with the exceptions of agricultural sciences (21.2%) and healthy eating and nutrition (13.0%).

Ninety-two percent of respondents already incorporated at least one food and agricultural topic. As stated above, healthy eating and nutrition was the most widely incorporated topic (78.1%). This was followed by how food travels from farm to plate (51.7%) and local food and

farming (48.5%). The high rate of nutrition education follows the beliefs of Michigan teachers who participated in focus groups about food systems education. The teachers believed that their primary role in food and food systems education was to educate students to make healthy food choices (Trexler & Johnson, 2000). These beliefs are supported with resources and federal requirements. Hammerschmidt et al. (2011) pointed out that Michigan has "exemplary curricula, programs, and networks of health professionals available for [nutrition education] implementation" (p. 65). Schools participating in the National School Lunch Program and/or School Breakfast Program are required to set nutrition education goals through their school wellness policy. The combination of beliefs, resources, and requirements may enable teachers to incorporate nutrition education.

## **Interest in Resources**

The next aim was to determine what resource types and characteristics teachers were interested in. *Figure 2* shows how important each characteristic was to respondents (n = 1,093). It was very important to respondents (85%) that there was no fee to use resources. At least half of the respondents also felt it was very important that resources indicate grade appropriateness (63.5%), state standard alignment (58.5%), be easily found through a search engine (56.4%), and indicate subject fit (50.3%).

*Figure 3* illustrates how interested respondents (n = 1,120) were in each type of resource. Hands-on activities received the greatest interest with 60.2% of respondents who were very interested and 29.1% who were slightly interested in the type. The least amount of interest was in games for the computer and tablet and for resource types involving training workshops.


Figure 2. Importance of resource characteristics

Note: Somewhat Unimportant and Very Unimportant values are all equal to or less than 4.3%; values are not reported in the figure.

However, at least 50% of respondents were very to slightly interested in each type of resource that was listed.

The high importance of resources with no fee is consistent with studies indicating that funding and budgets are a barrier to food and agricultural education (Diker et al., 2011; Hammerschmidt et al., 2011; Jones & Zidenberg-Cherr, 2014). However, there were less teachers interested in grants and other funding opportunities compared to those who felt resources with no fee was very important. Diker et al. (2011) found that the free use of nutrition education materials was an important characteristic leading educators to download the program. Nearly all respondents in that study also indicated the importance of simplicity in resources and ease of use. This can suggest that while limited funding is a barrier, the time required to search for and apply for funding and grants makes it less appealing compared to the easier use of a free resource.



Figure 3. Interest in types of resources

Note: Somewhat Unimportant and Very Unimportant values are all equal to or less than 11.2%; values are not reported in the figure.

The high level of interest expressed toward hands-on activities agrees with most studies. Teachers perceive hands-on activities to be more effective in teaching compared to didactic lessons (Diker et al., 2011; Knobloch et al., 2007). Fourth-grade students taking part in a Cooking with Kids program also expressed excitement in hands-on activities and students in the cooking program were more likely to consider classmates as friends compared to the control group (Lukas & Cunningham-Sabo, 2011). Other teachers have perceived agricultural education to be beneficial because it lent itself to hands-on learning (Knobloch et al., 2007). In contrast, Trexler and Johnson (2000) found that teachers did not want hands-on activities. Participants felt hands-on activities were impractical due to limited budgets and time. This suggests a balance may need to be achieved between the benefit of hands-on learning and the time and cost associated with the resource. Diker et al. (2011) suggested that resources should be hands-on, be free or have a trial period, and be easy to implement.

Interestingly, the two resources involving workshops (teacher training workshops about incorporating food, nutrition and agricultural education into the classroom and teacher training workshops about starting and maintaining a school garden) received a comparatively low amount of interest as a resource type. A lack of confidence in teaching about food and agricultural education has been cited as a barrier to its incorporation (Diker et al., 2011; Graham & Zidenberg-Cherr, 2005; Shumacher et al., 2012; Trexler & Johnson, 2000). Training can provide educators with the knowledge and confidence to teach about food and agricultural education. Teachers who participated in food and agricultural courses or workshops were more likely to incorporate food and agricultural activities into their classroom (Knobloch & Martin, 2002). However, similar to hands-on resources, the time and cost associated with workshops may make them less appealing compared to other resources.

#### **Incorporation of Topics into Subjects**

*Figure 4* indicates the percent of respondents interested in using subjects with topics. Percentages for interest in subject use is reported here as the combined percent of respondents who were very interested and slightly interested in subjects. Social studies and science tended to have the greatest interest as a subject for topic incorporation. Those two subjects, especially that of science, are frequently linked to food and agricultural education (Graham & Zidenberg-Cherr, 2005; Jaeschke et al., 2012; Knobloch et al., 2007; Lukas & Cunningham-Sabo, 2011; Moore, 2008; Trexler & Johnson, 2000). However, English language arts received a surprising amount of interest in many of the topics, which ranged from 3.4% to 11.5% of respondents who were interested. English language arts is less commonly associated with food and agricultural education. In focus groups with Michigan teachers, Trexler and Johnson (2000) only selected science and social studies teachers as participants. The researchers felt science and social studies teachers were most likely to incorporate agri-food system concepts.

Food and agricultural education can fit within many subjects, including English language arts, given its broad range of topics (Satchell et al., 2011). In a study of fourth and fifth graders in 31 California public schools, teachers utilized nutrition education resource kits linked to California Content Standards for English language arts and math (Keihner et al., 2011). Nutrition education lessons involved word scrambles, compositional essays, oral reports, listening and oral communication skills, and journaling. The University of Georgia Extension provides an extensive list of garden-based lessons relating to English language arts, as well as science, math, and social studies (The University of Georgia Extension, 2013). Creating resources which include English language arts, science, and social studies may help to expand the reach of food and agricultural education.



Figure 4. Interest in incorporation of topics into subjects

*Note*: Interest includes respondents who reported to be very to slightly interested in incorporating the topic on a scale of: 1 = Very Interested, 2 = Slightly Interested, 3 = Neutral, 4 = Slightly Uninterested, 5 = Very Uninterested.

#### **Resource Awareness**

Respondents were presented with 17 statewide organizations and programs that provide food and agricultural education resources. *Figure 5* shows respondents were largely unaware of all the organizations and programs listed in the survey. Over half of the respondents (52.2%) were unfamiliar with or had never heard of 15 of the 17 resources. The Michigan Model for Health, a comprehensive kindergarten through twelfth grade curriculum that includes nutrition sections, was the most widely, currently used (14.5%) and previously used (19.4%) resource. Michigan State University Extension and Fuel Up to Play 60 were the next two most used resources. Michigan State University Extension was currently used by 11.4% of respondents at the time of the survey; it provides a variety of food and agriculture-related services. Fuel Up to Play 60 was currently used by 9.9% of respondents; it is a health and nutrition program through the National Dairy Council. Twenty-six respondents provided an additional 27 organizations and programs in an open-ended "Other" text-box (see Appendix F).

The relatively high use of the Michigan Model for Health is consistent with the findings from Hammerschmidt et al. (2011). Michigan teachers indicated that a nutrition module within a comprehensive health curriculum was the second most common method to integrate nutrition education in the school. The school wellness policy, which did not appear in this study's survey, was the top method. Trexler and Johnson (2000) reported that Michigan teachers praised the Michigan Model for Health and the teachers suggested that a food systems education program should emulate the model or link food systems material to the Michigan Model for Health curriculum.

Other studies have also shown teachers are widely unaware of available resources. Yet, a lack of resources is cited as a barrier and respondents percieve more resources as a facilitator to

food and agricultural education (Hammerschmidt et al., 2011; Jones & Zidenberg-Cherr, 2014). This suggests that there may be a lack of outreach by organizations with resources.



Figure 5. Awareness and use of resources

FoodCorps and the Master Gardener Volunteer Program are two examples of programs with room to expand their outreach. Only 27.5% of respondents were familiar with the Master

Gardener program and 12.6% of respondents were familiar with FoodCorps. Both can provide resources for school gardening, which received the greatest interest as a topic for incorporation (FoodCorps, 2015; Master Gardener Program, 2016). FoodCorps also has resources for nutrition education, which was the most widely incorporated topic, and hands-on activities, which received high interest as a resource type. FoodCorps and the Master Gardener program both have resources that align with the interests of teachers, yet a majority of respondents were unfamiliar with both, suggesting that there is room to expand their outreach.

### **Barriers to Food and Agricultural Education**

Only 24 respondents indicated that they did not incorporate any food and agricultural topics and had no interest in doing so. Response bias may have contributed towards the low number of participants indicating a disinterest in food and agricultural topics. Caution should be used in drawing conclusions from the small number of respondents. Nonetheless, the responses can still be useful in shedding light on barriers to food and agricultural education in Michigan.

Respondents were asked about possible reasons for their disinterest in incorporating food and agricultural topics (n = 23) (*Figure 6*). The greatest amount of agreement was with the lack of time in the school day. Nearly two-thirds of respondents strongly agreed that there was not enough instructional time in the school day to incorporate food, nutrition, and agricultural education (65.2%) and none of the respondents disagreed with the statement. Eleven respondents elected to write answers in an "Other" text box. All 11 answers related to subjects or curricula the teachers taught, suggesting that they did not perceive food and agriculture to align with their subjects or core curricula. As stated earlier, limited time due to academic standards and topics that fit with the core curriculum are important issues for teachers.



Figure 6. Possible barriers of food, nutrition, and agricultural education

Only 8.7% of the respondents strongly to slightly agreed that their administrators would not support food and agricultural education. Thirty-one percent of respondents strongly to slightly agreed that they were not confident in teaching about food and agricultural education. Jones and Zidenberg-Cherr (2014) also found that teachers felt a lack of administrative support played a minimal role in the incorporation of nutrition education. The teachers felt a lack of time, relation to subjects, and adequate resources played a larger role. In a qualitative case study by Shumacher et al. (2012), administrators in a school highly encouraged environmental education and the use of school gardens. Barriers for teachers in that study included a lack of comfort, confidence, and interest in teaching about environmental education (Shumacher et al., 2012). Previous research has found that confidence is a barrier to food and agricultural education (Diker et al., 2011; Shumacher et al., 2012; Trexler & Johnson, 2000). In a focus group of Michigan teachers, many participants expressed a lack of confidence in teaching about agriculture. The teachers in the focus groups suggested that resources, including training on how to incorporate agriculture, educational materials and curricula, lists of helpful websites, a network of professionals, and monetary assistance, would help overcome a lack of confidence (Trexler & Johnson, 2000). However, a majority of respondents, who were disinterested in food and agricultural education in my study, were neutral towards the availability of resources. This may suggest that they are either not aware of available resources and cannot make a judgement, or they do not care about the availability because they have no interest in food and agricultural education.

Teacher training workshops on food and agriculture and workshops that provide agricultural experiences to teachers may help to overcome a disinterest in food and agricultural education and improve confidence. Knobloch and Martin (2002) assessed characteristics explaining the extent to which elementary teachers incorporated agricultural education. They found that teachers who had taken agricultural classes, workshops, or had agricultural experiences incorporated agricultural education to a greater extent, compared to teachers who did not have those experiences (Knobloch & Martin, 2002). Teacher training workshops and preservice training programs have been suggested as a method to provide teachers with agricultural and environmental experiences, improve comfort and confidence, and spark an interest in agriculture and the environment (Knobloch & Martin, 2002; Shumacher et al., 2012).

#### **Limitations and Assumptions**

This study utilized an electronic survey method. Electronic surveys rely on email contacts and a web-based survey to collect responses (Dillman et al., 2014). They have an advantage of being a low-cost method for distributing surveys and collecting responses in a short amount of time from a large population (Dillman et al., 2014). A wide distribution of the survey was desired to increase chances of identifying local and obscure resources used by teachers. This information can be used to build a network between organizations with food and agricultural education resources and allow for collaboration between organizations and programs.

One disadvantage of electronic surveys is typically low response rates compared to a mixed-method, mail, or phone survey. Response rates can be hindered by a lack of access to the internet and a lack of comfort in using email and web-based surveys, especially with contacts in rural areas, older populations, or those who have a lower level of education (Dillman et al., 2014). It was assumed that this barrier would be minimized in the study population as all teachers would possess at least a college-level education and a school email address.

An additional disadvantage in this study was a lack of direct access to Michigan school teacher emails. However, feedback from teachers who reviewed the draft survey suggested that many teachers would ignore emails coming from an address they did not recognize, and they would be more likely to read an email from their school principal or an established contact. Due to indirect access, it is not possible to analyze response rates and this study is not generalizable to the population of Michigan elementary school teachers, but to those who responded to the survey.

There is also the potential for response bias, which may play a role in the high interest respondents expressed in food and agricultural topics and resources. The actual adoption rates of

resources and food and agricultural education shaped according to these interests may be much lower. Additionally, this study did not assess to what extent teachers incorporate or are interested in incorporating food and agricultural topics. The frequency and length of time teachers spend, or are interested in spending, on food and agricultural topics may be minimal.

### **CHAPTER 5. CONCLUSIONS**

This study suggests that there is interest in food and agricultural education and that resources shaped according to the interests of teachers may help to expand the incorporation of food and agricultural education in Michigan K-6 classrooms. It is important that resources have no fee and that they emphasize hands-on activities. There is room for expansion in many food and agricultural topics, including school gardening, information about organic food and farming, and youth entrepreneurial opportunities. In addition to incorporating food and agricultural education into science and social studies, there is also interest in using English language arts as a subject. Teachers are unaware of many of the statewide programs offering resources, suggesting there is room for programs to reach out to teachers.

Based on the findings from this study, several recommendations can be made towards the development of resources. There is room for resources to expand into English language arts. The University of Georgia Extension provides an extensive list of garden-based lessons relating to English language arts, as well as science, math, and social studies (The University of Georgia Extension, 2013). English language arts lessons on the list include books to read, writing assignments, and speaking and listening activities with professionals involved in food and agriculture. All lessons are categorized by grade, subject content, and align with Georgia educational standards. Similar resource lists adapted to Michigan English language arts content standards, as well as other subjects, may be useful for teachers.

Respondents indicated an interest in youth entrepreneurial opportunities. However, there are limited resources for or research regarding youth entrepreneurial opportunities in K-6 food and agricultural education. Future research can address this gap and search for best practices for

implementing youth entrepreneurial opportunity programs. Partnerships with existing Michigan organizations that offer youth entrepreneurial opportunities may help bring entrepreneurial programs into more classrooms.

A possible partnership with a youth entrepreneurial program is the Detroit Food Academy. The Detroit Food Academy is an organization that uses place-based, experiential food and entrepreneurial opportunities to foster leadership skills and confidence in high school students (Detroit Food Academy, 2015). The FFA, formerly known as the Future Farmers of America, provides a supervised agriculture experience for FFA students. Students have the opportunity to apply what they have learned in the classroom to a workplace environment. Entrepreneurial opportunities are among the various types of supervised agriculture experience programs students can choose to pursue (Rank & Retallick, 2016). The Detroit Food Academy and FFA's supervised agriculture experiences both focus primarily on high school students. An opportunity exists to bring similar programs to elementary school students.

Resources can take advantage of the high use of nutrition education. Nutrition was the most popular topic already incorporated into classrooms. Research into factors contributing to the greater incorporation of nutrition education may point towards methods that can be utilized to expand the reach of other topics. Creating resources that link to the Michigan Model for Health and school wellness policies may also help. Hammerschmidt et al. (2011) suggested that there was a strong network of professionals available in Michigan to assist with nutrition education. Collaboration with those networks can strengthen the reach of food and agricultural education and address gaps and overlaps in the content of programs. Possible networks include Michigan Team Nutrition, Michigan school health coordinators, the Michigan Nutrition Network, and the Michigan Fitness Foundation.

A partnership is already occurring between FoodCorps and Michigan Team Nutrition. In January 2016, Michigan State University Extension announced that FoodCorps would be starting a new partnership with Michigan Team Nutrition. Their partnership illustrates how organizations can combine school gardens with nutrition education, reduce costs of activities for schools, and work together to expand their reach. Team Nutrition is an initiative setup by the USDA Food and Nutrition Service to support efforts that promote healthy food choices and physical activity in youth. Michigan Team Nutrition is housed within the Michigan Department of Education. Through the partnership, schools receive mini-grants to offset costs related to school garden activities. FoodCorps service members are paired up with Michigan State University Extension health and nutrition staff to implement activities (McLean, 2016).

A small handful of respondents indicated a lack of interest in food and agricultural education, regardless of resource availability. Pre-service training and workshops that provide agricultural experiences have been suggested as a method to increase a teacher's interest in agriculture, thereby increasing the likelihood that a teacher will incorporate agricultural education (Knobloch & Martin, 2002; Shumacher et al., 2012). The training and workshops can also be useful to inform participants about resources and activities that incorporate core content standards. There is an agriculture, food and natural resource pre-service training program at Michigan State University. Attracting education students, who are outside of the agriculture, food and natural resource field, to take classes in the program may help foster a greater interest in food and agriculture. Workshops may be beneficial to teachers who have completed their preservice training and are already teaching.

Improving the outreach of programs and creating resources that incorporate the interests of teachers may help to advance goal six of the Michigan Good Food Charter, which is to

incorporate food and agriculture education into all Michigan K-12 classrooms. The Charter can provide a space for organizations to collaborate on food and agricultural education programs and resources. The Center for Regional Food Systems at Michigan State University is a backbone organization of the Michigan Good Food Charter and works to build partnerships across Michigan and coordinate networks. As such, it is well suited to assist in building networks between existing organizations with food and agricultural education resources.

Respondents in this study expressed interest in many food and agricultural topics and resources, but a majority of respondents were unaware of existing organizations and programs that deliver resources. Improving outreach and providing resources that incorporate the interests of teachers may help to expand the reach of food and agricultural education.

APPENDICES

### Appendix A: Online Survey

#### Introduction

# Thank you for your participation in the Food, Nutrition and Agriculture Resources for Michigan Teachers Survey!

This is a research survey which has been developed to address <u>Goal 6</u> of the <u>Michigan Good Food Charter</u> and as part of the completion of a master's degree in the Department of Community Sustainability at Michigan State University. The MSU Center for Regional Food Systems coordinates work on the Michigan Good Food Charter.

#### Food, nutrition and agriculture education is...

...any educational strategy which provides students with knowledge about food, agriculture and healthy eating. This may include improving food, nutrition and agricultural literacy or teaching skills about how to grow food or make healthy food choices. Students may learn about the environmental, economic and social impacts associated with food and agriculture, take a field trip to a local farm or learn about GMOs (genetically modified organisms). Food, nutrition and agriculture education encompasses a broad range of topics!

#### By participating in this survey,...

➤ You are providing valuable input about how interested or uninterested Michigan school teachers are in food, nutrition and agriculture resources for education.

➤ You can help shape what topics food, nutrition and agriculture resources focus on and for which grades and subjects.

➤ You can inform organizations and interested Michigan school teachers about what educational resources you are aware of, which ones you use and what types of resources you would like more access to.

#### Directions:

➤This survey is open to Michigan PreK-12 school teachers. The survey takes about 10-14 minutes to complete. Upon successful completion and submission of the survey, you will be eligible to win one of six \$25 Amazon e-gift cards. Each individual may only be entered into the raffle once. The winners will be selected and notified at the close of the survey.

> The deadline for survey completion is November 20th, 2015.

≻For ease of reading, it is recommended that you complete the survey on a computer or tablet.

 $\succ$  You may stop and return to the survey at any time *if* you are using the same computer and web browser and until any of the following scenarios occurs: two weeks have passed since beginning the survey, the cookies on your web browser have been cleared or the survey has closed.

 $\succ$  If you have already completed and submitted this survey, thank you for your time and input! You may close this window to exit the survey.

## Once again, *thank you* for helping to shape food, nutrition and agriculture resources for Michigan teachers!

#### Before starting the survey, please read the following:

#### **Your Rights:**

This survey is completely voluntary. You may choose not to participate at any time and you may choose not to answer a question at any time. By clicking on the "Begin Survey" button below, you voluntarily agree to participate in this online survey.

#### **Confidentiality:**

Electronic data will be password protected on a secure server and in a password protected computer. Data will be stored for 3 years following the completion of this study. The project investigators, project coordinator and IRB, who have taken the MSU Institutional Review Board tutorial will be the only individuals with access to the research data. Your confidentiality will be protected to the maximum extent allowable by law.

#### **Privacy:**

The information you provide may be used as data in a public document (e.g. research journal article, Extension materials) outlining the interest in and use of food, nutrition and agriculture resources for education in Michigan. Your organization, email and any other identifying or personal information will not be made available in any way. No financial or other personal information will be asked for or disclosed at any time. There is no conflict of interest present in this study. If you have any questions regarding potential conflict of interest, please contact Samantha Loscalzo using the contact information provided below.

#### **Contact:**

If you have questions or concerns about your role and rights as a research participant, would like to obtain information or offer input, or would like to register a complaint about this study, you may contact, anonymously if you wish, the Michigan State University's Human Research Protection Program at 517-355-2180, Fax 517-432-4503, or e-mail irb@msu.edu or regular mail at 207 Olds Hall, MSU, East Lansing, MI 48824

If you have any concerns or questions about this research study, such as scientific issues, how to complete any part of it, or have any comments, please contact Samantha Loscalzo, Research Assistant at Michigan Good Food Charter, by email at Loscalzo@msu.edu or by phone at 517-721-7010.

#### Survey

Please select all that apply. During the 2015-16 school year, I am likely to teach students in...

Pre-K	Seventh
Kindergarten	Eighth
First	Ninth
Second	Tenth
Third	Eleventh
- Fourth	🔲 Twelîth
Fifth	Other (e.g. resource room)
Sixth	

Please select all that apply. During the 2015-16 school year, I am likely to teach...

Scie	ence		
Soc	ial Studies		
Matl	h		
🗌 Lan	guage Arts		
🗌 Hea	alth/Phys. Ed		
Othe	er		

Below is a list of food, nutrition and agriculture topics. For **each** topic, please indicate if you do or do not incorporate it into your classroom.

Yes	Νο	

School gardening	0	0
Economic impacts associated with food and agriculture	0	0
Information about GMOs (genetically modified organisms)	0	0
Career opportunities in agriculture	0	0
Food Science (?)	0	0
Agricultural sciences (e.g. soil, crop or animal sciences)	0	0
Youth entrepreneurial opportunities	0	0
How food travels from farm to plate	0	0
Environmental issues associated with food and agriculture	0	
Healthy eating and nutrition	0	0
Social impacts asociated with food and agriculture	0	
Information about organic food and farming	0	0
Local food and farming	0	Θ
Other(s)	0	0

Below is one or more topics which you indicated as incorporating into your classroom. For **each** topic, please select which subject(s), if any, you integrate the topic into.

	None	» Science	» Social Studies	» Math	» Language Arts	» Health/Phys. Ed	» Other
» School gardening						6	
» Local food and farming							
>>> How food travels from farm to plate							
» Youth entrepreneurial opportunities							
» Healthy eating and nutrition							
» Environmental issues associated with food and agriculture							
» Economic impacts associated with food and agriculture							
» Social impacts asociated with food and agriculture							
» Career opportunities in agriculture							
Information about GMOs (genetically modified organisms)							
» Information about organic food and farming							
» Food Science (?)							
» Agricultural sciences (e.g. soil, crop or animal sciences)							
» Other(s)		6					

Below is a list of resources which could assist teachers to incorporate food, nutrition and agriculture education into the classroom. Please indicate how interested or uninterested you are in *each* food, nutrition and agriculture resource.

	Very Interested	Slightly Interested	Neutral	Slightly Uninterested	Very Uninterested
Experts to teach programs	0	0	0	0	0
Resources which state their alignment to grade, subject and state standards.	۲	0	0	0	0
A searchable database of educational materials based on grade, subject and state standards alignment	0	0	0	0	0
Suggestions for field trip destinations	0	0	0	0	0
Teacher training workshops about incorporating food, nutrition and agriculture education into the classroom	0	0	0	0	0
Games for tablets	0	0	0	0	•
Lesson plans	0	0	0	0	0
Grants and other funding opportunities	0	0	0	0	0
Hands-on activities	0	0	0	0	0
Educational videos	0	0	0	0	0
Teacher training workshops about starting and maintaining a school garden	0	0	0	0	0
Computer games	0	0	0	0	0
Other(s)	0	0	0	0	0

Below is a list of one or more resources which you indicated as being interested in. How often would you be interested in using those resources to incorporate food, nutrition and agriculture into your classroom?

	Once a year	2-3 times a year	Once a month	Once a week	Multiple times a week
Lesson plans	0	0	0	0	0
Hands-on activities	0	$\odot$	0	0	0
Educational videos	0	0	0	0	0
Computer games	0	0	0	0	0
Games for tablets	0	0	0	0	0
Experts to teach programs	0	$\odot$	$\odot$	$\odot$	$\odot$

If there were resources available which could better assist you, would you or would you not be interested in incorporating food, nutrition and agriculture education in your classroom? Please select which answer you most agree with.

I would be interested regardless of resource availability.

I would be interested if there were resources which could assist me.

No, I have no interest.

Please rate how strongly you agree or disagree with the following statements regarding food, nutrition and agriculture education.

	Strongly Agree	Slightly Agree	Neutral	Slightly Disagree	Strongly Disagree
I am not confident in teaching about food, nutrition and agricultural education.	9	0	0	Θ	0
There are not enough food, nutrition and agricultural resources available to teachers.	0	0	0		0
I do not think food, nutrition and agricultural education is important.	0	Θ	0	0	۲
There are too many food, nutrition and agricultural resources.	6	•	0	0	٢
My administrator would not support food, nutrition and agricultural education.	0	0	0	0	0
There is not enough instructional time in the school day to incorporate food, nutrition and agricultural education.	0	•	0	0	0
Other reasons for not teaching food, nutrition and agricultural education:	0	Θ	0	0	0

Below is a list of characteristics of resources. Please indicate how important or unimportant each characteristic is to you.

	Very Important	Somewhat Important	Neutral	Somewhat Unimportant	Very Unimportant
The resource indicates what grade it is appropriate for.	0	٢	0	0	0
The resource indicates what subject it fits in with.	0	0	0	0	0
The resource indicates what state standard it aligns with.	0	0	0	Θ	0
The resource is referred by an expert in the field.	0	0	0	0	
The resource can easily be found through a search engine such as Google.	0	0	٥	0	
There is no fee to use the resource.	0	0	0	0	0
The resource is referred by another teacher.	0	0	0	0	0
Other characteristic(s)	0	0	0	0	Θ

Below is a list of food, nutrition agriculture topics you *do not* incorporate into your classroom. If there were resources available which could better assist you, please rate how interested or uninterested you would be in incorporating *each* topic into your classroom.

	Very Interested	Slightly Interested	Neutral	Slightly Uninterested	Very Uninterested
» School gardening	0		0	6	0
» Local food and farming	0	•	0	0	0
» How food travels from farm to plate	0	0	0	0	0
» Youth entrepreneurial opportunities	0	0	0	0	0
» Healthy eating and nutrition	0	0	0	0	0
» Environmental issues					

associated with food and agriculture	0	•	0	0	0
» Economic impacts associated with food and agriculture	0	0	0	0	0
» Social impacts asociated with food and agriculture	0	0	0	0	0
» Career opportunities in agriculture	0	0	0	0	0
» Information about GMOs (genetically modified organisms)	0	Θ	0	0	0
» Information about organic food and farming	0	0	0	0	0
» Food Science (?)	0	0	0	0	6
» Agricultural sciences (e.g. soil, crop or animal sciences)	0	0	0	0	0
» Other(s)	0	0	0	0	0

Below is one or more topics which you indicated as being interested in if there were resources available to assist you. For *each* topic, please select which subject(s), if any, you would like to integrate the topic into.

	None	» Science	» Social Studies	» Math	» Language Arts	» Health/Phys. Ed	» Other
School gardening	8						
Social impacts asociated with food and agriculture		6					0
Healthy eating and nutrition							
Local food and farming							
Youth entrepreneurial opportunities							
Economic impacts associated with food and agriculture							
Environmental issues associated with food and agriculture							
Career opportunities in agriculture							
How food travels from farm to plate							
Other(s)							8
Information about GMOs (genetically modified organisms)							
Information about organic food and farming							
Food science							
Agricultural sciences (e.g. soil, crop or animal sciences)							

Below is a list of local and statewide organizations and programs which provide resources to teachers. These resources may include grants, workshops, events, websites, lesson plans, etc.

Please indicate how familiar you are with each organization and program.

This list does not contain all organizations and programs available. If you use resources from an organization or program not listed, *please enter that organization or program into the "Other resource(s)" option.* 

	I have used this for a resource and plan to keep using it.	l have used this for a resource but do not anymore.	l have heard of this and am familiar with it but have never used it.	l have heard of this but am not familiar with it.	l have never heard of this before.
Michigan State University Extension (MSUE)	0	۲	0	0	۲
Master Gardener Volunteer Program (supported through MSUE)	0		0	0	0
4-H (supported through MSUE)	0	0	0	0	0
United Dairy Industry of Michigan (UDIM)	0	0	0	0	0
Milk Means More (UDIM campaign)	0	0	0		0
Fuel Up to Play 60	0	0	0	0	0
	I have used this for a resource and plan to keep using it.	l have used this for a resource but do not anymore.	l have heard of this and am familiar with it but have never used it.	l have heard of this but am not familiar with it.	I have never heard of this before.
Michigan Farm Bureau	0	0	0	0	0
Michigan Ag in the Classroom (sponsored by Michigan Farm Bureau)	0			0	0
Rural Education Day (sponsored by Michigan Farm Bureau)	0	0	0	0	0
Michigan Apple Committee	0	0	0	0	0
Michigan Fitness Foundation	0	0	0	0	0
Michigan Soybean Committee	0	0	0	0	0
	I have used this for a resource and plan to keep using it.	l have used this for a resource but do not anymore.	l have heard of this and am familiar with it but have never used it.	l have heard of this but am not familiar with it.	I have never heard of this before.
FoodCorps	0	0	0	0	0
Michigan Model for Health - Educational Materials Center	0	0	0	0	
Building Healthy Communities - Wayne State University	0		0	•	0
Michigan FFA (formerly Future Farmers of America)	0		0	0	0
Agriscience instructor or FFA advisor	0	0	0	0	0
Other resource(s)	0	0	0	0	0

Please enter the full name of the school you teach in. If you teach in more than one school, please list all of them.

Please enter the full name of the school district you teach in.

Please enter the email provided to you by the school you teach at. This will remain confidential and will only be used to prevent duplicate survey entries.

Email

Are there any comments or suggestions that you would like to add?

In appreciation of your time, would you like to be entered into a raffle to win one of six **\$25 Amazon gift cards**? If yes, please enter the email or phone number that you wish to be contacted at should you win. This will remain confidential and will only be used to contact you should you win one of the raffle prizes.

O Yes O No

## Appendix B: Sources of Resource Characteristics

Resource Characteristics	Organization/Program with Resource Characteristic	Reference to Characteristic in Literature
The resource can easily be found through a search engine such as Google.		(Trexler & Johnson, 2000)
The resource indicates what grade it is appropriate for.	Rural Education Days; Michigan Apple Committee; Michigan Farm Bureau; Michigan Fitness Foundation; Building Healthy Communities; Michigan Ag in the Classroom	(Jones & Zidenberg-Cherr, 2005)
The resource indicates what state standard it aligns with.	Rural Education Days; Michigan Apple Committee	(Jones & Zidenberg-Cherr, 2005)
The resource indicates what subject it fits in with.	Rural Education Days; Michigan Apple Committee; MSUE; Michigan Fitness Foundation; 4H; Michigan Farm Bureau	(Jones & Zidenberg-Cherr, 2005)
The resource is referred by an expert in the field.		(Diker et al., 2011)
The resource is referred by another teacher.		(Diker et al., 2011)
There is no fee to use the resource.	Rural Education Days; Michigan Apple Committee	(Diker et al., 2011; Trexler & Johnson, 2000)

## Table 2. Source of Resource Characteristics

## Appendix C: Sources of Resource Types

## Table 3. Sources of Resource Types

Resource Type	Organization/Program with Resource Type	Reference to Type in Literature
A searchable database of educational materials based on grade, subject and state standards alignment	Michigan Farm Bureau; Rural Education Days; Michigan Soybean Committee	(Trexler & Johnson, 2000)
Computer games	Michigan Apple Committee	(Leggette, Rutherford, Sudduth, & Murphrey, 2012)
Educational videos	Michigan Fitness Foundation; Michigan Soybean Committee	(Trexler & Johnson, 2000)
Experts to teach programs	Fuel Up to Play 60; Michigan State University Extension; Master Gardener Volunteer Program; Michigan Farm Bureau; Michigan Ag in the Classroom; Rural Education Day; Michigan Fitness Foundation; Michigan Soybean Committee; FoodCorps	(Trexler & Johnson, 2000)
Grants and other funding opportunities	4H; Building Healthy Communities; Master Gardener Volunteer Program; Fuel Up to Play 60; Michigan Farm Bureau; FoodCorps	(Hammerschmidt, Tackett, Golzynski, & Golzynski, 2011; Jones & Zidenberg- Cherr, 2005; Trexler & Johnson, 2000)
Hands-on activities	FoodCorps; Michigan Farm Bureau; Rural Education Day; Michigan Apple Committee; Michigan Fitness Foundation; Michigan Soybean Committee	(Diker et al., 2011; Eliassen & Wilson, 2007; Trexler & Johnson, 2000)
Lesson plans	Building Healthy Communities; 4H; Michigan Farm Bureau; Michigan Ag in the Classroom; Rural Education Day; Michigan Apple Committee; Michigan Fitness Foundation	(Diker et al., 2011; Trexler & Johnson, 2000)
Resources which state their alignment to grade, subject and state standards.	Michigan State University Extension; 4H; Michigan Farm Bureau; Rural Education Day; Michigan Apple Committee; Michigan Fitness Foundation	(Diker et al., 2011; Eliassen & Wilson, 2007; Graham & Zidenberg-Cherr, 2005; Jones & Zidenberg-Cherr, 2014; Trexler & Johnson, 2000)

Table 3 (cont'd)

Suggestions for field trip destinations	Michigan Farm Bureau; Rural Education Day; Michigan Apple Committee; Michigan Fitness Foundation; Michigan Soybean Committee; FoodCorps	(Trexler and Johnson; 2000)
Teacher training workshops about incorporating food, nutrition and agriculture education into the classroom	Building Healthy Communities; Michigan Ag in the Classroom; Rural Education Day; Michigan Apple Committee; Michigan Soybean Committee	(Graham & Zidenberg-Cherr, 2005; Hammerschmidt, Tackett, Golzynski, & Golzynski, 2011; Trexler and Johnson; 2000)
Teacher training workshops about starting and maintaining a School garden	Michigan State University Extension; FoodCorps	(Diker, Walters, Cunningham-Sabo, & Baker, 2011; Hammerschmidt, Tackett, Golzynski, & Golzynski, 2011; Jones & Zidenberg-Cherr, 2014; Trexler & Johnson, 2000)

## Appendix D: Initial Recruitment Email



MSU CENTER for REGIONAL FOOD SYSTEMS

Greetings!

As part of its Michigan Good Food Charter work, the Michigan State University Center for Regional Food Systems is surveying Michigan PreK-12 teachers regarding their interest in, awareness of, and use of food, nutrition and agriculture resources for education. This online survey is also designed as part of the completion of a master's degree at Michigan State University. Your assistance will be vital in informing teachers about the Food, Nutrition and Agriculture Resources for Michigan PreK-12 Teachers Survey.

Teachers are understandably busy and overburdened. Educational resources should be shaped to provide as much assistance as possible to teachers. By filling out the survey...

- Teachers are providing valuable input about how interested or uninterested they are in food, nutrition and agriculture resources for education.
- Teachers will help shape what topics food, nutrition and agriculture resources focus on and for which grades and subjects.
- Teachers will inform organizations and other interested Michigan school teachers about what educational resources they are aware of, which ones they use and what types of resources they would like more access to.

The online survey will take approximately ten to fourteen minutes to complete. Teachers who complete and successfully submit the survey will be eligible to win one of six **\$25 amazon gift cards**.

You will be sent an email in within a few days with information about the survey and a link to the survey for Michigan PreK-12 school teachers. Please send that email to the **PreK-12 school teachers in your school.** Your assistance will be instrumental in distributing the survey to teachers!

If you have any questions about the survey, please do not hesitate to contact Samantha Loscalzo@msu.edu or 517-721-7010. If you are interested in the findings from the study or what food, nutrition and agricultural education resources teachers use, please send an email to Loscalzo@msu.edu with "Interest in FNA survey findings" in the subject line.

For more information about the Michigan Good Food Charter, you can go to this website: Michiganfood.org. The Michigan Good Food Charter is a roadmap for a food system that is rooted in local communities and centered on good food. This survey will help with our understanding of progress on Goal 6: that Michigan schools will incorporate food and agriculture into the pre-K through 12th grade curriculum for all Michigan students and youth will have access to food and agriculture entrepreneurial opportunities.

### Thank you for your time, assistance and dedication to Michigan youth!

Sincerely, Samantha Loscalzo

Research Assistant Center for Regional Food Systems Michigan State University www.michiganfood.org www.foodsystems.msu.edu

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Master's Student Department of Community Sustainability Michigan State University

Email: Loscalzo@msu.edu Phone: 517-721-7010

## Appendix E: Follow-up Survey Invitation for Teachers



MSU CENTER for REGIONAL FOOD SYSTEMS

### Greetings!

As part of its Michigan Good Food Charter work, the Michigan State University Center for Regional Food Systems is surveying Michigan PreK-12 teachers regarding their interest in, awareness of, and use of food, nutrition and agriculture resources for education. This online survey is also designed as part of the completion of a master's degree at Michigan State University.

Teachers are understandably busy and overburdened. Educational resources should be shaped to provide as much assistance as possible to teachers. By filling out the survey...

- Teachers are providing valuable input about how interested or uninterested they are in food, nutrition and agriculture resources for education.
- Teachers will help shape what topics food, nutrition and agriculture resources focus on and for which grades and subjects.
- Teachers will inform organizations and other interested Michigan school teachers about what educational resources they are aware of, which ones they use and what types of resources they would like more access to.

You will find a link below to the Food, Nutrition and Agriculture Resources for Michigan Teachers Survey. The online survey will take approximately ten to fourteen minutes to complete. Teachers who complete and successfully submit the survey will be eligible to win one of six **\$25 amazon gift cards**.

If you have any questions about the survey, please do not hesitate to contact Samantha Loscalzo@msu.edu or 517-721-7010. If you are interested in the findings from the study or what food, nutrition and agricultural education resources teachers use, please send an email to Loscalzo@msu.edu with "Interest in FNA survey findings" in the subject line.

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Thank you for your time, assistance and dedication to Michigan youth!

**Follow this link to the survey:** <u>FNA Survey</u>

Or copy and paste the URL below into your internet browser: http://msucarrs.az1.qualtrics.com/SE/?SID=SV\_brQdAM9WdkLihRH

Thank you for your time, assistance and dedication to Michigan youth!

Sincerely, Samantha Loscalzo

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## Appendix F: Additional Organizations and Programs with Food and Agricultural Education Resources

Table 4. Additional Organizations and Program.	s with Food and Agricultural Education
Resources	

Organization/Partnerships	Program	Website
Sustainable Agriculture Research & Education	SARE	http://www.sare.org/
(SARE)		
Sustainable Agriculture	SARE Learning	http://www.sare.org/Learning-Center
Research & Education	Center	
Sustainable Agriculture	SARE in	http://www.northcentralsare.org/State-
Research & Education	Michigan	Programs/Michigan?_ga=1.58804266.68 0053882.1455903577
YMCA	N/A	http://www.ymca.net/
National Kidney Foundation of Michigan	Regie's Rainbow Adventure	http://www.nkfm.org/kids-teens/early- childhood-elementary-education- programs/regie%E2%80%99s-rainbow- adventure
National Kidney Foundation of Michigan; Michigan Nutrition Network at the	PE-Nut	http://www.nkfm.org/kids-teens/early- childhood-elementary-education- programs/pe-nut-elementary-school-
Michigan Nutrition Network	Nutrition	http://www.michigannutritionnetwork.or
at Michigan Fitness	Enhanced EPEC	g/epec-training
Foundation	(Exemplary	
	Physical	
	Education	
Von Duron ISD	Droiget LEAN	http://www.mach.org/ml. project loop
Van Buren ISD	(Linking	vanburen-isd-edex2015.aspx
	Education,	
	Activity and	
	Nutrition)	
United States Department of Agriculture (USDA)	N/A	
United States Department of Agriculture (USDA)	ChooseMyPlate	http://www.choosemyplate.gov/

Table 4 (cont'd)

Community - University of Michigan Collaborative	Project Healthy Schools	http://www.projecthealthyschools.org/
National Institute of Health	N/A	http://www.nih.gov/research- training/science-education#teachers
Crim Fitness Foundation	CrimFit Programs	http://crim.org/programs/youth/
Crim Fitness Foundation	Garden to School Teacher Training	http://crim.org/programs/youth/garden-to- school-teacher-training/
Michigan Corn Growers Association	Corn Marketing Program of Michigan	http://www.micorn.org/corn-education
Marquette Food Co-op	N/A	http://marquettefood.coop/classes/classes/
Lake Superior State University	N/A	http://www.lssu.edu/arl/outreach.php
Lake Superior Stewardship Initiative	N/A	http://lakesuperiorstewardship.org/projects.p hp
Greening of Detroit	N/A	http://www.greeningofdetroit.com/
Detroit Black Community Food Network Security	Food Warriors Youth Development Program	http://detroitblackfoodsecurity.org/
Washtenaw County Parks and Recreation	County Farm Park	http://www.ewashtenaw.org/government/de partments/parks_recreation/horticulturist/hor t_cfp.html
Detroit Food Policy Council	N/A	http://detroitfoodpolicycouncil.net/
Detroit Food Academy	N/A	http://detroitfoodacademy.com/

Table 4 (cont'd)

Central Detroit Christian	N/A	http://centraldetroitchristian.org/
D-Town Farms	N/A	http://www.d-townfarm.com/
Curriculum for Agricultural Science Education	N/A	http://www.case4learning.org/
Blue Cross Blue Shield Blue Care Network of Michigan	Building Healthy Communities Program	http://www.bcbsm.com/index/about-us/why- choose-us/healthy-communities/grants-and- contributions/building-healthy- communities-program.html
Curriculum for Agricultural Science Education Blue Cross Blue Shield Blue Care Network of Michigan	N/A Building Healthy Communities Program	http://www.case4learning.org/ http://www.bcbsm.com/index/about-us/why- choose-us/healthy-communities/grants-and- contributions/building-healthy- communities-program.html

*Note*. Respondents provided either an organization or a program name in an open-ended textbox. An internet search was used to locate the website of the organization or program and to match the identified organization with food and agricultural education programs they deliver, or vice versa.

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