

# Examining the Status of Middle School Agricultural Education Programs in the United States

Shelby Jones<sup>1</sup>, William Doss<sup>2</sup>, and John Rayfield<sup>3</sup>

## Abstract

*Middle school is an important time in the development of agricultural education students and plays an important role in increasing agricultural literacy in our society. The theoretical framework of this study was based upon Piaget's cognitive development theory and the importance of introducing agricultural topics to students at the appropriate age to facilitate continued growth and development in the subject. The purpose of this study was to examine the status of middle school agricultural education programs in the United States and describe any changes in the past 25 years. Findings from this study revealed an increase in middle school agricultural education enrollment and FFA membership and state FFA leaders viewed middle school agricultural education as a positive aspect in agricultural education leading to possible increases in high school agricultural education enrollment. Further research concerning appropriate length of middle school agricultural programs and middle school supervised agricultural experiences should be conducted. Recommendations for practice include developing standards for middle school agriculture courses and adding state funding for additional middle school programs across the nation.*

**Keywords:** middle school; enrollment

## Introduction

Middle school agricultural education is valuable in schools today (Hadsock, 2009). Rossetti (1992) stated there were 1,547 schools with middle school agricultural education programs in the United States and 52,968 students were enrolled in those programs. However, there is sparse modern literature on the subject of middle school agricultural education enrollment. Middle schools are defined in multiple ways and include different grade levels nationwide. It is up to local districts to determine what grades form middle school; however, middle school or junior high is most commonly defined as grades six through eight. Middle schools are a completely separate division of education due to the disposition of their students. "Middle schools possess neither the characteristics of an elementary school nor those of a high school, and yet are charged with the responsibility of paving a smooth path for students to transition successfully from elementary to high school" (Rayfield & Croom, 2010, p. 131). Young people experience more profound changes between the ages of 10 and 15 than at any other time in their life (National Middle School Association, 2003). Fundamentally, middle school students go through developmental changes physically, emotionally, and socially, all of which can affect their educational experience.

<sup>1</sup> Shelby Jones is a teacher at Brazoswood High School in Brazosport ISD, 302 West Brazoswood Drive, Clute, TX 77531, [Shelby.Jones@brazosportisd.net](mailto:Shelby.Jones@brazosportisd.net).

<sup>2</sup> William Doss is a doctoral graduate assistant in Agricultural Education in the Department of Agricultural Education and Communications at Texas Tech University, Box 42131, Lubbock, TX 79409-2131, [William.Doss@ttu.edu](mailto:William.Doss@ttu.edu).

<sup>3</sup> John Rayfield is an Associate Professor of Agricultural Education in the Department of Agricultural Education and Communications at Texas Tech University, Box 42131, Lubbock, TX 79409-2131, [John.Rayfield@ttu.edu](mailto:John.Rayfield@ttu.edu).

According to Erikson's (1968) Social-Emotional Development theory, there are eight stages to discovering adulthood and self-identity. The stages specific to middle school children are industry vs. inferiority (ages 10 to 11) and identity vs. role confusion (ages 12 to 15) (Caskey & Anfara, 2007). Much like Piaget's cognitive development theory, middle school students enter this period of education in one stage and leave in another (Rayfield & Croom, 2010). Middle school is the place for transition and development. In stage five of Erikson's theory, students feel the need to develop a unique identity (Rayfield & Croom, 2010). In early adolescence, students are more interested in real life experiences and authentic learning opportunities (Caskey & Anfara, 2007; Kellough & Kellough, 2008). In addition, it has also been noted middle grades are the time for heightened awareness of adulthood and career possibilities, making middle school the optimum time to inspire students to learn (Anderman & Maehr, 1994; Faulkner et al., 2006).

According to Fritz and Moody (1997), 97% of the U.S. citizens do not live on a farm or are not involved in production agriculture. With students further removed from a production agriculture experience, it is important to expose middle school students to agriculture and increase agricultural awareness and literacy for the future of the United States. "With agriculture being the largest employer in the world, it seems unfathomable to not include this area in a middle school curriculum" (Schwartz, 2009, p. ii). This leads to an issue our society faces today, agricultural literacy (Gibbs, 2005). Agricultural literacy can be defined as being able to understand the food and fiber system, including its history and current economic, social, and environmental significance (Rossetti & McCaslin, 1994). To address this issue, many states have implemented agricultural programs for elementary and secondary schools. According to Camp et al. (2002), 573 teachers in the United States teach middle school agricultural science exclusively. These programs are extremely vital for agricultural literacy because only 4.5% of high school students enroll in agriculture education classes (Terry et al., 1992). "Agriculture is too important a topic to be taught only to the relatively small percentage of students considering careers in agriculture and pursuing vocational agriculture studies" (National Research Council, 1988, p. 1; Terry et al., 1992, p. 51).

Currently, agricultural education is most popular in grades 9-12. However, with the increase of students who are further removed from the agricultural industry, more emphasis has been placed on agricultural programs and activities for middle school and elementary students. According to Phipps and Osborne (1988), over 22 % of all secondary agriculture instructors taught one or more middle school courses in agriculture in 1985. It is believed middle school agricultural education programs can contribute to growth in FFA membership and serve as recruitment for high school programs. Rayfield and Croom (2010) suggest students who take middle school agricultural science may be more likely to continue enrollment in high school agricultural education. In addition, middle school agricultural education programs may spark an interest for some students who had not previously planned on studying agriculture (Luft, 1990). It has been reported that students who enroll in middle school agricultural education have a better understanding of agriculture and are more informed about occupations in agriculture than those who did not enroll, highlighting the importance of middle school agricultural education programs (Rossetti & McCaslin, 1994).

According to Rich et al. (2009), Georgia middle schools with agricultural education programs had higher percentages of students meeting the standards on the CRCT science test than middle schools without agricultural education programs. Also, involvement in middle school agriculture education can be beneficial for supervised agricultural experience (SAE) purposes. Students can begin their experience in middle school and blend it into a high school experience.

A concern Rossetti (1992) reported was middle school agricultural education teachers feel students burn-out on agricultural education in middle school and do not enroll in high school. State FFA executive secretaries also thought middle school programs could increase student to teacher ratio, and could decrease participation in upper grades (Rossetti, 1992). Additional disadvantages reported by Rossetti (1992) were students could have a bad experience due to teachers lacking preparation to

teach middle school students, the potential of duplication courses with secondary courses, and increased competition with other elective courses. A concern voiced by Rayfield and Croom (2010) was middle school agricultural education teachers in North Carolina felt there should be more recognition at the regional and state level for middle school FFA accomplishments.

Middle school agricultural education programs have been officially recognized since 1988. "In 1988, the National FFA Organization made a change to their constitution to allow middle school student FFA membership" (Golden et al., 2014, p. 222). Many of these programs were created due to decreasing enrollment numbers in agricultural science classes in the early 1990s (Rossetti, 1992). According to Rayfield and Croom (2007), middle school programs could help increase FFA membership numbers. The establishment of middle school agricultural education programs is notable because investing in students during this stage of development can have serious and lasting effects on shaping their career choices. "Many students make their first decisions about career options in middle school or junior high school, when they choose courses that will help prepare them for a cluster of career choices" (National Research Council, 1988, p. 22).

Often middle school agricultural education programs are the initial point of contact for introducing students to agricultural literacy and career exploration. We know middle school agricultural education is distinctly different than high school agricultural education (Talbert et al., 2007). However, little research has been conducted to examine middle school agricultural education. This study examined the status of middle school agricultural education in the United States in an attempt to update the profession on its contribution to agricultural education as a whole.

### **Theoretical Framework**

The theoretical framework of this study was based upon Piaget's cognitive development theory. Piaget (1950) identified four stages of cognitive development. These stages are 1) Sensorimotor, 2) Preoperational, 3) Concrete operational, and 4) Formal operational. Huitt and Hummel (2003) define the stages as follows:

Sensorimotor - (Infancy). In this period (which has 6 stages), intelligence is demonstrated through motor activity without the use of symbols. Knowledge of the world is limited (but developing) because it's based on physical interactions / experiences. Children acquire object permanence at about 7 months of age (memory). Physical development (mobility) allows the child to begin developing new intellectual abilities. Some symbolic (language) abilities are developed at the end of this stage. (para. 10)

Preoperational - (Toddler and Early Childhood). In this period (which has two substages), intelligence is demonstrated through the use of symbols, language use matures, and memory and imagination are developed, but thinking is done in a nonlogical, nonreversible manner. Egocentric thinking predominates. (para. 11)

Concrete operational - (Elementary and early adolescence). In this stage (characterized by 7 types of conservation: number, length, liquid, mass, weight, area, volume), intelligence is demonstrated through logical and systematic manipulation of symbols related to concrete objects. Operational thinking develops (mental actions that are reversible). Egocentric thought diminishes. (para. 12)

Formal operational - (Adolescence and adulthood). In this stage, intelligence is demonstrated through the logical use of symbols related to abstract concepts. Early in the period there is a return to egocentric thought. Only 35% of high school graduates in industrialized countries obtain formal operations; many people do not think formally during adulthood. (para. 13)

Students enter middle school at the concrete operational stage at ages 7-12 and are transitioning to the formal operation stage at age 12 and older (Rappa, 2012). While students are in the concrete

operational stage, abstraction is difficult to understand (Garlick, 2010). One of the most difficult experiences for teaching early adolescents is helping them transition from concrete to formal operations during the middle school years (Brown & Canniff, 2007). The National Middle School Association (2003) recommended teachers implement concrete experiential learning experiences in order to help students develop better intellectually. According to Piaget (1960), young adolescent learners build upon prior learning and experiences, therefore, students need concrete concepts in order to ensure understanding and comprehension.

During their time in middle school, students are assisted in transitioning into the formal operational stage, where they will function the rest of their adult lives (Rappa, 2012). “Understanding the developmental stages of these young people can help educators develop programs better suited to meet their unique needs” (Rappa, 2012, p. 29). However, what makes middle school so different from any other level of education is students grow and develop physically, emotionally, and socially all at different rates and times (Lounsbury & Vars, 2003). Physically, middle school students undergo more growth than they have since infancy (Eichhorn, 1966). Middle school classes could include men, women, girls, boys, and everything in between (Lounsbury & Vars, 2003). Surging hormones and rapid physical development can lead to teens feeling uncomfortable in their own skin which in turn can trigger emotional development in these students (Golden, 2013). These changes result in self-confidence issues that can negatively impact the student’s ability to apply themselves academically (Chung, Elias & Schneider, 1998; Rappa, 2012). Teachers seek to develop curricula that helps build students’ self-esteem. (Caskey & An fara, 2007). Therefore, middle school agricultural science teachers should pay particular attention to helping build self-concept in their students at this unique stage of development. According to Luft and Armenta (1994), “the design of agricultural education program provides an excellent means of building self-concept” (p. 4).

Understanding the development of middle school students is especially important for agricultural educators who teach this level due to the fact that the concrete operational stage is the beginning of logical and systematic thinking which lends itself to many FFA activities and SAE exploration. On the other hand, the formal operational stage is when students begin to think formally and formulate ideas about potential career or higher education paths. Guiding agricultural education students through this time is important for the development of their skills in the field of agriculture when they advance to high school. To determine if opportunities are being provided to students in the concrete operational stage through agricultural education activities, an examination of current middle school agricultural education practices must be made.

### **Purpose and Objectives**

Given the information on the development of agricultural education students in middle school and the need to educate students at this level, this study was designed to explore the current status of middle school agricultural education across the nation. The purpose of this study was to examine the status of middle school agricultural education programs in the United States and describe any changes in the past ≈25 years. The research objectives that guided this study were:

1. Describe basic information related to middle school agricultural education (enrollment numbers, number of schools with middle school agricultural education, length of programs, number of middle schools with FFA, dues and funding).
2. Describe components of middle school agricultural education programs (topics taught, participation in FFA contests, opportunities for students, and involvement with SAE).
3. Identify advantages and disadvantages of middle school agricultural education programs as perceived by state FFA leaders.

## Methods

To provide an update on the status of middle school agricultural education in the United States and accomplish the research objectives for this investigation a descriptive, cross-sectional study was conducted. According to Fraenkel et al. (2015), descriptive research design is used to explain the current status of a specific variable and “describes a given state of affairs as fully and carefully as possible” (p. 15). A census of all state FFA leaders in all 50 states and Puerto Rico ( $N = 51$ ) was conducted using an online survey administered through Qualtrics™ as the data collection method. State FFA leaders were selected as the subjects due to their involvement and access to enrollment numbers and other baseline information. State FFA leaders are defined as either a state FFA advisor, executive secretary/director, or an employee of the department of education who is an agricultural education specialist.

The survey was developed by a panel of teacher educators as an adaptation from Rossetti’s (1992) instrument from “A Nationwide Examination of Middle School Enrollment in Agricultural Education and Membership in the National FFA Organization”. Rossetti was contacted via email and granted the researchers permission to modify and adapt her instrument for this study. The survey included questions addressing additional opportunities for middle school agricultural education students, while also using data collected by Rossetti initially. The instrument contained items divided into the following constructs: Schools, Students, Length of Program, FFA Membership, Curriculum, Contests, Funding, and Perception. There was a total of 34 questions on the survey including 12 multiple choice/ check all that apply questions, 16 fill in the blank questions, four Likert-type questions, and two questions regarding which state the respondent represented. Respondents were asked to answer questions addressing enrollment numbers, membership numbers, coursework, availability of contests, funding, advantages, and disadvantages related to middle school agricultural education in each state. Rossetti (1992) reported a panel of teacher educators determined the content validity of the instrument. A panel of experts in agricultural teacher education at Texas A&M University validated the modifications and additions to the instrument for this study. Reliability was analyzed and calculated post hoc for the Likert-type questions and an acceptable reliability score of .66 was calculated using Cronbach’s Alpha. According to Nunnally (1978), in the early stages of research and through instrument development, it may be acceptable to have only modest reliability, defined as 0.60-0.70.

This study used Dillman et al.’s (2014) tailored design method for data collection using five points of contact. State FFA leader email addresses were obtained from each state’s FFA website. All emails were sent to those addresses. The first contact was a pre-notice email that asked for their participation, explained procedures of the study, and provided a short description of the study. The survey link was sent out via Qualtrics™ three business days following the recruitment email. Follow up emails were sent out once a week for the next four weeks in order to encourage responses. Dillman et al. (2014) recommended using multiple contacts and to vary the messages used in each email to increase response rate. There were 51 state FFA leaders invited to participate in this study. A response rate of 84% ( $n = 43$ ) was achieved.

The data collected from the survey was analyzed using Statistical Package for Social Sciences (SPSS) version 25.0 and Microsoft Excel. Percentages and frequencies were calculated for multiple choice questions, while means and standard deviations were calculated for each of the Likert type questions. For open-ended questions, responses were compiled and frequencies were determined.

## Findings

The first objective of this study was to describe basic information related to middle school agricultural education. State FFA leaders reported 442 teachers exclusively teach middle school agricultural education. Agricultural education program prevalence was determined by asking the state

FFA leaders if there were middle school agricultural education programs in their state. Out of the 43 states responding, a total of 32 states (74%) reported having middle school agricultural education programs, while 11 states (26%) reported they did not have any middle school agricultural education programs. Concerning FFA membership, out of the 32 states with middle school agricultural education programs, 27 states (84%) reported having official FFA membership for middle school students. Overall, respondents reported a total of 1,230 schools offered official FFA membership to middle school students. The top five states for reported middle school agricultural education enrollment and top five states for middle school FFA membership is presented in Table 1. Of the total 107,856 students enrolled in middle school agricultural education classes, 29,395 (27%) were official FFA members.

**Table 1***Top Five States by Reported Enrollment and FFA Membership Numbers*

State	Students
<b>Enrollment</b>	
Georgia	30,458
Florida	17,394
Virginia	13,814
Missouri	13,167
Delaware	6,097
<b>FFA Membership</b>	
Georgia	9,284
Florida	6,414
Oklahoma	4,643
Virginia	2,510
Wisconsin	2,408

Eight states (25%) reported enrollment in 6<sup>th</sup> grade, 23 (72 %) states reported enrollment in the 7<sup>th</sup> grade, and 24 states (75%) reported enrollment in the 8<sup>th</sup> grade. A complete summary of middle school enrollment data and FFA membership is present in Table 2.

**Table 2***Middle School Enrollment and FFA Membership by Grade Level (n = 32)*

Grade Level	Schools with Agricultural Education	Agricultural Education Enrollment	FFA Membership
6 <sup>th</sup>	389	24,865	5,430
7 <sup>th</sup>	945	31,917	8,408
8 <sup>th</sup>	1,550	51,074	15,557

To describe the length of time middle school agricultural education students spend in agricultural education programs, the 32 state FFA leaders with middle school agricultural education programs were asked to indicate the typical length of their state's agricultural education programs by selecting all that apply from the following options: 6 weeks, 9 weeks, one semester, one full school year, and other. The majority of respondents checked one semester ( $f = 18$ ) or nine weeks ( $f = 16$ ). Additionally, two respondents selected other and indicated their programs were 12 weeks or 18 weeks. One respondent did not respond to this item. Refer to Table 3 for the complete list of frequencies reported.

**Table 3***Typical Length of Middle School Agricultural Education Programs (n = 31)*

Length of Program	<i>f</i>	%
6 Weeks	9	29.03
9 Weeks	16	51.61
One Semester	18	58.06
One Full School Year	15	48.39
Other	2	6.45

*Note.* Respondents could check all that applied. Some states could have multiple program lengths. Percentage indicates percent of total states with the particular program length.

The final part of the first research objective sought to determine how middle school agricultural education programs are funded. State FFA leaders were asked if they require FFA dues for middle school FFA members. 25 (78%) state FFA leaders reported they collect dues from middle school FFA members and seven states (22%) reported they do not collect dues. The cost of dues ranged from \$5 to \$17. The 32 state FFA leaders were asked to indicate the type of funding used to finance their middle school programs. Respondents could select all that apply out of the following choices: federal funds, state funds, local funds, and other. Eight states reported using federal funds, 19 states reported using state funds, 28 states reported using local funds, and four states reported other. State FFA leaders that indicated other specified by reporting students conduct fundraisers to help cover dues/or costs. Two state FFA leaders did not respond to this item.

The second objective of this study was to describe components of middle school agricultural education programs in the areas of FFA chapter organization, curriculum, state level CDE participation, and opportunities offered to students. Out of the 32 states with middle school agricultural education programs, nine (28%) of the state FFA leaders indicated middle school FFA chapters are organized separately from the high school chapter. Ten state FFA leaders (31%) reported chapters are joint chapters between the middle school and the high school, while 13 states (41%) indicated other. State FFA leaders who selected other indicated they “do not have middle school chapters”, “have both joint and separate chapters”, or “if the middle school is located on a different campus, then the chapter must be a separate charter from the high school”. A complete list of frequencies for FFA chapter organization is presented in Table 4.

**Table 4***Organization of Middle School FFA Chapters (n = 32)*

Chapter Organization	<i>f</i>	%
Separate Chapter from High School FFA	9	28.00
Joint Chapter with High School FFA	10	31.00
Other	13	41.00

To determine what is currently taught to middle school agricultural education students, state FFA leaders were asked to report if their state had curriculum or standards for their middle school agricultural science courses. Out of the 32 states with middle school agricultural education programs, thirteen (41%) states reported having standards and 19 (59%) states said they did not have standards for their middle school agricultural education courses. If they did have standards for their courses, respondents were asked what standards were used. Respondents indicated they used state standards specific to their courses in their state. The 32 state FFA leaders were also asked to check what topics were covered in their agricultural science courses. The most frequent topics addressed were career exploration ( $f = 28$ ), agricultural literacy ( $f = 26$ ), animal science ( $f = 25$ ), horticulture ( $f = 24$ ) and

history of the FFA ( $f = 24$ ). Three state FFA leaders did not respond to this item. A complete list of reported topics covered is presented in Table 5.

**Table 5**

*Topics Taught in Middle School Agricultural Education Courses (n = 29)*

Topics	<i>f</i>	%
Career Exploration	28	96.55
Agricultural Literacy	26	89.66
Animal Science	25	86.21
Horticulture	24	82.76
History of FFA	24	82.76
Agricultural Mechanics	19	65.52
FFA Meeting Procedures	19	65.52
Ecology Conservation	19	65.52
Soil and Crop Science	18	62.07
Public Speaking	18	62.07
Agribusiness	15	51.72
Employability Skills	13	44.83
Parliamentary Procedures	11	37.93
International Agriculture	7	24.14

*Note.* Respondents could check all that applied. States could have multiple courses taught. Percentage indicates percent of total states that teach the particular course.

Concerning middle school state level CDE participation, out of the 32 states with middle school agricultural education programs, 22 states (69%) indicated they hold state level contests for middle school FFA members while 10 states (31%) reported they do not hold state level contests for middle school FFA members. These 22 states were then asked to report how they hold their CDE contests. The 22 respondents could check all that apply from the following list: in conjunction with high school FFA events, separate from high school FFA events, and other. Five states reported they hold middle school CDEs separate from high school CDE events, while 21 reported middle school CDEs are held in conjunction with high school FFA events. Five states also indicated other and then specified. State FFA leaders who reported other indicated these events happen at their state convention, both in conjunction and separate from high school events, and at the same time, but as a separate competition. A complete list of how CDEs for middle school programs are organized is presented in Table 6. Additionally, the 22 state FFA leaders were asked what grades levels can participate in state level CDEs. Eight states reported 6<sup>th</sup> graders participate in CDEs, 19 states reported 7<sup>th</sup> graders participate in CDEs, and 22 states reported 8<sup>th</sup> graders participate in CDEs.

**Table 6**

*Organization of Middle State Level CDEs (n = 22)*

CDE Organization	<i>f</i>	%
In Conjunction with High School FFA Events	21	95.45
Separate from High School FFA Events	5	22.72
Other	5	22.72

*Note.* Respondents could check all that applied. Some states could have multiple ways of organizing middle school CDEs. Percentage indicates percent of total states with the particular CDE organization.

The final part of research objective two sought to determine opportunities available for middle school agricultural education students. State FFA leaders were asked if middle school students participated in SAEs. Of the 32 participating states, 24 (75%) reported students in middle school

agricultural science courses participate in SAEs while, eight states (25%) reported they do not participate in SAE projects. Additionally, respondents were asked to check all other opportunities that were available for middle school FFA members. This information is presented in Table 7. The opportunities selected most frequently were discovery degree ( $f = 26$ ), attend conventions ( $f = 25$ ), creed speaking ( $f = 23$ ), public speaking contests ( $f = 20$ ), record books ( $f = 19$ ) and state awards ( $f = 19$ ). Other opportunities not listed but reported by state FFA leaders were “middle school opening and closing ceremonies; essay contest”, “leadership conferences presented by state officers tailored to 6<sup>th</sup>-8<sup>th</sup> graders”, and “junior high conduct of meeting contest, environmental skills contest, soils judging contest, dairy foods contest, floriculture contest, poultry judging, and broiler contest”. Four state FFA leaders did not provide a response.

**Table 7**

*Opportunities for Middle School Agricultural Education Students (n = 28)*

Opportunity	<i>f</i>	%
Discovery Degree	26	92.86
FFA Officer Team	12	42.86
Attend Conventions	25	89.29
Proficiency Awards	8	28.57
National FFA Awards	12	42.86
State FFA Awards	19	67.86
Public Speaking Contests	20	71.43
Creed Speaking	23	82.14
FFA Quiz	18	64.29
Record Books	19	67.86
Livestock Evaluation	16	57.14

*Note.* Respondents could check all that applied. Some states could have multiple opportunities for middle school. Percentage indicates percent of total states with the particular opportunity.

The third objective of this study was to identify advantages and disadvantages of middle school agricultural education programs as perceived by state FFA leaders. To determine advantages and disadvantages for students enrolled in middle school agricultural education programs, the 32 state FFA leaders with middle school agricultural education programs were asked to rate their level of agreement with each of nine statements using a Likert scale of 1-4 (1= Strongly Disagree, 2= Disagree, 3= Agree, 4= Strongly Agree). State FFA leaders agreed the following were advantages to enrollment in middle school agricultural courses: increased agricultural literacy ( $M = 3.61$ ,  $SD = .50$ ), increased career awareness ( $M = 3.35$ ,  $SD = .49$ ), increased leadership development ( $M = 3.32$ ,  $SD = .75$ ), increased self-esteem ( $M = 3.39$ ,  $SD = .50$ ), and participation in FFA activities ( $M = 3.26$ ,  $SD = .82$ ). State FFA leaders were asked to add any additional positive outcomes for students who enrolled in an agricultural education course that were not listed in the Likert scale question. Many state FFA leaders indicated students were more likely to participate in high school programs if they were in middle school programs. One state FFA leader even reported it helps “develop positive professional relationship with instructor (who in most cases will be the same instructor in high school)”. Two state FFA leaders indicated a positive outcome was career development and can lead to career opportunities in agriculture. One state FFA leader reported a positive outcome for students who enroll in middle school agricultural education courses is “an interest in science through participation in Agriscience Fair”.

State FFA leaders were also asked to report disadvantages for students who enrolled in middle school agricultural education programs. State FFA leaders neither agreed nor disagreed with all of the statements. Additionally, state FFA leaders were asked to report other disadvantages for students that were not listed in the question. Three state FFA leaders reported time was an issue. Nine-week courses limit involvement with FFA and results in a disconnect with students and teachers. State FFA leaders

also reported there is limited opportunities for middle school students. One state FFA leader reported middle school enrollment “lowers local 4-H membership”. A summary of state FFA leader agreement with advantages and disadvantages for students enrolled in middle school agricultural education programs is presented in Table 8.

**Table 8***Advantages and Disadvantages for Students Enrolled in Middle School Programs (n = 31)*

Outcome Statements for Students	<i>M</i>	<i>SD</i>
Advantages		
Increased agricultural literacy	3.61	.50
Increased self-esteem	3.39	.50
Increased career awareness	3.35	.49
Increased leadership development	3.32	.75
Participation in FFA activities	3.26	.82
Disadvantages		
Teacher lacks preparation to teach students	2.45	.85
Increased competition with other courses	2.35	.80
Potential duplication with high school courses	2.26	.89
Student burn out in agricultural education	2.19	.65

*Note:* 1= Strongly Disagree, 2= Disagree, 3= Agree, 4= Strongly Agree

Additionally, state FFA leaders were asked to rate their level of agreement with positive and negative aspects on the state level of having students in middle school agricultural education programs. State FFA leaders generally agreed with positive statements and slightly disagreed with negative statements. Table 9 shows a complete breakdown of state FFA leader perceived advantages and disadvantages to having middle school agricultural education programs.

**Table 9***Advantages and Disadvantages to the State with Middle School Programs (n = 31)*

Outcomes for the State	<i>M</i>	<i>SD</i>
Advantages		
Increased agricultural literacy in society	3.41	.56
Increased enrollment in agricultural education	3.34	.60
Increased FFA membership	3.25	.76
Increased student accomplishment at earlier grade levels	3.16	.68
Disadvantages		
There are not any disadvantages	2.74	.77
Increased student to teacher ratio	2.34	.67
Reduced agricultural participation in upper grades	1.93	.59

*Note:* 1= Strongly Disagree, 2= Disagree, 3= Agree, 4= Strongly Agree

Some other benefits reported include allowing an agricultural educator to have a full teaching load at a small school, helps recruit students into a high school program, higher level of achievement in high school FFA, better scores on state tests, and increased in participation in the Agriscience Fair. Other disadvantages state FFA leaders reported included finding teachers to teach in middle school programs with an already growing agricultural teacher shortage, working through the age differences of middle school and high school FFA members, and finding a way to offer more opportunities to these middle school students.

### **Conclusions, Implications, and Recommendations**

Based on the results of this study, several conclusions, implications, and recommendations can be made about middle school agricultural education programs in the United States. In this study, a total of 32 states reported they had middle school agricultural education programs in their state. After comparing data from this study to that of Rossetti (1992), the researchers concluded enrollment numbers in middle school agricultural education programs have more than doubled. The number of states that have middle school agricultural education programs has increased as well. This means middle school agricultural education programs are a growing population in the field of agricultural education and could have implications for students in the concrete operational stage and help with further development. For agricultural education teachers, this could result in more enrollment in their programs and potentially a more successful and well-rounded program. Students now have more years to be involved in agricultural education and this should result in more opportunities available and higher achievement in the agriculture field. After being enrolled in a middle school agricultural program, students should come to high school knowing the basics of agriculture and FFA and should be able to accelerate through curriculum quicker, possibly resulting in the entry into Piaget's formal operational stage more quickly. This could also result in students taking higher level agricultural education courses that normally would not be able to be taken in just four years of agricultural education. With more middle school students taking agricultural education courses, we are addressing the issue of today's students being further removed from a production agriculture experience, thus helping create a more agriculturally literate society as expressed by Fritz and Moody (1997).

In this study 27 (84%) states reported having official FFA membership available for middle school students, while Rossetti (1992) reported only 19 states had FFA members at the middle school level. It can be concluded middle school FFA membership has seen an increase in the past 25 years, however, compared to the enrollment increase it is at a slower rate. Why are more students enrolling middle school agricultural education courses, but not joining FFA? This could be due to the lack of chapters and/or states allowing middle school FFA members. Based on these findings, only 27% of students enrolled in middle school agricultural education courses were official FFA members. This is problematic for agricultural education teachers because FFA is an intracurricular piece of the three components of agricultural education (Talbert, Vaughn, Croom & Lee, 2007). How can middle school agricultural education teachers provide a quality program for their students without being involved in FFA?

State FFA leaders indicated the typical middle school program length was one semester, or 9 weeks. However, due to local school differences, the length of programs can vary greatly so it is important to determine which program lengths are most popular and best fit middle school students. This creates a need for agricultural education teacher preparation programs to prepare teachers to teach courses of various lengths. There is also a need to determine which length of middle school agricultural education program best prepares students for a high school experience in agricultural education.

Concerning middle school FFA dues, it can be concluded dues have increased for middle school FFA members in the past 25 years. Middle school agricultural education programs were funded either federally, through the state, through local funds, or a combination of these. While funding for middle school programs is often from a mixture of sources, it has continued to be funded mainly at the local level. More funding is necessary in order to increase the number of middle school agricultural education programs. Based on these findings, local school administrators can understand most middle school agricultural education programs are funded locally and without local funds, most programs would not be able to survive. Administrators should continue to ensure funding is available each year in order to continue middle school agricultural education programs. In order to increase the size of their programs, middle school agricultural education teachers should begin to seek funds from other sources

rather than just relying on local funding. Departments of education at the state level should consider proposing legislation to approve funding for middle school agricultural education programs.

From the results of the second research objective, 31% of states have joint FFA chapters between their middle school and high school. This means the middle school program could be a feeder program for the high school. For agricultural education teachers, it is important the middle school teacher and high school teacher have a good working relationship for better success of the program. Middle school students could attend meetings alongside high school students, creating a sense of community in the chapter, even though they are in two separate schools. Joint participation of middle school and high school FFA meetings could also help bridge the gap between students in Piaget's concrete operational stage and formal operational stage.

Additionally, 28% of states reported having separate chapters for their middle school and high school. The question is, why? Why are chapters separate and does this make it a more difficult transition from middle school to high school? Which organization of chapters works best for students and teachers? These questions warrant additional inquiry.

The most frequent topics addressed in middle school agricultural education curriculum were career exploration, agricultural literacy, animal science, horticulture, and history of the FFA. Rossetti (1992) reported the most frequent topics addressed were plant science, career exploration, agricultural literacy, animal science, conservation, and mathematics. It can be concluded career exploration, agriculture literacy, animal science and horticulture are still the foundation of these courses. Additionally, it can be concluded the history of FFA is now addressed more in middle school agricultural education courses than it was twenty-five years ago. Based on these findings the researchers concluded middle school programs are addressing the issue of students being further removed from production agriculture (Fritz & Moody, 1997). Agricultural literacy is addressed by 90% of programs. Additionally, 97% of the programs explore career paths. According to Anderman and Maehr (1994), middle grades are the time for heightened awareness of career possibilities. This should excite local school administrators because middle school agricultural education programs are addressing issues in today's society and also assisting students in possible career exploration, which is appropriate for this stage of development (Anderman & Maehr, 1994). These findings suggest middle school agricultural education teachers should be prepared to teach a variety of topics with an emphasis on career exploration, agricultural literacy, animal science, horticulture, and history of FFA.

From the results of this study, it can be concluded more states are providing state level CDE contests for middle school FFA members compared to those reported in 1992. The majority of states still hold their middle school state CDEs in conjunction with high school CDE contests. Additionally, participation at the middle school level in CDEs is still highest with 8<sup>th</sup> graders, but 6<sup>th</sup> and 7<sup>th</sup> grade participation has increased over the past 25 years. If middle school students are allowed to participate in state level CDE contests, it allows students to start training in contests at a younger age and will likely result in a higher level of achievement in high school CDE contests.

It can be concluded there are a wide variety of opportunities available for middle school students. Based on these findings, the majority of middle school students participate in SAEs. This is great for students because this allows for potentially more investment and a longer, more extensive SAE record book, which could lead to greater experiential learning, awards, and scholarships. Due to the high level of SAE participation, state FFA leaders should consider having proficiency awards for middle school FFA members. However, what type of SAEs are middle school students completing?

State leaders agreed positive outcomes for students were the following: increased agricultural literacy, career awareness, self-esteem, leadership development, and participation in FFA activities. Rossetti (1992) reported 12 states indicated a positive outcome for students was improved agricultural

literacy. It is clear this still rings true in today's programs, supporting the work of Frick (1993). Additionally, Rossetti (1992) also reported FFA leaders felt career awareness was a benefit, which continues in today's programs. Rossetti (1992) reported the following middle school agricultural education disadvantages: teachers are not prepared to teach middle school students, duplication of course work in high school, competition with other courses, and student burn-out. Today's state FFA leaders reported some additional disadvantages. Three state FFA leaders reported there is not enough time in courses to increase involvement with FFA. State FFA leaders also reported there is limited opportunities for middle school agricultural education students and involvement may lower local 4-H membership. The researchers concluded that over the past 25 years some disadvantages for students enrolling in middle school agricultural education programs have been resolved, while other problems have surfaced.

Based on the findings, today's state FFA leaders still feel the state has a more agriculturally literate society due to middle school agricultural education programs, reflecting the findings of Rossetti (1992). Today's state FFA leaders also indicated middle school agricultural education programs allow a teacher to have a full teaching load at a small school, help recruit students into a high school program, result in a higher level of achievement in high school FFA, help scores on state tests, and increase participation in agriscience fair. Rayfield and Croom (2007) reported middle school programs could help increase enrollment numbers. Based on these findings, it is clear state FFA leaders agree. State FFA leaders indicated high school enrollment mainly depends upon the quality of the teacher and the quality of the middle school agricultural education programs. To enhance enrollment in high school agricultural education programs, teachers and local administrators should make sure there is a high-quality teacher at the middle school level. The findings of this study highlight the impact middle school programs could have on a state's enrollment numbers. In 1992, Rossetti reported 11 state FFA leaders felt there were not any disadvantages for having middle school agricultural education on the state level. Others thought programs could not retain students in upper grades and there would be an increased student to teacher ratio. Today's state FFA leaders reported other disadvantages states experience due to middle school agricultural programs. These include finding teachers for middle school programs with an already increasing agricultural teacher shortage, working through the age differences of middle school and high school students, and finding a way to offer more opportunities for these students.

The results of this study provide several opportunities for further research within the field of middle school agricultural education. An investigation should be conducted regarding the growth of enrollment to understand why there has been such a rapid enrollment increase in middle school agricultural education programs. Furthermore, research should determine why middle school FFA membership has not grown at the same rate as enrollment. Further research could be conducted regarding agricultural education teacher preparation programs to determine if they prepare preservice teachers to teach middle school students. Another area of research could address the question: Do middle school programs really increase student's agricultural literacy and career awareness? Further research could be conducted regarding SAE projects. What SAEs are middle school students completing? How do these SAE projects affect their SAE projects in high school? More research should be conducted regarding state level CDEs for middle school students. Based on this study's findings, more 6<sup>th</sup> and 7<sup>th</sup> graders are participating in CDE contests. It is necessary to examine which CDEs this might include and how they might differ from high school CDEs.

This study also has the opportunity for replication by contacting middle school and high school teachers regarding perceptions of middle school agricultural education. Do teachers hold the same perceptions as the state leaders? With middle school involvement with FFA, SAE, and classroom instruction, is the three-circle model of agricultural education relevant or essential to middle school agricultural education? Could it be modified to fit middle school students better? These are all questions that warrant further research in middle school agricultural education. When examining middle school

agricultural education through the lens of Piaget's developmental stages, does enrollment in agricultural education and participation in FFA and SAE activities at an earlier age allow students to progress to the formal operational stage more quickly?

Recommendations for practice include developing standards and curriculum for middle school agricultural education programs in each state to help assist middle school agricultural education teachers. The researchers also recommend agricultural education teacher preparation programs prepare teachers to teach middle school age children as well as teaching courses of various lengths. Additionally, it is recommended each state FFA association, along with the National FFA Organization, create more contests and opportunities for middle school students. In this study it was apparent more opportunities were necessary in order to continue to increase enrollment and involvement of middle school members. The researchers recommend a national CDE be developed specifically for middle school students. This middle school CDE should be introductory to high school CDEs. For example, the National FFA Organization could have an opening ceremonies CDE for middle school members, which will teach students the skills of public speaking and lead to an introduction of parliamentary procedure. It is important to have a natural progression of cognitive skills through CDEs due to the developmental stage of middle school students. Lastly, with the large number of middle school students participating in SAEs, the researchers recommend proficiency awards be available exclusively for middle school students.

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