

PERCEPTIONS OF 4-H RECORD BOOKS AS PART OF THE EXPERIENTIAL
LEARNING CYCLE

by

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1. INTRODUCTION AND BACKGROUND	1
2. CONCEPTUAL FRAMEWORK.....	7
3. METHODOLOGY	12
4. DATA AND ANALYSIS.....	16
5. INTERPRETATION AND CONCLUSION	30
6. VALUE	32
REFERENCES CITED.....	36
APPENDICES	40
APPENDIX A Montana 4-H Record Book Forms	41
APPENDIX B MSU Institutional Review Board Exemption	62
APPENDIX C Inquiry-Based Learning Handout	64
APPENDIX D Reflection Interview Questions	67
APPENDIX E Observation Rubric	69
APPENDIX F Pre- and Post-Treatment Record Book Survey	71

LIST OF TABLES

1. Data Triangulation Matrix.....	16
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LIST OF FIGURES

1. Montana State University Extension Service Process	3
2. 4-H Record Book Binders	6
3. Kolb's Description of the Learning Cycle	9
4. 4-H Experiential Learning Model.....	10
5. Montana 4-H Record Book Form Page for Reflection	13
6. Overall Record Book Perceptions	17
7. Pre- and Post-Treatment Record Book Survey Results	20
8. Pre- and Post-Treatment Record Book Survey Results for 4-H Adult Members	22
9. Adult Perceptions of Reflection	23
10. Pre- and Post-Treatment Record Book Survey Results (Youth Only)	25
11. Youth Perceptions of Reflection	26
12. Youth Response to "I/we use record books monthly to record goals"	27
13. 4-H Adult and Youth Member Pre-Treatment Record Book Survey Responses	28
14. 4-H Adult and Youth Member Post-Treatment Record Book Survey Responses	29

ABSTRACT

This study investigated how perceptions of record books by 4-H adult and youth members changed before and after treatment, and if their perceived value of club meetings and project workshops, as well as growth in a project area improved after treatment. The subject of this treatment was enrolled Lewis and Clark County 4-H program members in Montana. Surveys were administered prior to record books being actively used in 4-H clubs and project workshops as a tool for goal-setting and reflection. Following volunteer training on how to effectively use record books in the Experiential Learning Cycle, club and project meetings were assessed on how effectively record books were incorporated, and subsequent remediation was made if necessary. If clubs and projects were evaluated to be using record books effectively, adult and youth members were asked to complete a post-treatment Record Book Survey. Pre- and post-treatment results were statistically analyzed and compared to qualitative interview findings, resulting in a significant increase in frequency of record book use, and modest increase of positive perceptions toward record book use and their relation to goal-setting and reflection, especially in youth members.

INTRODUCTION AND BACKGROUND

I work as a 4-H Youth Development Extension Agent in Lewis and Clark County, Montana. Population estimates as of 2017 for Lewis and Clark County was 67,773, with a 6.9% increase from 2010. Of this population, 21.5%, or 14,571 individuals were persons under 18 years of age (QuickFacts, 2017). Eighty-two percent of Lewis and Clark County's population lives in the greater Helena Area, with approximately 3,000 Jefferson County and 600 Broadwater County workers traveling to Helena to work each day. Based on the US cost of living average of 100, the cost of living in Lewis and Clark County is 105% in comparison to the overall Montana cost of living of 102.8%. Sixty-percent of the workforce in the Helena area is connected to state and government positions. There are twelve public elementary schools, three middle schools, and two high schools in the greater Helena Area, with an additional three private schools. Helena is also home to Helena College, a two-year college established in 1939, and Carroll College, a private, Catholic liberal art and pre-professional college founded in 1909. Helena hosts the Fort Harrison military base, contributing to the 1,056 active military members and 1,006 Army Reserve National Guard members in the Helena area (Helena Chamber of Commerce, 2017).

4-H is America's largest youth organization, comprised of approximately six million youth across the US in rural, urban, and suburban communities. 4-H is delivered by Cooperative Extension through over 100 public universities, utilizing Extension professionals and adult volunteers to guide youth in hands-on activities (National 4-H Council, 2018). The Smith-Lever Act of 1914 created Extension as part of the land-grant

system, and used “learning by doing” as a conceptual model to disseminate modern, research-based agricultural knowledge to rural areas and families (Figure 1). The youth outreach component of land-grant universities, the Cooperative Extension System, and the United States Department of Agriculture (USDA) became known as 4-H. The 4-H youth developmental program is one of the first youth-focused organizations utilizing non-formal education practices as a means to educate youth (Blyler, 2016). 4-H activities include health, science, agriculture, and citizenship subjects (National 4-H Council, 2018). 4-H provides opportunities for youth to work as partners in their own development, support their own growth, and achieve their potential (Small & Memmo, 2004).



Figure 1. Montana State University Extension Service process (“Montana State,” n.d.).

Lewis and Clark County is home to one of the largest 4-H programs in the state of Montana (Meghan Phillippi, personal communication, August 7, 2018). The 4-H year runs from October 1st to August 31st of the next year, with enrollment occurring from October 1st to May 1st. In the 4-H year of 2018-2019, 103 adult volunteers (Lewis and Clark Volunteers, 2019) and 450 youth members were enrolled in Lewis and Clark County 4-H. Of these youth members, 196 were male and 254 were female. Ages ranged from kindergarten to post high school, with 107 youth in the high school range (grades 9-12), 146 in the middle school range (grades 6-8), and 197 in the elementary range (grades

K-5). In identifying their place of residence, 243 youth identified as living in a town of 10,000-50,000, 72 identified as living in a rural, non-farm setting of less than 10,000 people, and 135 youth identified as living on a farm (Lewis and Clark Youth, 2019). Altogether, three percent of the county's population of persons under 18 years of age were enrolled in 4-H in the 2018-2019 4-H year (QuickFacts, 2017).

Although youth involved in 4-H projects have been engaged in science-related endeavors for years, the formal call to increase science programming has changed the face of 4-H programs across the country (Arnold, Bourdeau, & Nott, 2013). In addition to the agriculture programs for which it is known, 4-H in the 21st century offers programming in many other content areas, including astronomy, aviation, computer science, ecology, and plant science. 4-H youth development programs have expanded beyond the traditional club setting to include venues such as afterschool programs and summer camps (Enfield, 2001).

High-quality curriculum materials are critical for effective science education, both in and out of the traditional classroom. According to Tyler (1949) and Wiggins and McTighe (2005), curricula should be based on identified needs, include targeted learning objectives, organize content to build learning over time, be structured around effective approaches to teaching and learning, provide opportunities to evaluate outcomes, include explicit, real-world applications, and provide opportunities for focused reflection (as cited in Worker & Smith, 2014, p. 22). Because of the goal-setting and reflective nature of 4-H Record Books, a common 4-H staple, I believed they could be used as a tool to complete the experiential learning model, provide opportunity for focused reflection as part of

effective curricula, and improve the value and impact of current instructional activities at the club and project level.

4-H Record Books used to be referred to as Report Forms, and were more bureaucratic, a way to track members and their demographic information. Eventually, the Report Forms began to change into a tool of reflection. As described in a 1960s National 4-H Report Form Instruction Page, “Your 4-H record is an organized presentation of what you have learned and accomplished in 4-H. When properly kept and assembled, it is a useful tool for determining your own progress and personal growth” (Donehower, Hogg, & Schell, 2012, p.129) Eventually, these forms became known as Project Records, and began asking for goals in 1989. 4-H members were no longer inputting information into blank spaces of report forms, but began relying on directions provided by the organization and demonstrating how they achieved learning goals through skills-based projects. We now refer to these forms as a Record Book (Figure 2) (Donehower, Hogg, & Schell, 2012). Today, Record Book forms ask members to set goals, reflect on their learning, and record purchases made throughout the project, as seen in Appendix A.



Figure 2. 4-H Record Book binders (University of Maryland, n.d.).

The Lewis and Clark County 4-H Youth Development Extension Agent position has experienced a lot of turnover, with five individuals having taken and left the position over the last ten years (Dan Lucas, personal communication, August 9, 2018). This has contributed to a lack of continuity in policies, expectations, and procedures within the county 4-H (David Hamilton, personal communication, August 21, 2018). Despite the potential of Record Books as an effective assessment tool, record books were not utilized effectively, or at all, and volunteers struggled to describe why record books were meaningful. To address the poor perceptions of record books and their value among Lewis and Clark County 4-H youth members and adult volunteers, I created my focus statement: How do perceptions of record books before and after treatment change?

1. How do 4-H youth member perceptions of record books before and after treatment change?

2. How do 4-H volunteer perceptions of record books before and after treatment change?
3. Does the perceived value of club meetings and project workshops improve after treatment?
4. Does the perception of growth in a project area improve after treatment?

CONCEPTUAL FRAMEWORK

County-based 4-H programs are grounded in Cooperative Extension's mission and history related to agriculture, science, mechanical arts, and education. 4-H provides hands-on, experiential education opportunities to youth in all 50 states and the District of Columbia (USDA, 2003). The youth involved in 4-H programs are from 5 to 19 years old. There are various types of 4-H programs, including in-school programs, after-school programs, camping programs, teen-teacher programs, and 4-H clubs (Carver & Enfield, 2006). 4-H promotes positive youth development, involving programmatic strategies to help youth transition successfully to adulthood (National Research Council & Institute of Medicine, 2002). Positive youth development helps youth build skills and develop healthy relationships, both of which are necessary for youth to achieve desirable life goals (Lerner, Lerner, Lewin-Bizan, Bowers, Boyd, Mueller, & Napolitano, 2011).

Although John Dewey introduced the theory of experiential learning in 1938, a "learn by doing" approach has been used in 4-H since the early 1900s. The 4-H program has long held a belief that "youth learn best when they are actively involved in relevant, real world situations" (Carlson, 1998, p. 44). Projects, like those in the 4-H program, serve as an ideal setting for developing inquiry skills enabling better understanding of

personal assumptions and the consequences of our actions. Project-based learning is about using projects to set the stage for reflective practices and inquiry at all levels to benefit the individual, the organization, and society (Ayas & Zeniuk, 2001). In Dewey's model, learning involves making observations from an experience, reflecting on that experience, and then forming new ideas or concepts based on those reflections and pre-existing knowledge. True learning occurs through reflection, or the thinking and consideration of a subject or phenomenon in connection to past and future actions, along with application of the experience.

According to Joplin, all learning is experiential and can be described as a five-stage model. In addition, Joplin asserts experiential programs should be based on two components: providing an appropriate experience for the learner and facilitating reflection on that experience. An experience by itself is not enough to be called experiential learning or experiential education. The reflection process turns an experience into experiential learning. Joplin called this process the "action-reflection" cycle. This process is called a "cycle" because experiences are ongoing and are constantly building on previous experiences (Joplin, 1981). This model aligns with Dewey's theory that experiential learning is a "continuum" (Dewey, 1938).

Kolb (1984) believed experiential learning falls in line with constructivism, agreeing learners play an active role in creating their own knowledge, and that an experience is important in this knowledge creation process. Kolb identified a four-stage experiential learning cycle, with learning beginning with a concrete experience (Figure 1).

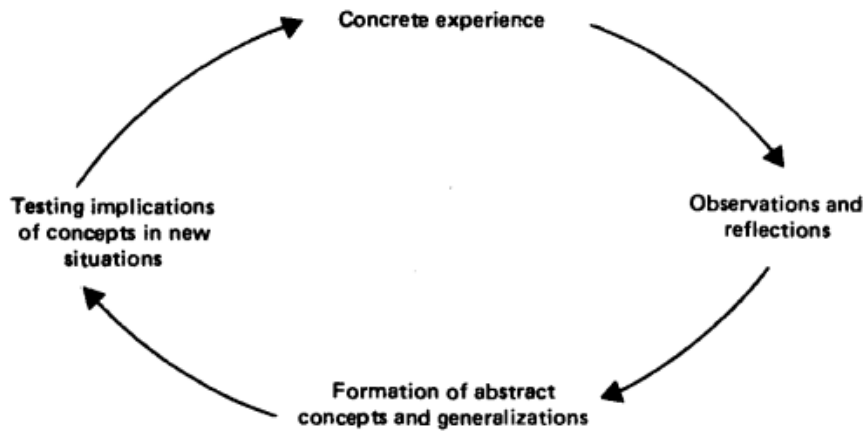


Figure 3. Kolb's description of the learning cycle (Kolb & Fry, 1975).

This is followed by reflective observation, which increases learning as people connect their experience to prior knowledge and plan their future actions. Next, the learners engage in abstract conceptualization, as they create or elaborate on theories that explain this and other experiences. Finally, learners plan and apply their learning in active experimentation.

4-H adopted the experiential learning model in the late 1970s (Carlson & Maxa, 1998) from models described by Kolb (1984) and Pfeiffer and Jones (1985). The five steps include experience, share, process, generalize, and apply (Figure 2).

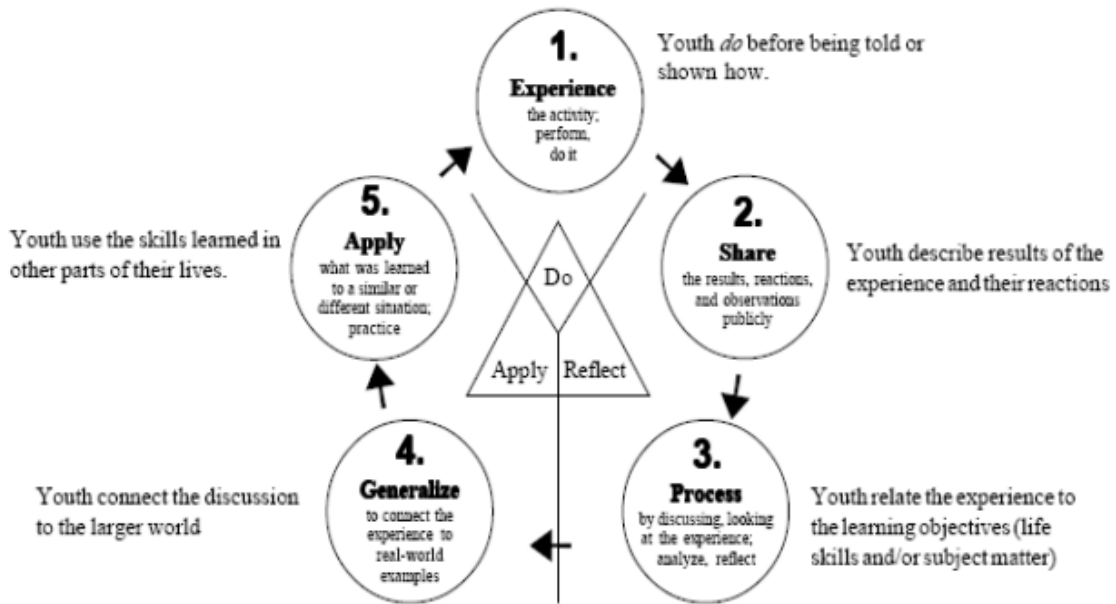


Figure 4. 4-H Experiential Learning Model (Blyler, 2016).

Planned reflection, either oral or written, is a major ingredient of experiential learning theory. In a classroom setting, oral debriefings are often used where the instructor leads the participants through a guided set of questions to generate information about the experience or activity. While oral briefings have been the norm, written debriefings and journals have also been used and are seen as a means of providing the same opportunity for reflection. In fact, when written debriefings require reflection, they may accommodate deeper processing than oral debriefings (Moon, 1999).

While at least five formats have been proposed for debriefings, most follow the sequence of Kolb's three reflective stages of the experiential learning cycle (Boud, Keogh, & Walker, 1985; Guild & Garger, 1998; Lederman, 1992; Petranek, Corey, & Black, 1992; Moon, 1999). Suggested debriefing formats generally include a review of the content of an experience (i.e., what happened, the action), a review of emotional

reactions to the experience from different participant perspectives, a discussion of concepts and relationships that can be surmised from the data generated from the reviews of the experience, and a call for developing plans for future action using the new learning. All of these are addressed in the current Record Book forms, as seen in Appendix A.

It is the responsibility of Extension educators to ensure opportunities for reflection are part of the learning process (Torock, 2009). The 4-H Youth Development Program relies heavily on volunteers—adults and teens—who facilitate educational activities with youth (Stedman & Rudd, 2006). Important components of constructivist theories and the experiential learning process have often been neglected as part of the learning process, and this is no different in 4-H programming (Carlson & Maxa, 1998; Dewey, 1938; Ponzio & Stanley, 1997; Torock, 2009). Ideally, all the members in leadership roles, such as club officers, are working and reflecting on their work experiences under the direction and guidance of a trained adult volunteer leader. The role of a 4-H adult volunteer leader is to create an appropriate environment for 4-H members to learn, and to provide guidance for the 4-H members to make their interactions with the environment positive and meaningful. The adult volunteers facilitate the learning process, and can help 4-H members process new information on a higher and more meaningful level by setting the stage for youth to have experiences, then by asking appropriate questions at timely points in a learning cycle, and finally, by encouraging true reflection. A 4-H leader who manages to keep 4-H members engaged, or interested, motivated, and actively participating, keeps 4-H members coming back (Carver & Enfield, 2006). If a 4-

H leader does not effectively guide members through the experiential learning cycle, or encourage this process of inquiry during hands-on experiences, youth can be cheated out of skills that encourage them to be competent and capable (Ponzio & Stanley, 1997).

METHODOLOGY

The research methodology for this project received an exemption by Montana State University's Institutional Review Board and compliance for work with human subjects was maintained (Appendix B). In an effort to improve perceived usefulness of 4-H record books and better complete the inquiry-based learning cycle of discussion and reflection, my primary action research challenge was for 4-H adult and youth leaders to use record books more consistently at club meetings and project workshops as a tool for goal-setting and reflection. My research questions concerned 4-H youth and volunteer member perceptions of record books, and whether or not they found club meetings and workshops more valuable and indicative of their progress.

Between October and November of 2018, fifty Lewis and Clark County volunteers and their junior superintendents attended one of four offered in-person workshops facilitated by me at the Lewis and Clark County Extension Office in Helena, MT. The volunteers present were trained on the inquiry-based learning cycle, its similarities to the 4-H Experiential Learning Model, and how record books fit into the discussion and reflection portion of the cycle using a presentation and handout (Appendix C). Volunteers were asked to brainstorm and plan how to incorporate record book reflection and discussion in their meetings and workshops (Figure 3). This segment was

part of a two-hour workshop discussing roles and responsibilities as Lewis and Clark county 4-H volunteers.

Non-Animal Project Journal & Financial Record



Record ALL the activities you do in this 4-H project as you do them.

Include things such as: project meetings, workshops, field trips, work, trainings, shows, concerts, learning experiences... anything related to your project.

WHEN YOU DID IT... WHAT YOU DID... WHAT YOU LEARNED!

[illegible]

More activities are listed at the end of this record form.

Figure 5. Montana 4-H Record Book Form Page for Reflection (“Non-Animal Project Journal, 2016).

Following the training, I visited club meetings and project workshops to analyze record book implementation. Some of these volunteer leaders had participated in the fall

training, while others had not. Leaders were consulted following the observation, and if needed, a plan was created to incorporate record book reflection and discussion into the meeting or workshop routine. Personal reflections during this process were recorded in my field journal.

Club meetings and project workshops were visited again, typically at least a month later. Subsequent implementation of record book reflection and discussion techniques in meetings and workshops by volunteers were measured through pre-determined Reflection Interview Questions (Appendix D). Leaders and youth members were interviewed on how they used record books in their project and club activities, and their feelings and perceptions of record books and their 4-H participation. This data was recorded and transcribed, with common responses coded, tallied, and calculated as percentages of total responses.

Throughout the 6 months of club and project evaluations, I personally visited 13 clubs at least once, formally presenting on goal-setting, the importance of reflection, and record book use with 8 of those clubs. I also addressed the importance of consistent record book incorporation into 4-H club and project activities during three county-wide meetings of 4-H teen leaders and adult project leaders, emphasizing preliminary results and the value of reflection in the 4-H Experiential Learning Model. I met with six club leaders and six project leaders one-on-one to create an action plan for record book incorporation in monthly meetings.

Club and project visits were designated pre-treatment or post-treatment based on whether the group was implementing reflection techniques or utilizing record books, and

the observations of the group and subsequent designation was documented in the Observation Rubric (Appendix E). The Observation Rubric criteria included inquiry-based teaching and learning, record books, and multi-aged learners. The rubric asked whether the facilitator accurately explains these three criteria, specifically if the facilitator used engaging discussion and reflection techniques, utilized record books to log observations, reflections, and goals, and used techniques appropriate for the age group. “Engaging” meant youth participants were interested, motivated, and actively participating in the discussion and/or reflection. This data was used to qualitatively indicate whether the leader changed their methods following treatment and was used in conjunction with the Reflection Interview Questions to determine a difference in responses pre- and post- treatment.

Pre- and Post- Treatment Record Book Surveys (Appendix F) were administered to 4-H volunteers and youth members pre-treatment and post-treatment at club and project events. The Pre- and Post- Treatment Record Book Survey used a Likert-style scale of 1 for Strongly Agree, 2 for Agree, 3 for Neither Agree nor Disagree, 4 for Disagree, and 5 for Strongly Disagree. The Likert-style format was chosen to measure perceptions of Lewis and Clark County 4-H and record book use within the county’s 4-H program. The significance of this survey between pre- and post- treatment was determined through Fisher’s Exact Test for Count Data (Bonnini, Corain, & Marozzi, 2014). Qualitative data collected through observations, surveys, interviews, and the reflective journal were analyzed for common themes. These responses were coded,

tallied, and calculated into percentages of the total responses. All analyses were conducted in program R version 1.1.456 and graphed using Microsoft Excel.

The triangulation matrix shows how these instruments provided multiple sources of data to answer the primary and secondary questions (see Table 1).

Table 1
Data Triangulation Matrix

Focus Question	Data Source 1	Data Source 2	Data Source 3	Data Source 4
1. How do 4-H youth member perceptions of record books before and after treatment change?	Pre- and Post-Treatment Record Book Surveys	Reflection Interview	Reflective journal	Observation Rubric
2. How do 4-H volunteer perceptions of record books before and after treatment change?	Pre- and Post-Treatment Record Book Surveys	Reflection Interview	Reflective journal	Observation Rubric
3. Does the perceived value of club meetings and project workshops improve after treatment?	Pre- and Post-Treatment Record Book Surveys	Reflection Interview	Reflective journal	Observation Rubric
4. Does the perception of growth in a project area improve after treatment?	Pre- and Post-Treatment Record Book Surveys	Reflection Interview	Reflective journal	Observation Rubric

DATA AND ANALYSIS

Overall Perceptions from the Record Book Survey

The results of combined youth and adult 4-H members perceptions from the pre-versus post-Treatment Record Book Survey indicated significant changes when participants were asked to rank their agreement with using record books weekly to record goals (Statement 11), using record books monthly to record goals (Statement 12), and

consulting record books when they have questions about progress (Statement 13) (Figure 4). Fisher's Exact Test p-values comparing pre- and post-treatment responses for statements 11, 12, and 13 were 0.004, 0.0002, and 1.217e-06 respectively. One 4-H adult volunteer who has implemented record books more frequently in her club and projects said, "[As a club leader] we usually address them within the first two meetings, set some goals, and then one or two other working meetings throughout the year, and then usually July or August we work on them as we wrap up towards fair. And in my [project] superintendent position, we address those at the end of every meeting." Other responses to statements concerning record books experienced a decrease in disagree and strongly disagree responses, but were not statistically different when comparing pre- versus post-treatment.

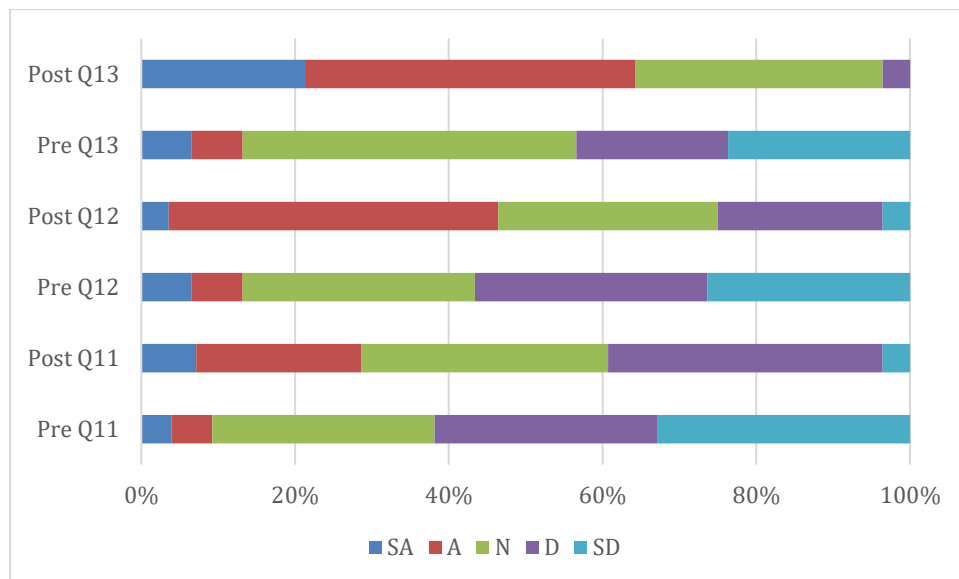


Figure 6. Overall record book perceptions for statement 11, “I/we use record books weekly to record goals,” statement 12, “I/we use record books monthly to record goals,” and statement 13, “I/we consult record books when we have questions about progress.”, (N=140).

Of the Reflection Interview Questions and open-ended questions on the Record Book Pre- and Post-Treatment Survey, responses were organized and coded into categories. When 4-H youth and adult members were asked to suggest ways to make, record books more valuable to youth, leaders, and parents, 25% of Pre-Treatment Record Book Survey participants responded a need for record books to be more enjoyable and less of a chore, 21% stated record books should not be so long, and 17% requested a couple group meetings a year to help learn about record books and how to organize information within the record books ($N=24$). Twenty-nine percent of Post-Treatment Record Book Survey responses for the same question expressed that record books are not talked about enough, and how a lot of members do not know what they are. Twenty-one percent of responses felt record books would be more valuable if 4-H persons focused more on what the member accomplished and their outcomes, so they “can see the difference in how we complete things to improve and change how we go about it.” Following an announcement our county may be piloting a mobile application version of the record book forms, 21% of responses were in favor of having record books on their phones for convenience ($N=14$).

When asked for suggestions to incorporate record books more throughout the year to improve ease of completion, 41% of 4-H youth and adult members who completed the Pre-Treatment Record Book Survey responded record books should be used more often during club and project meetings, 22% stated there should be monthly record book workshops or check-ins, and 19% requested the record book be shorter, changed, or have an alternative structure, such as a phone application ($N=27$). Post-treatment responses

increased to 60% of persons expressing that record books should be addressed at every club and project meeting (N=15). Other notable suggestions included, “Just do it,” from one youth member. Another said, “Have prizes.” Numerous youth and adult members supported and recommended to have record books online.

Overall Perceptions of 4-H, Goal Setting, and Reflection

Combined 4-H youth and adult responses showed little to no change pre-treatment versus post-treatment when asked about their enjoyment and perceived importance of 4-H (Figure 5). When comparing overall results of statements regarding goal setting, there was a 13% increase in strongly agree responses following treatment for “Setting goals is a valuable practice,” (Statement 4) and “Periodically checking in on where I am at in relation to my goals is important,” (Statement 5). When looking at pre- and post-treatment responses to statements regarding reflection, there was a 19% increase in strongly agree responses for, “Taking time to reflect on what I am doing or learning is valuable,” (Statement 6), a 6% increase for “I think it is important to reflect on what I/we are doing or learning in 4-H,” (Statement 8), and a 20% increase for “I find that when I look back at what I/we have recorded, I get a new perspective on what the season produced” (Statement 14).

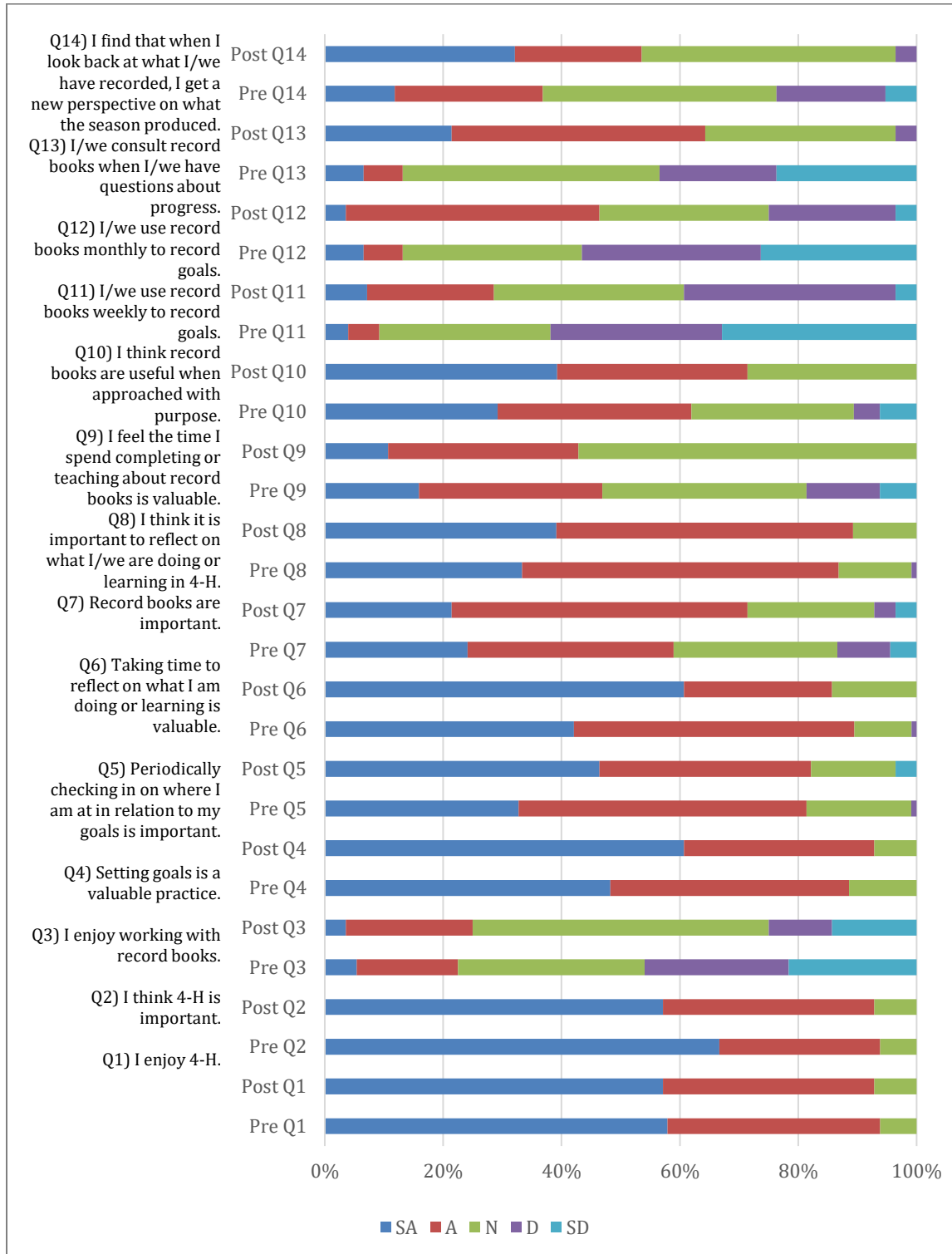


Figure 7. Pre- and post-treatment record book survey results, (N=142).

Adult Perceptions of 4-H, Goal Setting, Reflection, and Record Books

When comparing pre- ($n=41$) and post-treatment ($n=5$) responses for adult 4-H members only, there were no significant difference in responses for any of the 14 statements (Figure 6). Adult 4-H member perceptions of 4-H enjoyment and importance saw a decrease in strongly agree and neutral responses, and an increase in agree responses. Adult perceptions of record books importance and consulting record books with questions about progress both experienced an increase in strongly agree responses between pre- and post-treatment, at 2% and 10% respectively. The Fisher's Exact Test comparing pre- and post-treatment response frequencies produced a p-value of 1 for statement 7 and 0.3 for statement 13. All other statements regarding record books experienced an insignificant decrease in strongly agree responses post-treatment, but increased in combined strongly agree, agree, and neutral responses.

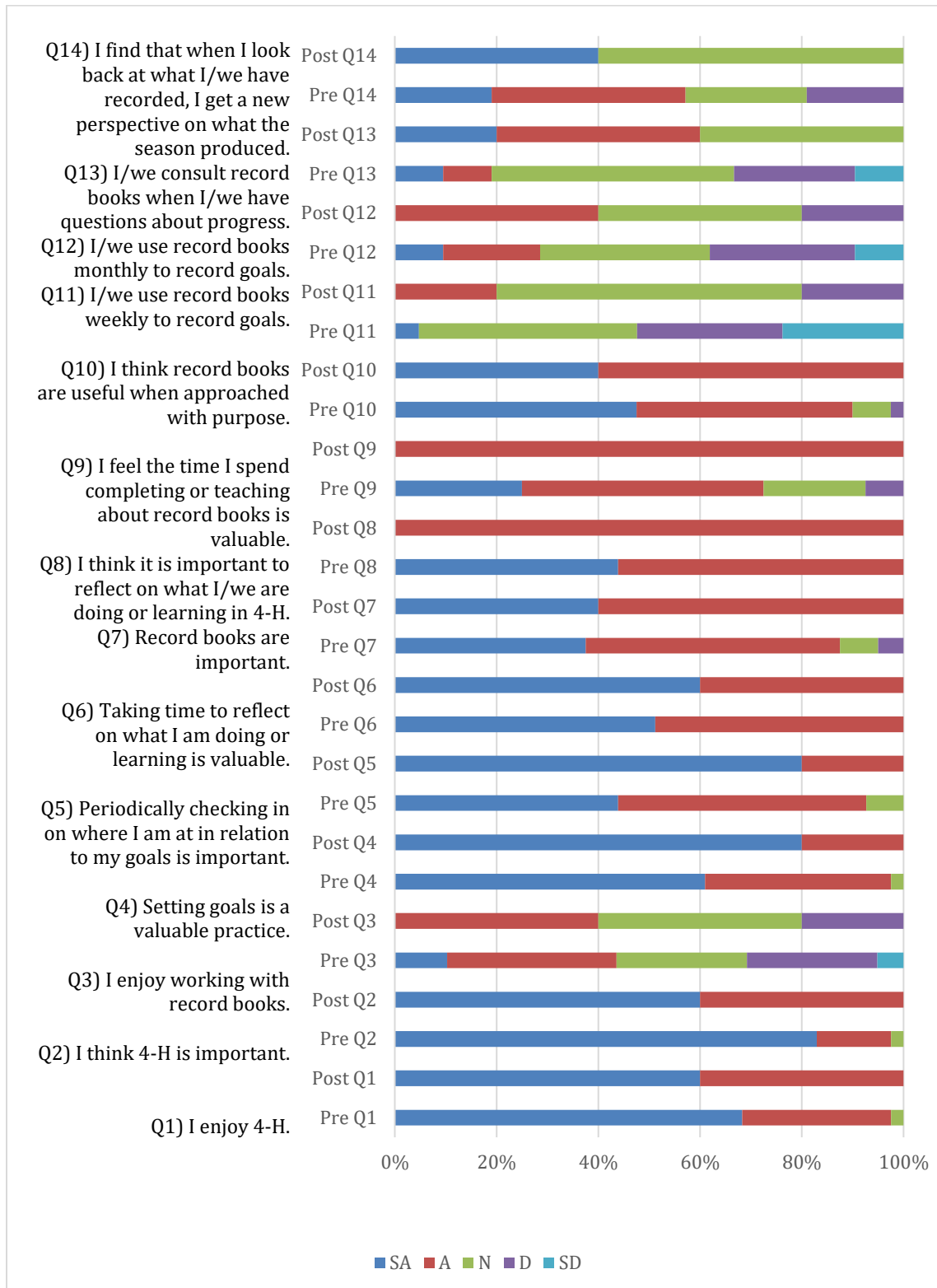


Figure 8. Pre- and post-treatment record book survey results for 4-H adult members, (N=46).

When comparing goal-setting statement response of adult 4-H members for the pre- and post-Record Book Surveys, there was a 19% increase in strongly agree responses post treatment that setting goals is a valuable practice (Statement 4) and a 36% increase for “Periodically checking in on where I am at in relation to my goals is important,” (Statement 5).

When looking at pre- and post-treatment responses to statements regarding reflection, there was a 9% increase in strongly agree responses for “Taking time to reflect on what I am doing or learning is valuable,” (Statement 6), a 44% decrease for “I think it is important to reflect on what I/we are doing or learning in 4-H,” (Statement 8), and a 21% increase for “I find that when I look back at what I/we have recorded, I get a new perspective on what the season produced” (Statement 14). Using the Fisher’s Exact Test, p-values were all above 0.05 and not statistically significant, with 1 for statement 6, 0.1405 for statement 8, and 0.155 for statement 14 (Figure 7).

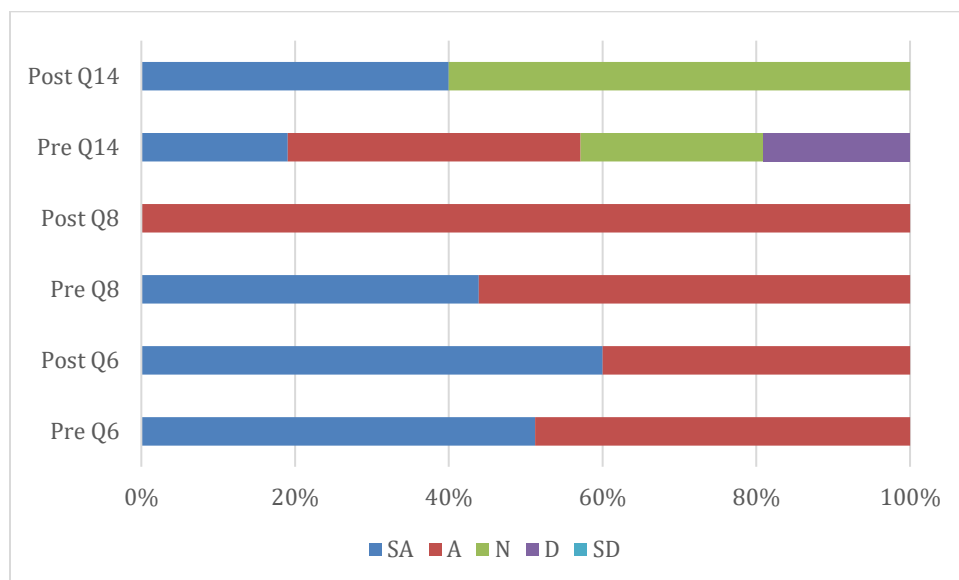


Figure 9. Adult perceptions of reflection, (N=46).

Youth Perceptions of 4-H

Youth perceptions of 4-H changed very little between pre- ($n=72$) and post-treatment ($n=23$), resulting in Fisher's Exact Test p -values of 0.9359 for "I enjoy 4-H," (Statement 1) and $p=1$ for "I think 4-H is important," (Statement 2). When comparing results of youth 4-H members for the pre- and post-Record Book Survey goal-setting statements, there was a 15% increase in strongly agree responses following treatment for "Setting goals is a valuable practice," (Statement 4) and a 12% increase for "Periodically checking in on where I am at in relation to my goals is important," (Statement 5) (Figure 8).

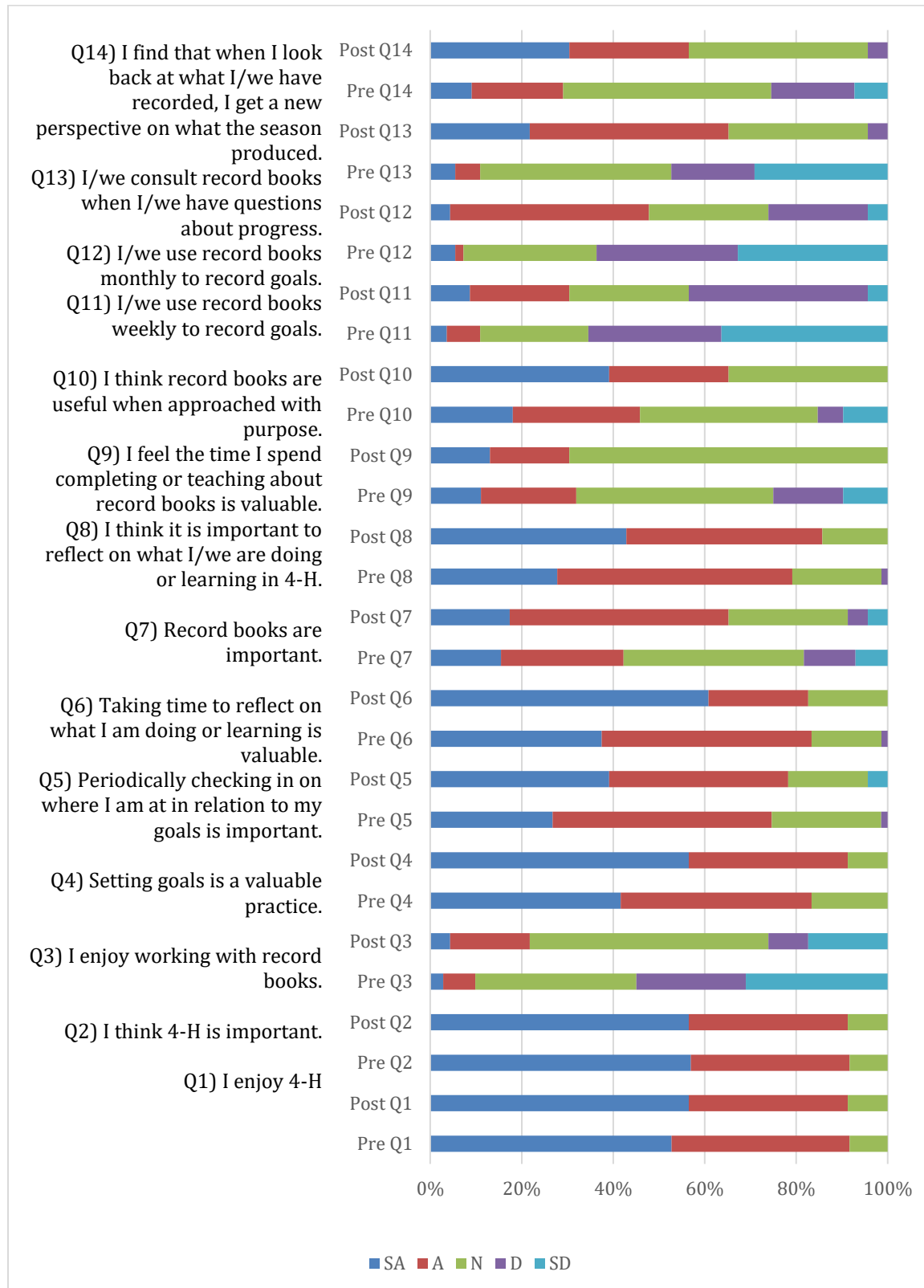


Figure 10. Pre- and post-treatment record book survey results (youth only), (N=95).

Youth Perceptions of Reflection

When looking at pre- and post-treatment responses to statements regarding reflection, there was a 23% increase in strongly agree responses for, “Taking time to reflect on what I am doing or learning is valuable,” (Statement 6), an 11% increase for, “I think it is important to reflect on what I/we are doing or learning in 4-H,” (Statement 8), and a 21% increase for, “I find that when I look back at what I/we have recorded, I get a new perspective on what the season produced” (Statement 14). Using the Fisher’s Exact Test, p-values were all above 0.05 and not statistically significant, with 0.1367 for statement 6, 0.6 for statement 8, and 0.074 for statement 14 (Figure 9).

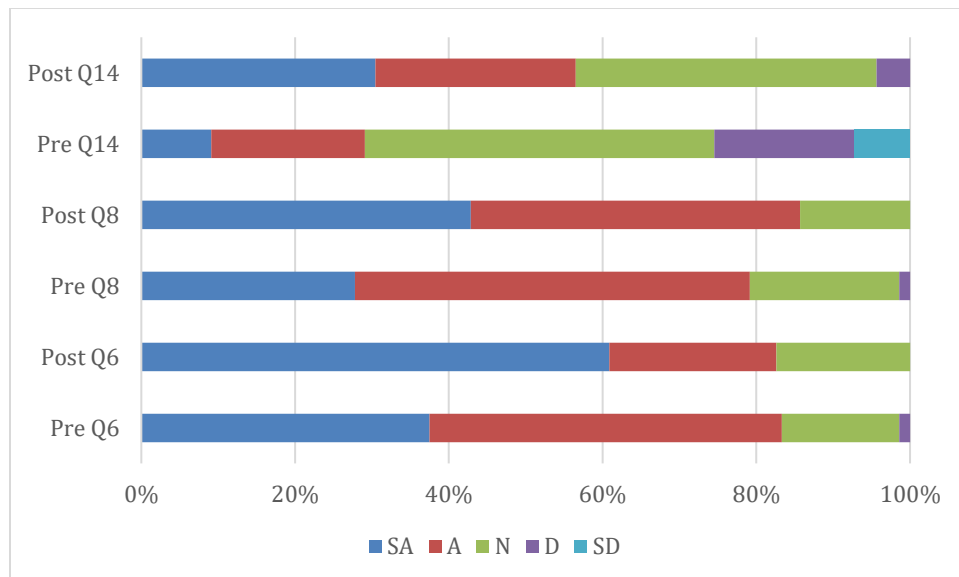


Figure 11. Youth perceptions of reflection, (N=95).

Youth Perceptions of Record Books

When comparing pre- ($n=72$) and post-treatment ($n=23$) responses for youth 4-H members only, “I/we use record books weekly to record goals,” (Statement 11), “I/we use record books monthly to record goals,” (Statement 12), and “I/we consult record books when I/we have questions about progress,” (Statement 13) produced significant p-values

of 0.014, 2.13e-05, and 5.98e-06, respectively. In addition, all statements except statement 12 experienced an increase in strongly agree responses post-treatment as compared to pre-treatment. Statement 12 saw a 1% decrease in strongly agree responses between pre- and post-treatment, but a 41% increase in agree responses (Figure 10).

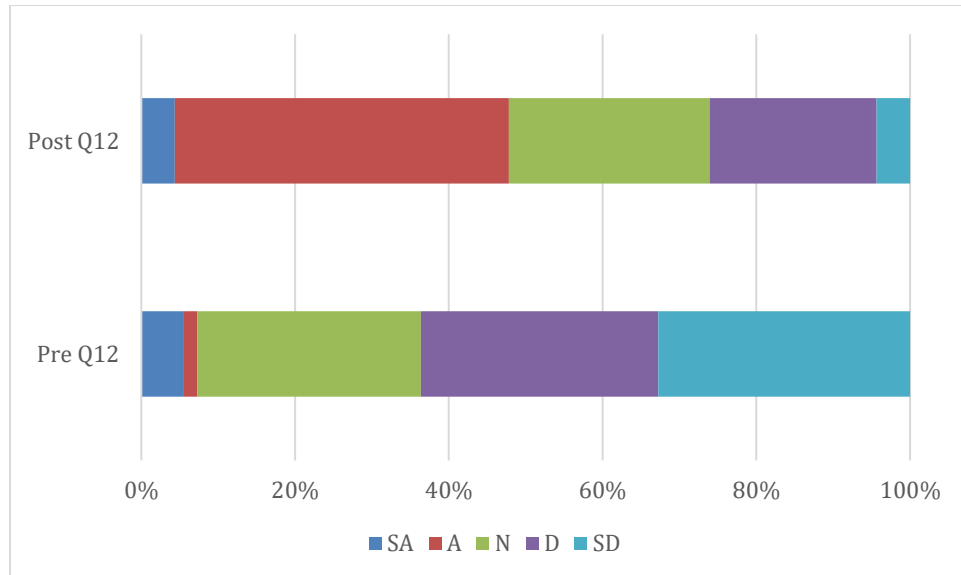


Figure 12. Youth response to "I/we use record books monthly to record goals", ($N=78$).

Comparing Youth and Adult Responses

The most statistically significant results of this study came from comparing adult versus youth 4-H member responses of the Pre-Treatment Record Book Survey (Figure 11). Seventy-one percent of the 14 questions on the Pre-Treatment Record Book Survey had statistically significant responses with p-values below 0.05 ($N=114$), while 0% of Post-Treatment Record Book Survey responses comparing adult versus youth members were statistically significant ($N=28$).

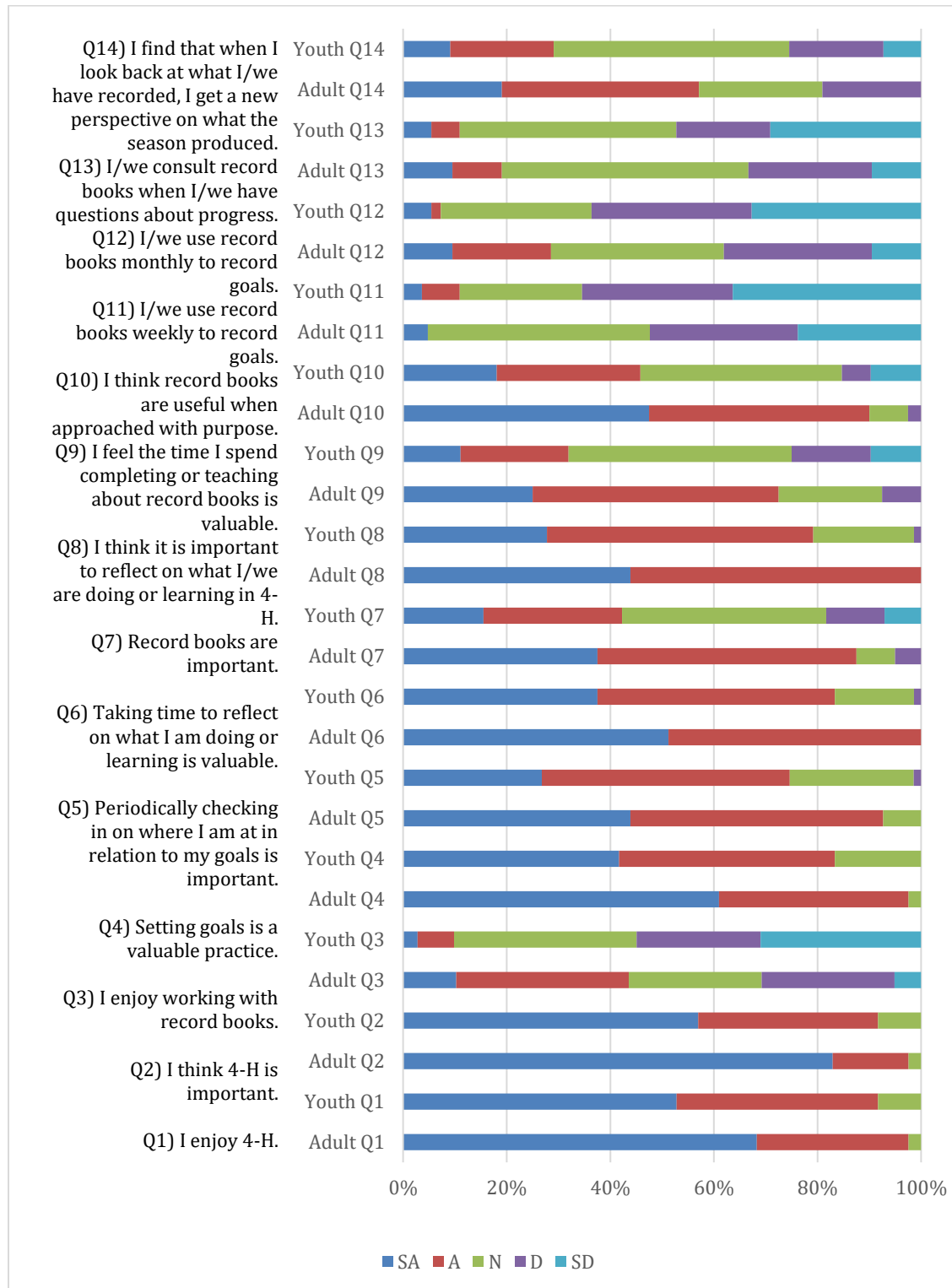


Figure 13. 4-H adult and youth member pre-treatment record book survey responses, (N=113).

When comparing youth and adult 4-H member responses on the Post-Record Book Survey, there was no significant difference between adults and youth for any of the questions on the survey (Figure 12).

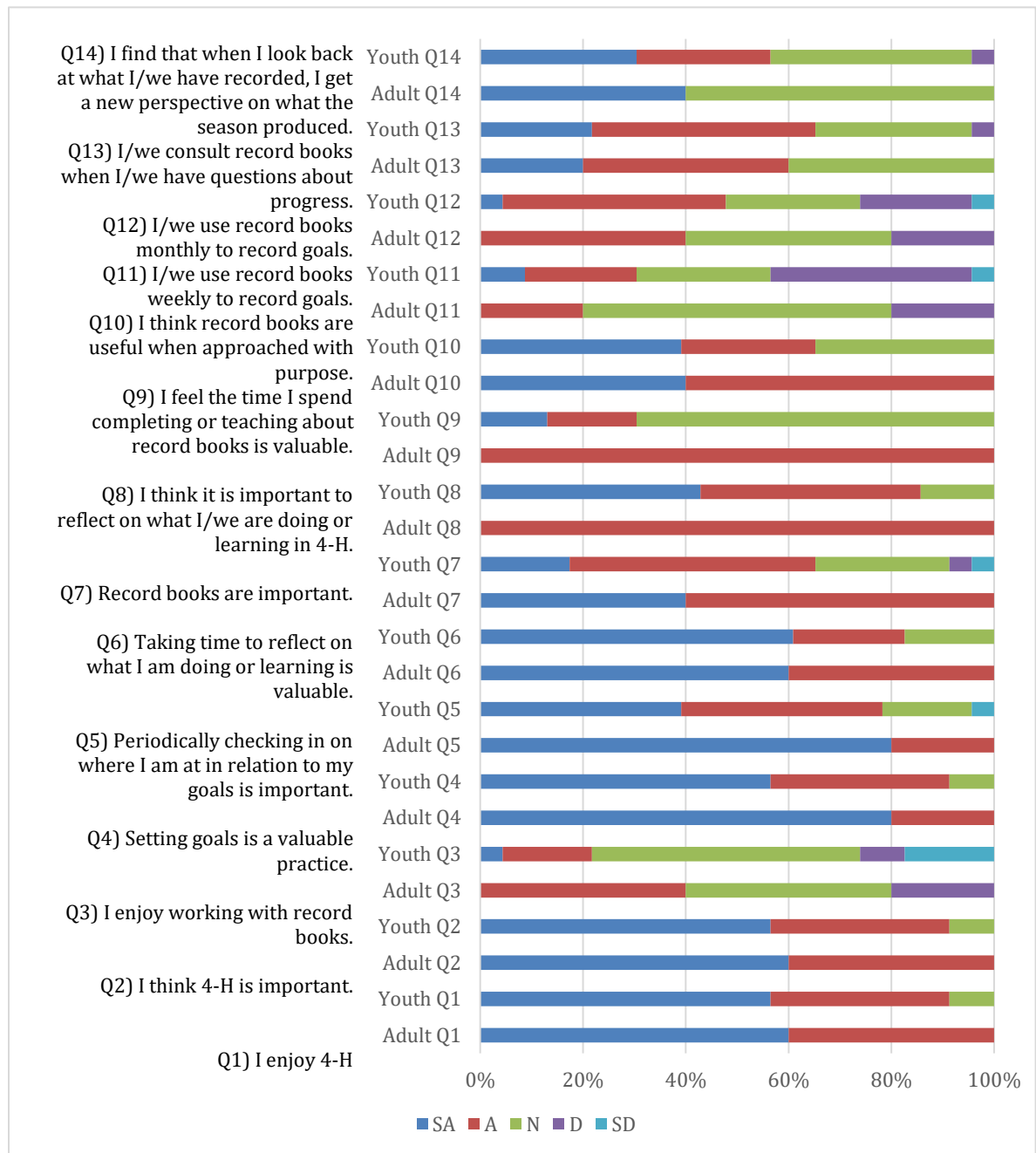


Figure 14. 4-H adult and youth member post-treatment record book survey responses, (N=28).

INTERPRETATION AND CONCLUSION

The Pre- and Post-Treatment Record Book Survey assessed 4-H youth and adult member perceptions of the Lewis and Clark County 4-H program and record books. The statements were written positively in the results that were targeted for improvement, so strongly agree responses were all in the strong affirmative of the statement provided, and thus a positive perception of that statement.

How do Perceptions of Record Books Before and After Treatment Change?

The data suggests youth and adult 4-H members used record books more often following treatment to record their goals and reflect on their progress. This mirrors youth sentiment that it would be more helpful for them if adult leaders incorporated record books during as many club and project meetings as possible.

There was no statistical difference between pre-treatment and post-treatment groups concerning their enjoyment or perceptions of 4-H, as well as perceiving setting goals a valuable practice. While their enjoyment working with record books, using record books to check where they are in relation to their goals, perceiving that taking time to reflect on what they are doing or learning is valuable, and the importance of record books were reported to be statistically insignificant post-treatment versus pre-treatment, there was a minor shift toward enjoying working with record books more post-treatment. There was a more defined shift toward putting more importance on periodically checking in with goals, perceiving reflection on their learning (in general and in 4-H) as valuable, and perceiving record books and their completion as being important and valuable, especially when approached with purpose.

There was a significant difference in most of the responses of youth versus adult 4-H members in the Pre-Record Book Survey, with p-values falling below 0.05, but no statistical difference between the two groups in the Post-Record Book Survey. These findings imply youth improved their perceptions of 4-H, record book completion, setting goals, and reflection, falling more in line with their parent's perceptions following treatment. This occurred during a relatively short time-frame, and suggests a major gain in youth perceptions of the value of reflection and record book use in 4-H activities, the beginning of a small movement of 4-H youth member expectations of adult leaders and the quality of their educational activities.

Adult and youth 4-H members agreed more with "Taking time to reflect on what I am doing or learning is valuable," (Statement 6) both pre- and post-treatment compared to "I think it is important to reflect on what I/we are doing or learning in 4-H," (Statement 8), however both statements increased positively post-treatment. This suggests 4-H members are beginning to recognize the benefits of reflection in 4-H as well as in general.

Does the Perceived Value of Club Meetings and Project Workshops Improve After Treatment?

Reflection Interview Questions revealed youth members feel their workshop or club meeting is helpful if it provides "important info I need to know, which a lot of times there is, or when others share what else is out there that they're doing in 4-H." Members also tie this into what makes club meetings and workshops valuable, including the skills they can take and use in other areas of their life. This ties in with the model of 4-H and

the Experiential Learning Cycle, mainly how youth find value during reflection and application.

Does the Perception of Growth in a Project Area Improve After Treatment?

Youth and adult 4-H members agreed record books were a good way to measure progress in their projects. “[Record books] show us what we’ve done and the effort we’ve put in. Some people, a lot of people, think we just raise an animal and that’s it. But there’s so much more.” Lewis and Clark County 4-H youth and adult members felt so strongly that record books are good indicators of their efforts they voted in June of 2019 to make up-to-date record books mandatory in order to show and sell livestock at the fair and enter projects to be judged. This motion was brought forth by the Lewis and Clark County 4-H Youth Council, and voted on by 13 of the 22 4-H clubs in the county, passing 9 to 4. This new county-wide regulation suggests a strong shift in positive perceptions in the value of using record books to keep track of progress in club and project activities throughout the 4-H year. One hundred percent of 4-H youth members at this Council meeting, when asked how best to use record books in 4-H activities for their success, responded to use them more consistently ($N=7$). This regulation is now motivation for adult 4-H leaders to take a more active approach in utilizing record books during their project and club activities to ensure the success of their youth members come fair time.

VALUE

Record books are still required for Montana 4-H programming, but the autonomy the Extension Department at Montana State University and the Montana 4-H Center

grants to counties means there is sometimes little incentive or understanding of why or how record books are important and should be completed. 4-H utilizes the Experiential Learning Model, of which reflection and application is important for quality learning. Record books are a natural tool to accomplish these parts of the cycle.

When I began this study, I was very new to the county as an Extension Agent, and the communal hatred of record books was palpable. This is not uncommon as record books are often left until the last moment and not discussed. This is difficult on families and volunteers, and adds extra stress. It became a priority for me to find out why we complete record books, and to incorporate them in a way that is beneficial to my constituents. Now when I visit clubs and projects and talk about record books, I notice youth taking a more interested approach in why record books are used in 4-H, and watch them consider the implications record books can have for them personally as they monitor their progress. Youth-led changes in the county 4-H program is testament to the heightened visibility and value of record books to 4-H youth members.

This study is still preliminary. Most clubs and projects were reported on the Observation Rubric as pre-treatment, meaning the facilitator did not address record books or did not incorporate other effective forms of discussion and reflection during the time of reporting. The data I collected was valuable, but I hoped to have more post-treatment data than I was able to collect within the six-month time frame. This is a different experience for me than a classroom setting (where I was when I began the MSSE program). Here I hold more of an administrative position, depending on volunteers to correctly institute the treatment within their club meetings and project workshops. This

meant I ultimately had less control, as I visited clubs and projects (which occur once a month) and then had to revisit several times before the treatment was considered effective. I had to depend on more people than myself to make sure the treatment was implemented, had to learn how to teach adults, and learned how to hold them accountable. Surprisingly, I underestimated the impact I had on our 4-H youth members and the subsequent gains they made in perceptions of 4-H, record books, reflection, and goal-setting within a short time frame. Even though I could not fully rely on my adult volunteers to implement treatment, the youth were listening and responding in their own way.

The mission of Montana Extension is to, “Improve the lives of Montana citizens by providing unbiased, research-based education and information that integrates learning, discovery, and engagement to strengthen the social, economic, and environmental well-being of individuals, families, and communities” (“Montana State,” n.d.). In my position as Lewis and Clark County’s 4-H and Youth Development Extension Agent, I have to make decisions every day that will impact many people and set a trajectory for future projects, programs, and policies. It gives me peace of mind to know the feedback I receive supports the conceptual information I base my decisions and plans off of. In addition, it is already exciting to share my preliminary results with other Agents who run into the same problems with record books as our county, or even to encourage other counties to use record books as the beneficial learning tool it really is. As a past 4-H member, I never thought I would be this gung-ho about record books. But it is easy to see the value when you watch and listen to youth reflect on their learning and how they have

used it in their outside lives. As I told my volunteers when I started, “This may be the hill I die on,” but I do not regret it, and I am sure there will be more action research hills for me in the future.

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APPENDICES

APPENDIX A
MONTANA 4-H RECORD BOOK FORMS

My 4-H Year



4-H Year: _____

This Record Belongs to					
County					
Club					
Age		Years In 4-H		Grade In School	

These are my projects for this year	



My Photo

[illegible][illegible]

My 4-H Year



Club & Project Club Meeting Participation

Record the number of club & organized project meetings you attend. Add notes as needed.

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Club Name <u>Example Club</u>	1	1	No Meeting	1	Missed Meeting -Sick	2	1	1	No Meeting	2	1	1
Club/Project Name _____												
Club/Project Name _____												
Club/Project Name _____												
Club/Project Name _____												
Club/Project Name _____												

Offices & Committees (4-H and other)

Record club offices you hold and committees you are a member of. If you need more space, use the extra pages at end of this record form, and check the box below.

Name of Committee or Office	Describe what you do

More committees & offices are listed at the end of this record form.



My 4-H Year



Promotional Presentations

Record ways you have promoted or publicized 4-H (examples: wore my club t-shirt, National 4-H Week booth, published a news article, etc.). If you need more space, use extra pages at end of this record form, and check the box below.

Type of Presentation	Description	Event or Location	Date

More promotional presentations are listed at the end of this record form. ☐

Communications Activities

Record your communications activities. (examples: Demonstration/Illustrated Talk, Kiwanis Report, reports at club meetings, public speaking, etc.) If you need more space, use extra pages at end of this record form, and check the box below.

Type of Communication	Title	Event or Location	Date

More communications activities are listed at the end of this record form. ☐

[illegible]☐

My 4-H Year



Journal of Activities, Events & Experiences

Use this page to record **ALL** activities, events, and experiences as you have them. Include things such as school, sports, church, home chores, civic and volunteer activities. If you need more space, use extra pages at end of this record form, and check the box below.

[illegible]

More activities, events & experiences are listed at the end of this record form.

☐

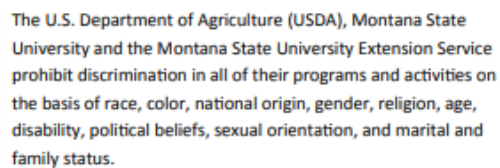
[illegible]

4-H Club Member

4-H Club Leader

Date _____

Date _____



4-H Year: _____



This Record Belongs to	
County	
Project Name	
Years in the Project	



My Photo

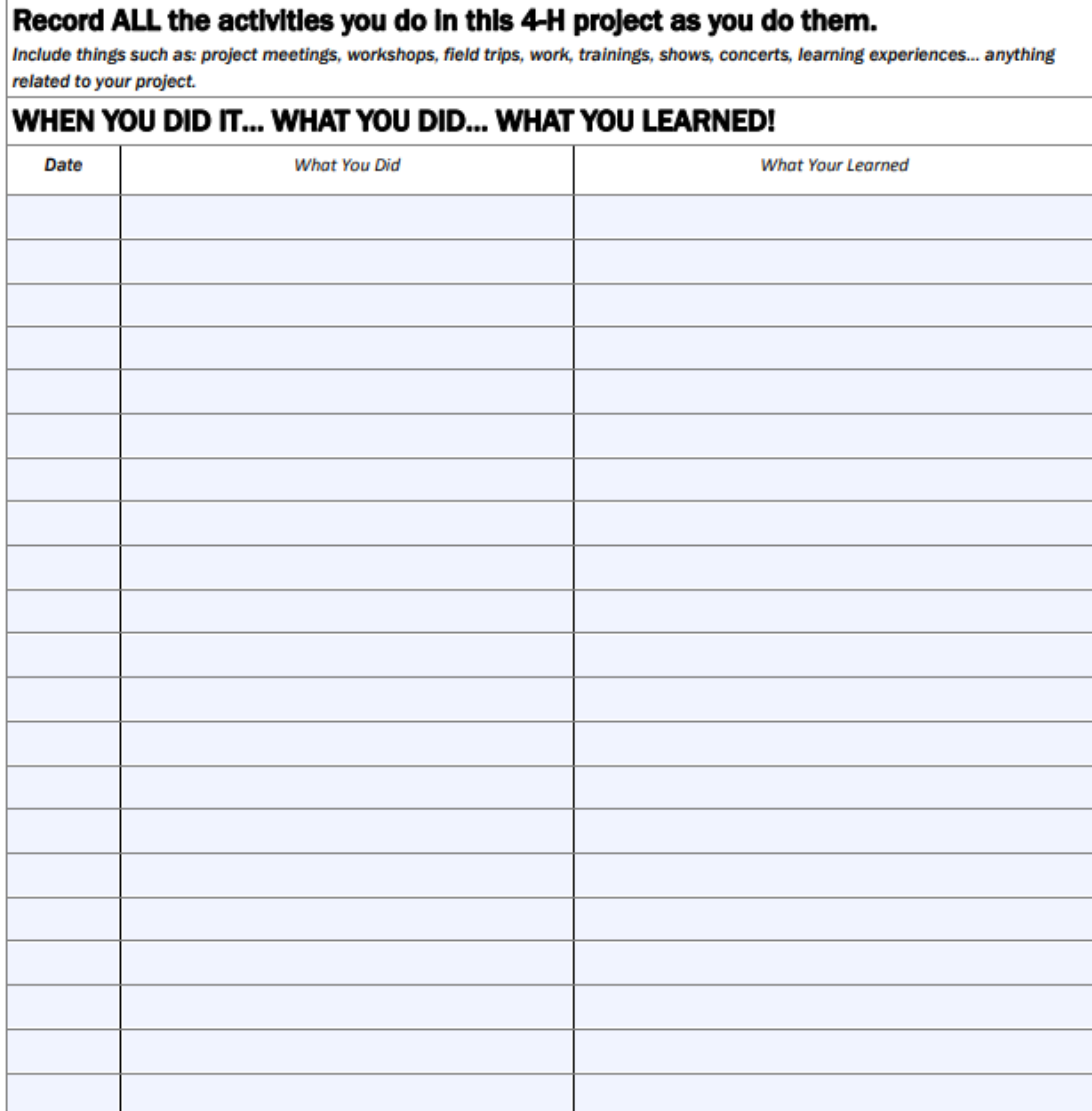
These are my project goals for this year.

Briefly describe your project goals for the coming year. Use only the space provided. Use your tab key to move to the next line.

Did you reach your project goals?

Briefly describe what happened throughout the year as you attempted to reach your goals. Use your tab key to move to the next line.

[illegible]



Non-Animal Project Journal & Financial Record



Record of Project Finances

Record as **INCOME** all money you receive from the sale of services and/or products from this non-animal project. Record as **EXPENSES** all the items you pay for with money to support this non-animal project.

Date	Description of Income or Expense	Income	Expense
Subtotals (this page)		\$0.00	\$0.00

More finance records are listed at the end of this record



Non-Animal Project Journal & Financial Record



Financial Summary	Income	Expense
Subtotals from previous page		
Combined subtotals from any additional pages		
Total Income & Expenses		
Total Income		
Total Expenses		
Profit or Loss		
Subtract your income from your expenses. PROFIT is a positive amount and LOSS is a negative amount.		

Comments

Record notes or other comments you have about this project.

I have evaluated my records and believe that they are accurate, complete and verify that this represents my own work.

_____	_____
4-H Club Member	Date

I have reviewed this record book.

_____	_____
4-H Club Leader	Date



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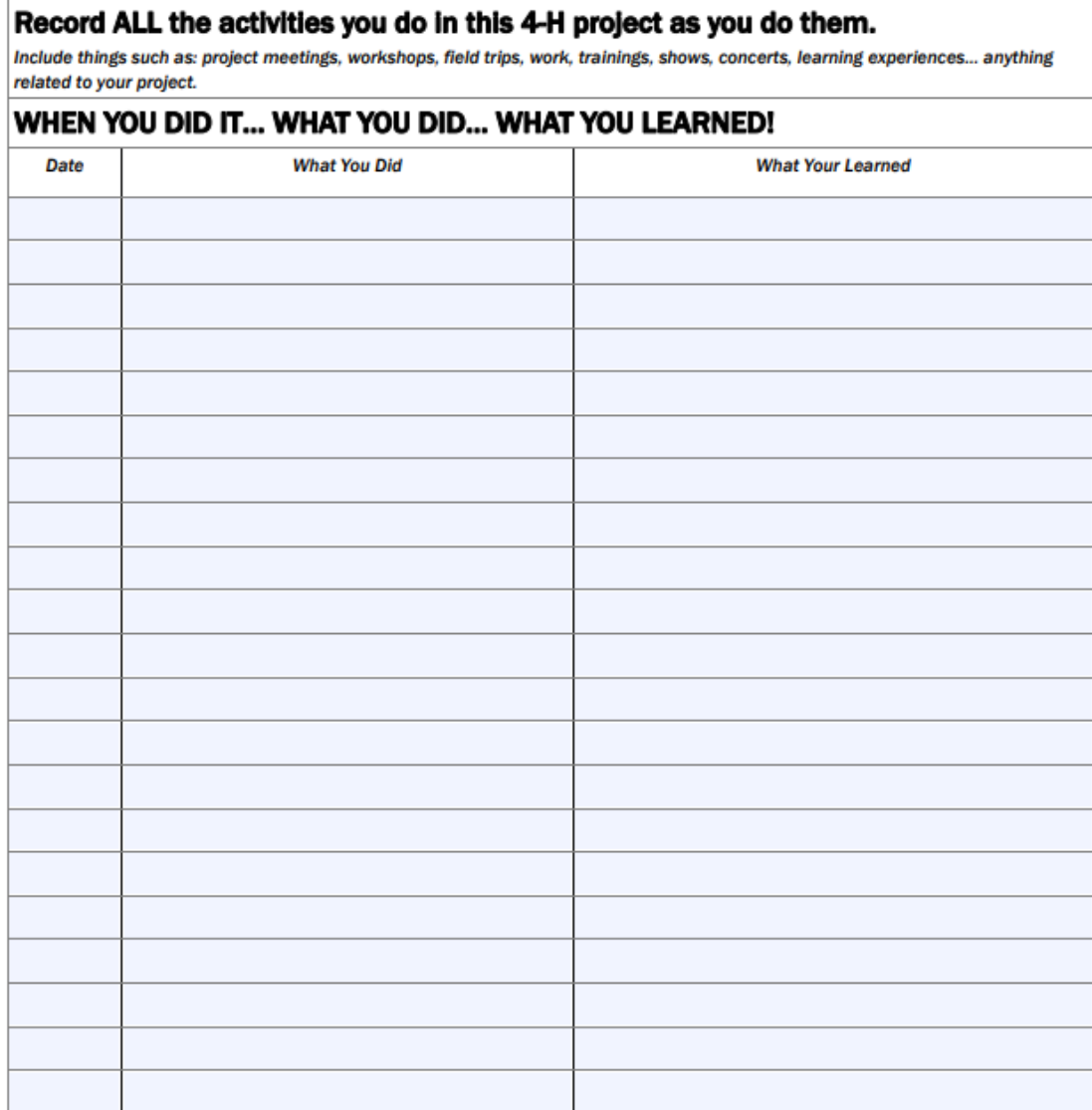



MONTANA
 STATE UNIVERSITY | EXTENSION
 

These are my project goals for this year.

[illegible]



More activities are listed at the end of this record form. 

Animal Project Journal & Financial Record



Value of Animal(s) Purchased/Owned/Possessed						
Enter the value of animal(s) that you owned <u>prior to beginning this project year</u> or that you purchased or were given for this project.						
Date	Description	Number	Purchased From/ Owned By	Weight	Unit Price	Market Value
Subtotal (this page)						\$0.00
Subtotal (combined from additional pages)						
Total Market Value (TOTAL A)						\$0.00

More animals owned at the BEGINNING of project are listed at the end of this record form. ☐

Value of Animal(s) Owned at End of Project				
Enter the value of animal(s) that you owned <u>at the end of this project year</u> .				
Date	Description	Number	Weight	Estimate Value/ Price
Subtotal (this page)				\$0.00
Subtotal (combined from additional pages)				
Total Estimated Value (TOTAL B)				

More animals owned at END of project are listed at the end of this record form. ☐

Animal Project Journal & Financial Record



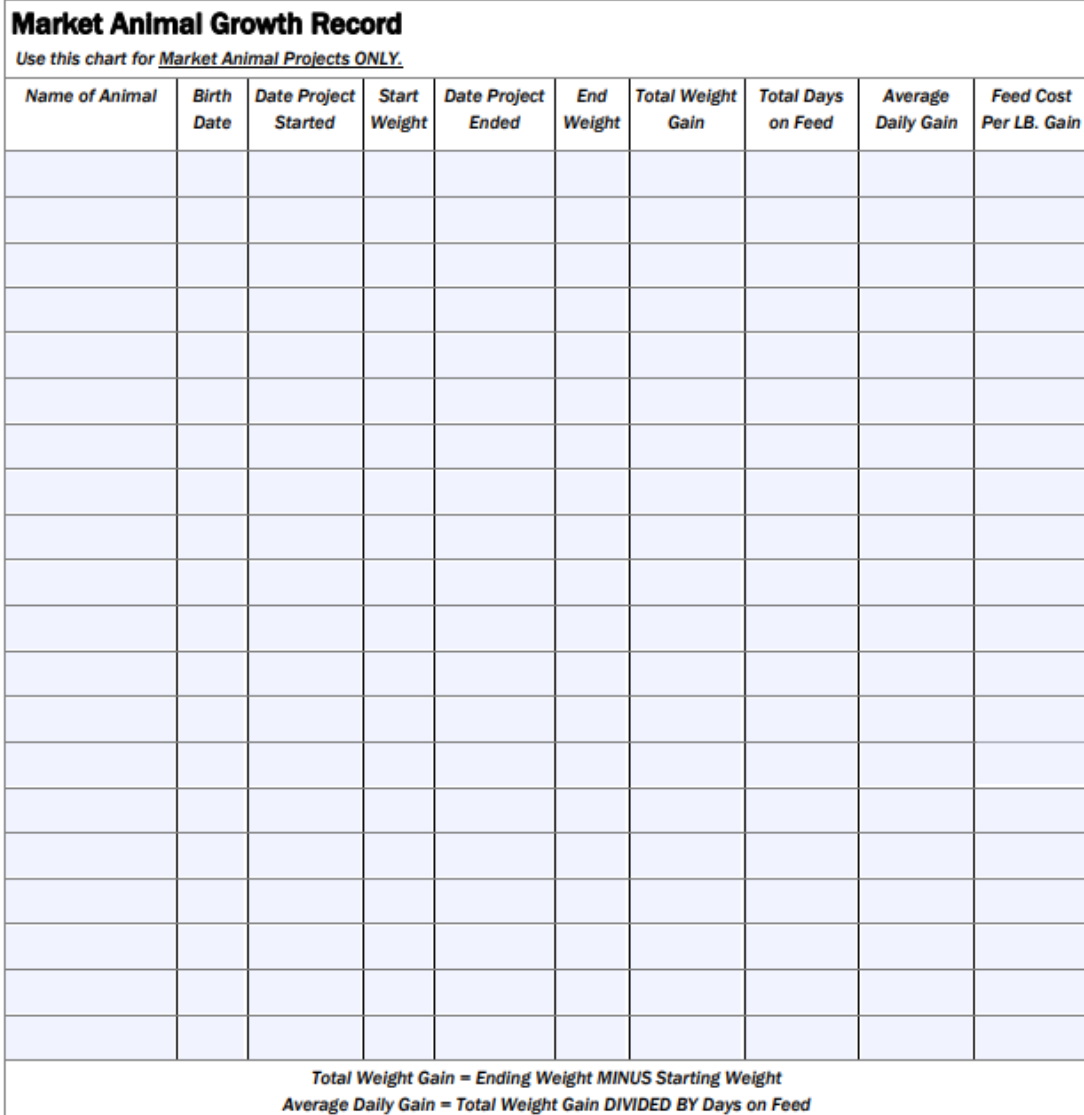
Feeding Record

Write the kind of feed at the top of the columns. Use the units (pounds, cwt, tons) that are most convenient for you, however be consistent. Also record how much the feed for each month costs. Use the chart to keep track of feed for all animals in this project.

Animal								
Kind of Feed								
Month	Amount	Price	Amount	Price	Amount	Price	Amount	Price
October								
November								
December								
January								
February								
March								
April								
May								
June								
July								
August								
September								
Totals		\$0.00		\$0.00		\$0.00		\$0.00
Price/Unit								
Subtotal (this page)							\$0.00	
Subtotal (combined from additional pages)								
Total Feed Cost (TOTAL C)								
Comments								
Record notes or other comments you have regarding this feeding record. Use the tab key to move to next line.								

More feeding records are listed at the end of this record form.





More market animal growth records are listed at the end of this record form.

Animal Project Journal & Financial Record

**Expenses other than feed.**

Record any other expenses such as taxes, marketing, transportation cost, show expenses, insurance etc.

Item and Description	Cost
Subtotal (this page)	\$0.00
Subtotal (combined from additional pages)	
Other Expenses Total (TOTAL E)	

More expenses are listed at the end of this record form.

Animal Project Journal & Financial Record



Health Care Chart						
<i>Date</i>	<i>Reason for Treatment</i>	<i>How Administered</i>	<i># of Animals</i>	<i>Size of Dose</i>	<i>Cost Per Animal</i>	<i>Total Cost</i>
Subtotal (this page)						\$0.00
Subtotal (combined from additional pages)						
Total Health Care Cost (TOTAL F)						

More healthy care records are listed at the end of this record form.



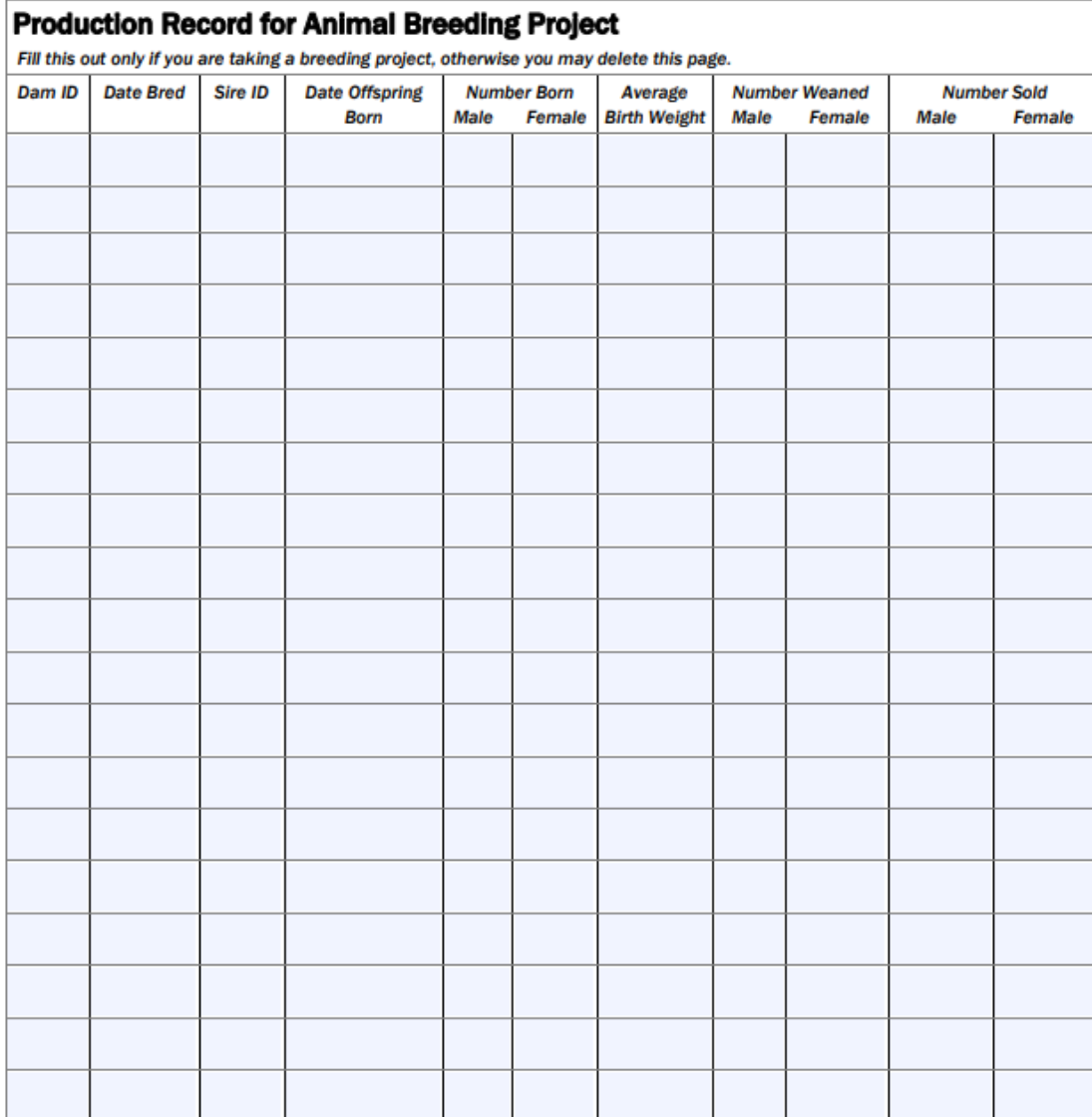
Animal Project Journal & Financial Record



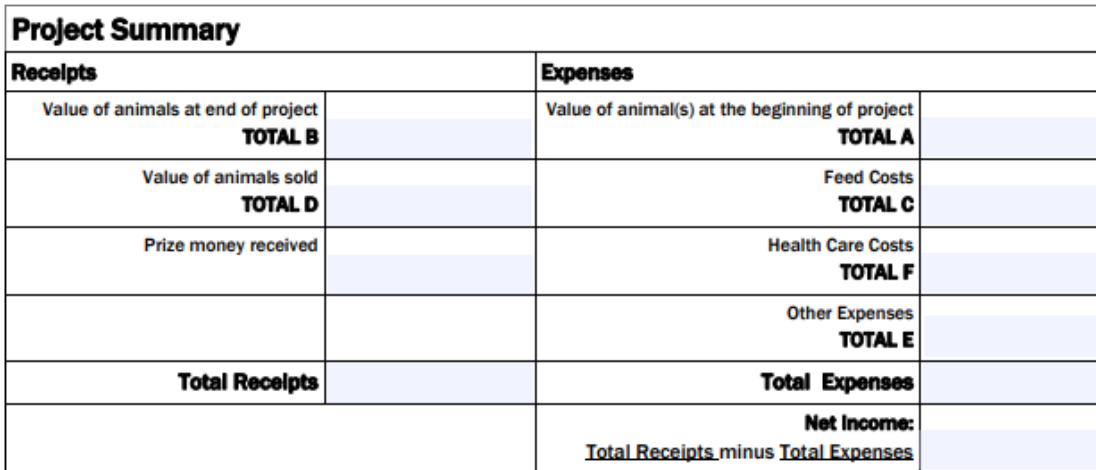
Sales Record						
<i>Record the sale of your animal(s) or sale of goods from the animal (includes wool, etc.)</i>						
Animal Sold	#	Date	Place Sold	Sale Weight	Selling Price	Total Sale
Subtotal (this page)						\$0.00
Subtotal (combined from additional pages)						
Sales Total (TOTAL D)						

More sales records are listed at the end of this record form.





More breeding records are listed at the end of this record form.



Record notes or other comments you have about this project.

_____ 4-H Club Member _____ Date

4-H Club Leader Date



APPENDIX B

MONTANA STATE UNIVERSITY INSTITUTIONAL REVIEW BOARD EXEMPTION



INSTITUTIONAL REVIEW BOARD
For the Protection of Human Subjects
FWA 00000165

2155 Analysis Drive
 c/o Microbiology & Immunology
 Montana State University
 Bozeman, MT 59718
 Telephone: 406-994-6783
 FAX: 406-994-4303
 E-mail: cherylj@montana.edu

Chair: Mark Quinn
 406-994-4707
 mquinn@montana.edu
Administrator:
 Cheryl Johnson
 406-994-4706
 cherylj@montana.edu

MEMORANDUM

TO: Kara Tangedal and John Graves

FROM: Mark Quinn, Chair *Mark Quinn CJ*

DATE: November 26, 2018

RE: "How Incorporating 4-H Record Books into Club and Project Activities Affect Youth Member and Volunteer Perception of Record Books and Project Accomplishments" [JB112618-EX]

The above research, described in your submission of November 25, 2018, is exempt from the requirement of review by the Institutional Review Board in accordance with the Code of Federal regulations, Part 46, section 101. The specific paragraph which applies to your research is:

- X (b) (1) Research conducted in established or commonly accepted educational settings, involving normal educational practices such as (i) research on regular and special education instructional strategies, or (ii) research on the effectiveness of or the comparison among instructional techniques, curricula, or classroom management methods.
- X (b) (2) Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures or observation of public behavior, unless: (i) information obtained is recorded in such a manner that human subjects can be identified, directly or through identifiers linked to the subjects; and (ii) any disclosure of the human subjects' responses outside the research could reasonably place the subjects at risk of criminal or civil liability, or be damaging to the subjects' financial standing, employability, or reputation.
- _____ (b) (3) Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures, or observation of public behavior that is not exempt under paragraph (b)(2) of this section, if: (i) the human subjects are elected or appointed public officials or candidates for public office; or (ii) federal statute(s) without exception that the confidentiality of the personally identifiable information will be maintained throughout the research and thereafter.
- _____ (b) (4) Research involving the collection or study of existing data, documents, records, pathological specimens, or diagnostic specimens, if these sources are publicly available, or if the information is recorded by the investigator in such a manner that the subjects cannot be identified, directly or through identifiers linked to the subjects.
- _____ (b) (5) Research and demonstration projects, which are conducted by or subject to the approval of department or agency heads, and which are designed to study, evaluate, or otherwise examine: (i) public benefit or service programs; (ii) procedures for obtaining benefits or services under those programs; (iii) possible changes in or alternatives to those programs or procedures; or (iv) possible changes in methods or levels of payment for benefits or services under those programs.
- _____ (b) (6) Taste and food quality evaluation and consumer acceptance studies, (i) if wholesome foods without additives are consumed, or (ii) if a food is consumed that contains a food ingredient at or below the level and for a use found to be safe, or agricultural chemical or environmental contaminant at or below the level found to be safe, by the FDA, or approved by the EPA, or the Food Safety and Inspection Service of the USDA.

Although review by the Institutional Review Board is not required for the above research, the Committee will be glad to review it. If you wish a review and committee approval, please submit 3 copies of the usual application form and it will be processed by expedited review.

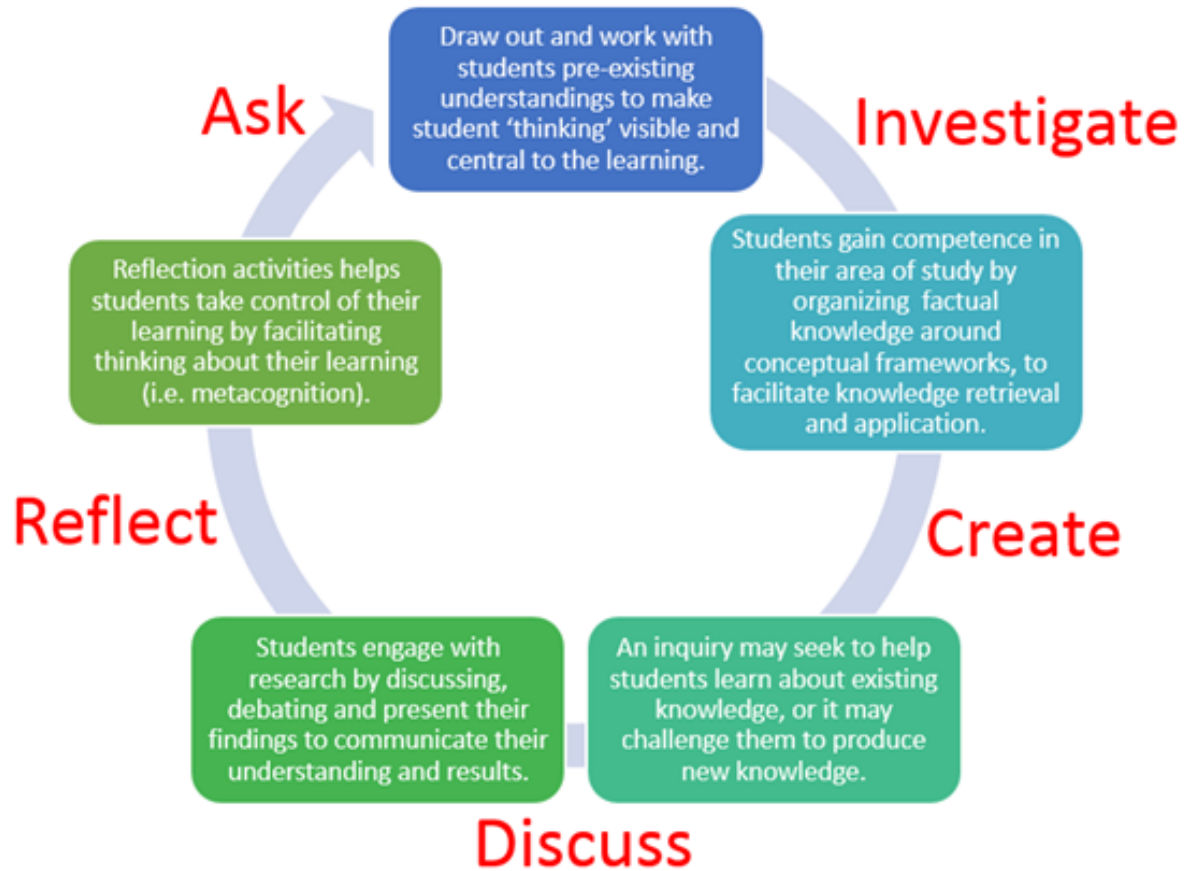
APPENDIX C
INQUIRY-BASED LEARNING HANDOUT

Why 4-H was/is ahead of its time.

FORMS OF INQUIRY-BASED LEARNING

Aspect	Problem-based Learning	Project-based Learning	Case-based teaching
<i>What provides structure</i>	Starts with a real world problem which is unstructured, open-ended, and this needs to be refined before it can be addressed.	Starts with clear specification of an end-product that is usually tangible.	Starts with (usually) real case narratives that are written to exemplify how concepts/theories can be applied.
<i>Typical process</i>	Students are responsible for refining the problem, and also identifying what they need to know and how to bridge any knowledge-gaps.	In working to produce the desired product, students encounter 'mini-problems' which need to be solved.	Students usually discuss cases in groups. They analyze cases and answer questions already composed by the instructors.
<i>Pedagogical emphasis & purpose</i>	Emphasis is on the process of solving the problem; the main purpose is to acquire new knowledge.	Emphasis is on the product of the activity; the main purpose is to practice applying knowledge.	Emphasis is on the process of analysing cases; the main purpose is to acquire new knowledge.

Inquiry-Based Learning



Where do record books fit in?

APPENDIX D
REFLECTION INTERVIEW QUESTIONS

Introductory Text: Participation in this research is voluntary and participation or non-participation will not affect your standing in 4-H in any way. Your identity will remain anonymous. You can stop this interview at any time. You do not have to answer any question you do not want to.

Interview Questions for Youth Members

1. How long have you been in 4-H?
2. How many years have you done a record book?
3. When and how do you normally complete your record book?
4. Do you use your record book at club meetings?
5. Do you use your record book at project meetings?
6. How do you feel when you're completing your record book?
7. Why do you think we do record books?
8. Do you find record books helpful? When, and why or why not?
9. How do you decide if a workshop or club meeting is helpful?
10. What makes a workshop or club meeting valuable?
11. How do you measure progress with your project?
12. What suggestions do you have to make record books more valuable to youth, leaders, and parents?
13. What suggestions do you have to incorporate record books more throughout the year to improve ease of completion?
14. Is there anything else you would like me to know?

Interview Questions for Adult Volunteers

1. How do you volunteer for 4-H?
2. How long have you volunteered for 4-H?
3. When and how do you normally address record books?
4. How do you feel when you're working on record books?
5. Why do you think we do record books?
6. Do you find record books helpful? When, and why or why not?
7. How do you decide if a workshop or club meeting is helpful to members?
8. What makes a workshop or club meeting valuable to members?
9. How do you measure progress with your members' project?
15. What suggestions do you have to make record books more valuable to youth, leaders, and parents?
16. What suggestions do you have to incorporate record books more throughout the year to improve ease of completion?
10. Is there anything else you would like me to know?

APPENDIX E
OBSERVATION RUBRIC

Leader: _____

Club/Project: _____

Date: _____ Visit: 1 2 3

Location: _____ Number of Participants: _____

Criteria	Facilitator accurately facilitates/explains...	Facilitator needs improvement in facilitation/ explanation of...	Facilitator does not address...
Inquiry-based teaching and learning	☐ Engaging discussion techniques ☐ Engaging reflection techniques	☐ Engaging discussion techniques ☐ Engaging reflection techniques	☐ Engaging discussion techniques ☐ Engaging reflection techniques
Record books	☐ Where to log 'What I Did' ☐ Where to log 'What I Learned' ☐ Setting and evaluating goals	☐ Where to log 'What I Did' ☐ Where to log 'What I Learned' ☐ Setting and evaluating goals	☐ Where to log 'What I Did' ☐ Where to log 'What I Learned' ☐ Setting and evaluating goals
Multi-Aged learners	☐ Age-appropriate goals and record-keeping	☐ Age-appropriate goals and record-keeping	☐ Age-appropriate goals and record-keeping

Additional Comments:

APPENDIX F

PRE- AND POST- TREATMENT RECORD BOOK SURVEY

Participation in this research is voluntary and participation or non-participation will not affect your standing in 4-H in any way. Your identity will remain anonymous. You do not have to answer a question you do not want to.

1. What county are you enrolled in 4-H?: _____
2. What role do you serve in 4-H? Circle all that apply: *Member* *Parent*
Volunteer
3. Approximately how many years have you been involved with 4-H?: _____
4. Have you completed a record book before?: Yes No

For each of the questions below, circle the response that best characterizes how you feel about the statement, where: 1 = Strongly Agree, 2 = Agree, 3 = Neither Agree nor Disagree, 4 = Disagree, and 5 = Strongly Disagree

	<i>Strongly Agree</i>	<i>Agree</i>	<i>Neither Agree nor Disagree</i>	<i>Disagree</i>	<i>Strongly Disagree</i>
1. I enjoy 4-H	1	2	3	4	5
2. I think 4-H is important	1	2	3	4	5
3. I enjoy working with record books	1	2	3	4	5
4. Setting goals is a valuable practice	1	2	3	4	5
5. Periodically checking in on where I am at in relation to my goals is important	1	2	3	4	5
6. Taking time to reflect on what I am doing or learning is valuable	1	2	3	4	5
7. Record books are important	1	2	3	4	5

8. I think it is important to reflect on what I/we are doing or learning in 4-H	1	2	3	4	5
9. I feel the time I spend completing or teaching about record books is valuable	1	2	3	4	5
10. I think record books are useful when approached with purpose	1	2	3	4	5
11. I/we use record books weekly to record goals	1	2	3	4	5
12. I/we use record books monthly to record goals	1	2	3	4	5
13. I/we consult record books when I/we have questions about progress	1	2	3	4	5
14. I find that when I look back at what I/we have recorded, I get a new perspective on what the season produced	1	2	3	4	5

- What suggestions do you have to make record books more valuable to youth, leaders, and parents?

- What suggestions do you have to incorporate record books more throughout the year to improve ease of completion?

Is there anything else you would like me to know?