Preparing for Effective Program Dissemination and Implementation: An Analysis of Problems and Proposals for the iCook 4-H Program

Jodi L. Randall
University of Maine - Main, jodi.randall@maine.edu

Follow this and additional works at: http://digitalcommons.library.umaine.edu/etd
Part of the International and Community Nutrition Commons

Recommended Citation
Randall, Jodi L., "Preparing for Effective Program Dissemination and Implementation: An Analysis of Problems and Proposals for the iCook 4-H Program" (2016). Electronic Theses and Dissertations. 2548.
http://digitalcommons.library.umaine.edu/etd/2548

This Open-Access Thesis is brought to you for free and open access by DigitalCommons@UMaine. It has been accepted for inclusion in Electronic Theses and Dissertations by an authorized administrator of DigitalCommons@UMaine.
PREPARING FOR EFFECTIVE PROGRAM DISSEMINATION AND IMPLEMENTATION: AN ANALYSIS OF PROBLEMS AND PROPOSALS FOR THE iCOOK 4-H PROGRAM

By

Jodi L. Randall

B.A. University of Maine, 2012

B.S. University of Maine, 2014

A THESIS

Submitted in Partial Fulfillment of the Requirements for the Degree of Master of Science (in Food Science & Human Nutrition)

The Graduate School

The University of Maine

December 2016

Advisory Committee:

Adrienne A. White, Professor of Human Nutrition, Advisor

Angela Myracle, Assistant Professor of Human Nutrition

Kathryn Yerxa, Associate- Extension Professor
While much effort has gone into the creation of obesity prevention programs like iCook 4-H, such programs remain largely under-utilized. The disconnect between research and practice highlights the necessity of dissemination and implementation strategies to ensure programs become adopted into practice. Creating a well-informed systematic approach to implementation will ensure that the iCook 4-H program will be implemented efficaciously and sustainably to improve the health of generations to come. The goal of this research was to implement the pilot dissemination and describe the findings in the context of the Quality Implementation Framework. The objectives were to report outcomes of the iCook 4-H pilot dissemination, identify factors that promoted or inhibited successful dissemination, and provide suggestions QIF-based suggestion for improvement of future iCook 4-H dissemination and implementation.

Careful attention to detail was paid in earlier stages of the iCook study while developing the iCook 4-H three-pronged approach of program, process, and fidelity evaluation to be consistent and
reliable over time. This system of evaluation generates data on effectiveness of the iCook program (which was addressed in the iCook intervention study). In the context of dissemination and implementation, it also illuminates the successes and failures in program packaging and determines if actual program delivery aligns with intended program delivery. Process evaluation results of the iCook 4-H pilot dissemination showed that both youth and adult participants identified the key components (concrete as well as abstract) of the program which is an indicator of efficacy. Program evaluation analysis demonstrated significantly increased scores from pre to post intervention in overall outcome measures (and the majority of youth subscales) 87.44±10.57 to 90.89±6.98 in adults and 180.26±29.74 to 200.10±28.67 in youth. Fidelity evaluations demonstrated that sites maintained high attendance (average of 91%) and participants were highly engaged in sessions (session averages of 3-4 on a 1-4 scale). Through third-party fidelity assessment, leaders were categorized as effective to highly effective (3.3-4 on a 1-4 scale) and were able to cover session materials and meet objectives within or below the intended session duration. Based on this assessment, the resources provided to leaders were deemed sufficient.

While novel and well designed, this three-pronged approach to evaluation was not intended to serve as a complete dissemination and implementation (D&I) plan. Significant exploration into dissemination and implementation strategies and frameworks was not completed prior to the pilot dissemination study. By evaluating the iCook 4-H pilot dissemination through the lens of the Quality Implementation Framework, a myriad of potential strategies for improvement of iCook 4-H D&I were discovered. Suggested avenues for improvement of future dissemination and implementation include: creation of a resource/needs/fit assessment, creation of a capacity/readiness assessment, generation of multiple iCook curriculum adaptations, creation of materials for marketing the program to potential champions, generating a system for documenting and sharing effective responses to implementation barriers, development of more extensive training for non-Extension staff leaders and new second-tier staff, determining the ultimate hierarchy of staff members and roles of each level, developing a timeline of steps for new site pre-program preparation, developing a timeline of steps for across-site
implementation coordination, establishing mechanisms for timely supportive feedback, providing opportunities for the sharing of experiences and community building between structure levels, and providing opportunities for the celebration of program success.

Ultimately, it is up to the iCook 4-H principal investigation team to determine which strategies should be incorporated into future dissemination and implementation efforts to ensure iCook 4-H continues to be implemented and generates a lasting impact on communities as an evidence-based practice.
DEDICATION

“Your journey has molded you for your greater good, and it was exactly what it needed to be.

Don't think you've lost time. There is no short-cutting to life.

It took each and every situation you have encountered to bring you to the now.

And now is right on time.”

— Asha Tyson

This thesis, the culmination of my academic odyssey, I dedicate to my personal cairns,

the voices in my head, my loving and ever patient parents:

Lou-Ann & Alan Randall

Together you have guided me through sunny meadows and dark forests,
over rugged mountains and down to the sea where you urged me to unfurl my forgotten wings to soar.

You are forever with me, heart and soul, day and night, present or not.

Please know- Every day I didn’t call, every question I never asked;

we spoke, you answered.

You always do.
ACKNOWLEDGEMENTS

This work would not have been possible without the guidance of Dr. Adrienne White, Douglas Mathews and the rest of the iCook team who welcomed me into their midst mid-project, mentored me, and entrusted me with oversight of the pilot dissemination. I would also like to thank:

My thesis committee, Dr. Angela Myracle, and Kathryn Yerxa for their commitment to see this thesis through despite numerous setbacks.

My lab mates, who became family and who offered academic, moral, and emotional support during times of unimaginable stress.

My ex-husband, for his impeccable timing in setting me up to find just how deep my well reaches, how tough a tender-hearted girl can be, and how capable I am at going it alone.

My little trail family, who helped me grow and flourish in countless ways, and the trail maintainers who provide the space and opportunity for such transformations to occur.

My true family, for their boisterous conversation, food, entertainment, and wine which provided much needed morale-lifting breaks.

My friends, without whom I can honestly say I would not have survived the last two years. I have certainly been blessed to find so many friends with such devotion.

And finally, the man who became my greatest cheerleader and diffuser of anxiety. Wherever this life may lead, you will forever claim a calming presence in my soul.
# TABLE OF CONTENTS

DEDICATION

ACKNOWLEDGEMENTS

LIST OF TABLES

LIST OF FIGURES

INTRODUCTION

LITERATURE REVIEW

Need for Dissemination and Implementation

Dissemination and Implementation Science

Evaluation in Dissemination & Implementation Studies

Quality Dissemination & Implementation

Quality Implementation Framework

ICook Program Overview

Study Justification and Aim

METHODS

Goals and Objectives

Study Design

Timeline of Study

Participants

Intervention

Training

Instruments

Program Evaluation

Process Evaluation

Fidelity of Implementation Evaluation

Data Analyses
LIST OF TABLES

Table 1 Pilot Dissemination Timeline ................................................................. 16
Table 2 Participant Demographics ..................................................................... 27
Table 3 Program Outcome Evaluation of Youth and Adults ............................... 28
Table 4 Average Attendance and Session Specific Objectives Met Across all Locations and Sessions Evaluated .................................................................................. 31
LIST OF FIGURES

Figure 1 Phases of the Quality Implementation Framework ................................................................. 10
Figure 2 Study Timeline .......................................................................................................................... 14
Figure 3 Most Important Aspect of iCook 4-H According to Youth ....................................................... 29
Figure 4 Most Important Aspect of iCook 4-H According to Adults ...................................................... 29
Figure 5 Most Important Aspect of iCook 4-H According to Leaders .................................................... 29
Figure 6 Youth Descriptions of Family Meals ......................................................................................... 30
Figure 7 Adult Descriptions of Family Meals ......................................................................................... 30
Figure 8 Actual vs. Planned Duration of Sessions Across all Locations and Sessions Evaluated .......... 32
Figure 9 Mean Percentage of Focal Areas Addressed Across all Locations and Sessions Evaluated ....... 32
Figure 10 Participant Engagement Across all Locations and Sessions Evaluated ................................. 33
Figure 11 Leader Effectiveness Across all Locations and Sessions Evaluated ....................................... 34
CHAPTER 1
INTRODUCTION

The world health organization has deemed childhood obesity “one of the most important public health challenges of the century,” and as such, it is of critical concern in the United States.1 Despite the dedicated attention of researchers, policy-makers, and the media, childhood obesity rates remained stable at nearly 17% from 2003-2012.2–5 This figure represents a nearly 300% increase since 1979, a faster rate of increase than that of adult obesity in this time.3,6,7 Studies of obesity incidence indicate that approximately 12% of children become obese between the ages of four and 14.8 Beyond preschool years, the greatest increase in prevalence occurs between the ages of seven and nine, making this age range a particularly important target for maximizing the effect of preventative efforts.5,8 The older end of this range is also an age when children become more independent in developing and solidifying their own dietary and physical activity behaviors.7 Eating and physical activity habits are known to be established early in life and be less susceptible to intervention the longer they have been practiced.9

According to by Surgeon General David Satcher: "Overweight and obesity may soon cause as much preventable disease and death as cigarette smoking."10 Indeed, the health implications of childhood obesity span the lifetime and negatively impact quality of life. Obese children have a greater risk of developing into obese adults, in fact by age 12 approximately 14% of youth already meet the adult criteria for obesity (body mass index of 30 or greater).4,6 Obesity, in youth or adulthood, increases risk of a host of ailments including heart disease, stroke, respiratory ailments, orthopedic problems, arthritis, type II diabetes, and many cancers.3,6,11–13 Obese individuals often also suffer from a variety of social, emotional, and psychological adjustment and coping issues throughout life.3,11,12,14 These mental health problems correlate to lower academic outcomes, reduced skill attainment, and worse labor market outcomes.7,13,14 Overall, these problems and ailments impact the economics of the nation both directly via society borne healthcare costs and indirectly via wage loss due to obesity-related physical and mental illness as well as premature mortality.3,10–16 The office of the Surgeon General estimated these costs at approximately $117
billion in 2000 and $147 billion in 2008. While results of cost of illness studies vary, some estimate the annual US outpatient healthcare cost of obesity in childhood alone to be as much as $14 billion (based on comparison of annual healthcare outpatient expenditure for obese versus normal weight youth).

Obesity has been described as an intricate web of entwined societal and biological factors. Among the factors contributing specifically to the childhood obesity epidemic are a lack of parental nutrition education, increasing sedentary lifestyles, and a high availability and low cost of calorically dense foods. Further complicating the situation is the increasing percentage of meals commercially prepared and eaten outside of the home, the decreasing percentage of meals prepared fresh and eaten in the home, and the increasing portion sizes in both environments. Finding time for meal planning, food preparation, and family-focused mealtimes is also difficult for many of today’s working parents. Even schools are finding it difficult to devote time to nutrition education and physical activity, with only 4.2% of schools nationwide requiring daily physical education and 62-74% implementing recess for all grade-levels. Parental practices surrounding food and physical activity in regards to teaching, monitoring, and/or regulating the child, as well as role modeling have been associated with child habits and weight status. Logically, it follows that parental involvement in obesity prevention and intervention programs for children enhances outcomes. Research has also suggested that community-based programs designed to impact multiple factors are the most effective way to address the obesity problem.

The iCook 4-H program is a non-diet approach to obesity prevention in youth designed to improve culinary competence, enhance basic nutrition knowledge, increase physical activity, and develop family communication and involvement around meals. This preventative healthcare program was developed using a community-based participatory research (CBPR) approach, integrating research and extension via 4-H programming. iCook follows the 4-H approach of “learn by doing,” engaging participants in hands-on learning about healthful lifestyles through skill building activities in each of the aforementioned areas. Participants, 9-10 year-olds and their primary adult meal preparers (henceforth
referred to as dyads), were asked to interact together during sessions and between sessions in their home environment. This dyad approach was used to provide reciprocal role modeling in and out of the sessions for enhancement of skill building.

The iCook 4-H intervention study was implemented in five states over a two-year period between 2013 and 2015 and was to be followed by the dissemination study. This stage of the study evaluated the effectiveness of the icook curriculum. The focus of the current research is the iCook 4-H pilot dissemination study conducted during the fall of 2014 in preparation for the dissemination study. The dissemination pilot was intended to test the proposed means of disseminating the program and serve as an intermediary step in the transition to researcher-hands-off program implementation. While the pilot dissemination followed the systematic method of evaluation that was developed and tested throughout the intervention study, this was not intended to provide further data on effectiveness, rather to model and trouble-shoot how evaluations were to be performed in the final stage of the study.

While obesity prevention programs like iCook 4-H have been previously developed, tested, and scientifically supported as both salubrious and cost-effective, they are largely under-utilized. In fact, in the realm of health care, it has been reported that the average gap between the establishment of an evidence-based practice (EBP) and its utilization as common convention is 17 years. This disconnect between research and practice puts into stark relief the necessity of a well-planned dissemination and implementation for efficacious programs. Implementation influences outcomes; in order to generate change we must ensure the prompt utilization of tested curriculum while maintaining fidelity to the proven program.

The goal of this research was to implement the pilot dissemination and describe the findings in the context of the Quality Implementation Framework. The objectives were to report outcomes of the iCook 4-H pilot dissemination as they related to dissemination and implementation, discuss the program in the context of the quality implementation framework to identify factors that promoted or inhibited
successful D&I, and provide QIF-based suggestions for improvement of future iCook 4-H dissemination and implementation.
CHAPTER 2

LITERATURE REVIEW

“Implementation research is the scientific study of methods to promote the systematic uptake of research findings and other evidence-based practices into routine practice, and, hence, to improve the quality and effectiveness of health services.”

Need for Dissemination and Implementation

Researchers rapidly produce new innovations and understandings which can improve the efficiency and success of health interventions. Outcomes, however, will not improve as rapidly until these new innovations are more swiftly ushered into practice. While it may take an average of 17 years for research-developed programs to become routine practice in the healthcare field, only about 50% of evidence-bases practices (EBPs) ever make it into general practice. Such delayed and irregular uptake of research findings allows for less effective, more costly, sometimes even inappropriate activities to persist long after higher quality methods have been developed. Typically, this disconnect has not been a concern for academic researchers as their career hinges on the generation of effective EBPs, rather than putting them to use. However, around the world, research funding has become increasingly difficult to obtain and maximizing the return value of distributed resources is becoming a priority for funding agencies. Many grant funding agencies have begun to require dissemination plans as part of required documentation to support translational research, i.e., moving the work from the research to the community setting.

To this end, dissemination and implementation (D&I) science has emerged as a critical field. An understanding and application of its principles has become essential for researchers across disciplines. Without diligent attention to proven implementation strategies, researchers generate archives of information void of the strategies and tools necessary to ensure their use for change. In Rogers’ classic model of diffusion of innovation, as described by Meyers, dissemination and implementation are two of five essential stages (dissemination, adoption, implementation, evaluation, and institutionalization) which
are necessary to bridge research into outcomes.\textsuperscript{29} Quality D&I techniques are, simply put, a natural pair for quality research.

The importance of D&I has been recognized by several prominent research agencies and researchers at these agencies have taken on the charge to advance the science as a field. In 2011 thirteen of the 27 institutes of the National Institutes of Health (NIH) were funding research to “identify, develop, and refine effective methods for disseminating and implementing effective treatments” and in 2010 the Centers for Disease Control (CDC) was actively attempting to improve program implementation within both “existing and developing health systems infrastructures.”\textsuperscript{29} Within the National Health System of the United Kingdom, the newly formed National Institute for Health Resources (NIHR), has the sole purpose of studying “methods to translate implementation research evidence into practice” to improve national health outcomes through the use of existing research.\textsuperscript{29}

**Dissemination and Implementation Science**

Through dissemination and implementation science, researchers have provided a myriad of techniques to identify and address potential barriers to and mediators of program adoption and institutionalization. Dissemination is the spread and distribution of information about an intervention, as well as materials required for the intervention, to a targeted audience. Dissemination science is the study of how intervention information and materials are designed, packaged, and proliferated, and how the details of such activities affect the interpretation of and fidelity to the EBP by stakeholders.\textsuperscript{27,31}

Implementation is the method by which research findings are integrated into general practice and/or policy. Implementation science is the study of these methods to promote and improve such integration. The ultimate goal of implementation science in healthcare is to improve the quality and effectiveness of practice by increasing the adoption and sustainability of research-generated EBPs.\textsuperscript{27,31} In order to accomplish this, implementation scientists take into account social, behavioral, environmental, and economic factors. These factors affect a practice’s likeliness of being considered and chosen for use, continuously and sustainably used, and used in such a manner that it maintains a reasonable degree of
fidelity while maximizing effectiveness in a variety of real-world settings.\textsuperscript{31} The scope of the field goes beyond traditional patient/participant effectiveness research to account for all stakeholders: patients/participants, providers/teachers, organizations/communities, and even policy makers.\textsuperscript{27} Together, dissemination and implementation studies provide insight and enhancement to the future dissemination and implementation of programs.

Typical academic research of EBPs consists of efficacy trials and effectiveness trials. Efficacy trials investigate benefits of a study under conditions that are highly controlled by researchers while effectiveness trials examine impact of interventions in circumstances that more closely resemble real-world situations.\textsuperscript{32,33} Both types of trials are intended to establish the connection between the intervention or EBP and a desirable outcome but do not, in and of themselves, guarantee that the established EBP will culminate in public health impact.\textsuperscript{32,33} Dissemination and implementation trials on the other hand, are intended to determine if the current packaging of information and proposed implementation methods will result in the intervention or EBP being adopted and sustained.\textsuperscript{27} While efficacy trials are conducted with a high degree of researcher effort to maintain exact conditions, and effectiveness trials somewhat limit researcher input, trials of the dissemination and implementation of an EBP can only be considered valid if they are conducted in un-manipulated real-world settings.\textsuperscript{27,32} Likewise, while effectiveness and efficacy studies rely heavily on the impetus and external funding of the research team, trials of EBP dissemination and implementation must strive to determine the likeliness of the EBP being used efficaciously by stakeholders without researcher intervention and funding.

A study design which combines both efficacy/effectiveness and dissemination/implementation trials is perhaps the most robust design to ensure efficacious EBPs are well equipped with dissemination material, support, and reach to generate wide-spread change. The hypotheses proposed in such designs regard both the EBP’s (health status) outcomes and its implementation (processes) outcomes.\textsuperscript{27} By establishing both lines of inquiry from project conception, these hybrid designs allow researchers to keep an eye on the ultimate goal throughout the process. This reduces the risk that an EBP with little
applicability to diverse real-world settings will be produced. Having the long-range goal of wide-spread implementation in mind also prompts researchers to note and predict potential D&I barriers as they run initial efficacy and effectiveness trials. Finally, a hybrid design gives the research team the opportunity to ensure that those who run the efficacy and effectiveness trials (and hence understand the program and the components essential to its performance) are also active in overseeing D&I trials. This is imperative for maintaining quality outcomes whilst executing quality implementation.

**Evaluation in Dissemination & Implementation Studies**

Evaluation plans are a central component of dissemination and implementation. Only through quality evaluation can researchers determine if their EBP is being implemented in the way that it was intended and having the anticipated impact. Evaluation data can be collected from a variety of sources including patients/participants, champions, any member of the staffing hierarchy, and community members. Data can also be distilled from the implementation environment (physical, mental, political, and economic). Data can be both quantitative and qualitative and may be collected through surveys or other assessment tools. Types of evaluations include: program outcome evaluations, process evaluations, and fidelity evaluations. Program outcome evaluations measure the outcome or impact of the program through program content-specific questions. Process evaluations identify successes and failures in the process of delivering the program to illuminate means by which the program can be strengthened to potentially improve outcomes. Fidelity evaluations determine if actual program delivery aligns with intended program delivery by assessing structural/organizational components (timing, attendance, adequate provision of materials) and instructional components (quality of leader/participant interactions, participant engagement). Numerous other evaluations can be created to assess any aspect of the dissemination and implementation of a program.

**Quality Dissemination & Implementation**

Implementing and sustaining an evidence-based program is a complex process into which a great deal of thought must be placed. Even with a well-planned strategy, a number of barriers may be
encountered during the execution of a dissemination and implementation plan. Some of these barriers will be foreseeable and hence can be prepared for, while others will not and must be addressed as they arise. The development of a proactive monitoring system allows stakeholders the opportunity to identify challenges as they arise so that they can react in a timely and appropriate manner. A few common implementation impeding barriers to be aware of include: competing demands for the time of staff members, deflating motivation or attitude of staff members over time, program scheduling difficulties, decreased intervention dose of participants with drop-outs and no-shows, lack of financial support for sustainability, and lack of technology transfer and updating.

Suggestions and improvements for dissemination and implementation can come in the form of individual interventions (a single method or technique to promote change) or frameworks (integrated sets of interventions). While there are many frameworks for D&I in existence, the goal of this research is not to determine a particular framework of best fit for iCook 4-H to use. Rather, this researcher (referred to during the iCook program and henceforth in this document as the coordinator) seeks to provide an a la carte source of suggestions which bear relevance to the improvement of the current D&I plan for the iCook 4-H program. To this end, the coordinator has chosen to focus on the work of a research group who have synthesized and integrated existing frameworks. This group’s sources cover a broad array of existing D&I literature and provide an extensive assortment of intervention options.

**Quality Implementation Framework**

Meyers, Durlak, and Wandersman analyzed 25 existing implementation frameworks and synthesized them into a single, non-field-specific “meta-framework.” This they have called the Quality Implementation Framework (QIF). It identifies 14 essential action steps which can be broken down into four phases: 1) Initial Considerations Regarding the Host Setting, 2) Creating a Structure for Implementation, 3) Ongoing Structure Once Implementation Begins, and 4) Improving Future Applications. Each of the steps selected for the QIF was described by multiple frameworks. Meyers, Durlak, and Wandersman suggest that their framework has the potential to be used broadly in a variety of
feilds as a blueprint for turning future research into practice. This framework, modified from Meyers and colleagues’ work is presented in figure 1.

Figure 1 Phases of the Quality Implementation Framework

Adapted from Meyers DC, Durlak JA, Wandersman A. Dynamic interplay among the critical steps of the QIF. The arrows from one phase to the next are intended to suggest that the steps in each of the phases should continue to be addressed throughout the process. Steps in each of the phases may need to be strengthened, revisited, or adapted throughout the process of continued dissemination and implementation.

The Meyers, Durlak, and Wandersman describe their meta-framework in conjunction with the interactive systems framework (ISF). The ISF focuses primarily on the human infrastructure and team systems which are necessary for dissemination and implementation to occur in real-world settings. It describes the responsibilities and actions of three team systems: the synthesis and translation system, the support system, and the delivery system. The goal of the synthesis and translation system is to “translate theory and evidence into user-friendly evidence-based practice.” They are the researchers and stakeholders who create manuals, guides, worksheets, or other tools to make the information more accessible and to support dissemination. They generate strategies for the implementation of the program.
The delivery system then puts the work of the synthesis and translation system into practice. They are the individuals or organizations that actually employ the developed strategies. Finally, the support system acts as a quality assurance team. They provide training, technical assistance, and monitoring to “build and maintain capacity for implementation” in the delivery system. This increases the chances that desired outcomes will be achieved. Meyers, Durlak, and Wandersman facilitate how these systems work together and smooth the path to effective implementation via their action-oriented steps of the QIF.

The QIF is composed of multiple phases with each phase encompassing several steps. QIF implementation phase one consists of “the initial considerations regarding the host setting assessment strategies” and encompasses the first eight action steps of the framework. These steps are best completed prior to any attempt at dissemination and/or implementation. The first of these steps is to “conduct a needs and resource assessment of the host setting.” It is important to determine that the host site will indeed benefit from the implementation of the program. Researchers must ask why the host site is interested in the program, what they hope to gain from it, and who they believe will benefit. If the host’s answers do not align with the researcher’s intended audience and impact, the program is perhaps not needed at the site. Since this (and some following) step(s) will be repeated at each new site as implementation continues it is important to determine at this point how such assessments will be validly completed and by whom once researchers are no longer involved with the project. The second step is to “conduct a fit assessment.” This assessment seeks to determine how well the innovation or program matches the previously identified needs of the host, what the cultural preferences of those served at the host site are, and if the program can meet those preferences to maintain high participant involvement and retention. The third step is to “conduct a capacity/readiness assessment.” This step will explore the degree to which the host has both the resources and (equally important) the will and motivation to implement the program. It also assesses the host organization or communities’ readiness for change. Depending on the program, it may also be necessary to measure staff proficiency of necessary skills. Step four is to make “decisions about adaptation” and “capacity building strategies.” The goal of this step is to determine
whether the program/intervention should be modified to better fit the host setting or site-specific participants. This requires discourse between the research team and the host staff to ensure alterations that improve participant experience while maintaining program fidelity. If adaptations are made it is important to document these changes, the reasons for them, and to develop a plan to monitor their impact during implementation. Step five of phase one is to “obtain explicit buy-in from critical stakeholders and foster a supportive climate.” The first part of this step could also be referred to as “gaining a champion.” A project champion is a non-researcher organization/community member who is in a position of leadership, has both inspirational and decision-making power, and is genuinely convinced of the need to implement the program in their community. The second part of this step (fostering a supportive climate) is accomplished when researchers and champions have effectively addressed concerns, questions, resistance, and barriers to the implementation. It may also involve the creation of strategies such as incentivizing staff to make use of the program. Step six is to “build general/organizational capacity”. In this step the “infrastructure, skills and motivation of the host organization/community are assessed” and suggestions for enhancements that may positively affect the quality of implementation are made. Step seven is the recruitment and maintenance of staff. While the front-line staff may need no prior understanding of the program, they will need training and support to implement it adequately. Staff members with prior knowledge of the program/innovation, its use, implementation science, and process evaluation must be procured to act as trainers and support for the front-line. The final step in phase one, step eight, is “effective pre-innovation staff training.” This step is where the second tier staff must provide adequate training to the front-line staff. Training must ensure an understanding not only of the basic procedures of implementation but also of the theory behind, and values of the program. It must also cover the skill-based competencies necessary for the practitioners to deliver the program accurately, effectively, and confidently.

Phase two focuses on “creating a structure for implementation” and encompasses the next two action steps of the framework. Step nine is “creating implementation teams.” This is where the support system is solidified. The roles and responsibilities of support staff must be determined and, in the case of multiple implementation sites, one of these staff must step up as an organizational leader for the overall
implementation. Step 10 is “developing an implementation plan.” In this step, a clear and direct plan of action is laid out to ensure specific tasks are completed within the confines of an implementation timeline. The goal is to improve accountability of team members during implementation and to be aware of and prepared to face potential challenges.

The three steps of phase three regard “ongoing structure and support strategies once implementation begins.” Step 11 addresses the necessary “technical assistance/coaching supervision” as implementation progresses. Support staff must be available to provide adequate assistance to deal with operational problems as they arise. Step 12 is “process evaluation.” This step addresses the plan and tools to evaluate strengths and shortcomings in the implementation and how they evolve over time. Data collected in this step will describe the performance of staff in conducting aspects of implementation. Step 13 is the creation and use of a “supportive feedback mechanism.” Researchers must develop a system by which findings from evaluations that are relevant to front-line staff, support staff, and stakeholders can be efficiently “distributed, discussed, and acted upon.” This type of communication promotes skill development and organizational growth and can lead to quality improvement over time.

Phase four, the phase of “improving future applications” consists of a single step. Step 14 is simply “learning from experience.” In this step, all involved parties collaborate to reflect on the implementation. The constructive feedback from the perspectives and experiences of every level of organization can be used to improve future iterations of implementation. Topics of discussion may include such things as the use, modification, or application of the innovation and factors that may have affected the quality of implementation.

ICook Program Overview

The iCook 4-H program was conceived by a multistate research group with principal investigators located at the University of Maine, University of Nebraska, South Dakota State University, University of Tennessee, and West Virginia University. The research was supported by a grant from the National Institute of Food and Agriculture, U.S. Department of Agriculture, and state experiment stations
in Maine, Nebraska, South Dakota and West Virginia. Spanning five years, the iCook 4-H study consisted of four distinct phases; pilot intervention, interventions study, pilot dissemination, and dissemination study. This evolution is depicted in Figure 2. A three-pronged approach to evaluation was used, including program outcome, process evaluation, and fidelity evaluation.\textsuperscript{34}

Figure 2 Study Timeline

Study Justification and Aim

Piloting the iCook 4-H Dissemination Study helped to aid and improve the future dissemination and implementation of the program. When D&I techniques are successfully incorporated, effectiveness and fidelity are able to be maintained, and a program can be implemented with a broader reach and increased sustainability.\textsuperscript{28,29} The results are to maximize the return on investment of resources from funders and ensure beneficial outcomes for participants for years to come. Creating an effective and lasting childhood obesity prevention program which addresses the issues of poor parental nutrition education, increasing sedentary lifestyles, high availability and low cost of calorically dense foods, and difficulty finding time for meal planning and food preparation is a huge step toward the improvement of American public health. The aim of this research was to implement a pilot of the dissemination and describe the findings in the context of the Quality Implementation Framework.
CHAPTER 3

METHODS

Goals and Objectives

The goal of this research was to implement the pilot dissemination and describe the findings in the context of the Quality Implementation Framework. The objectives were to:

- report outcomes of the iCook 4-H pilot dissemination as they relate to dissemination and implementation
- discuss the program in the context of the quality implementation framework to identify factors that promoted or inhibited successful dissemination
- provide QIF-based suggestions for improvement of future iCook 4-H dissemination and implementation

Study Design

The research design was a one group, pre- post- pilot test for the dissemination of the iCook 4-H study. Assessments consisted of a three-pronged evaluation of the study sample which were nine and ten-year-old youth and their primary meal preparer. Program evaluation (prong one) occurred at zero and four months for the dyads. Process evaluation (prong two) occurred following each of the eight sessions of the intervention and was collected from both members of the dyad and the session leaders to gather formative feedback on a session by session basis. Fidelity of implementation evaluation (prong three), to test how the actual implementation of the intervention compared to the planned implementation, was planned for 25% (n=10 sessions) and carried out by volunteer Cooperative Extension staff or graduate students. The number was based on the expected number of sessions (eight sessions x five states = 40 sessions). The intervention, designed for dyads to cook, eat, and play together, was led by iCook researcher-trained Cooperative Extension educators across the three states (Maine, Nebraska, and Tennessee) where the pilot took place. All methods were approved by the Human Subjects Institutional Review Board for each participating states.
Timeline of Study

Presented in the following table is the timeline for the pilot study. It includes the time for training, program implementation, and three-pronged evaluation components.

Table 1 Pilot Dissemination Timeline

<table>
<thead>
<tr>
<th>Pilot Dissemination Activities</th>
<th>May to December 2014</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
</tr>
<tr>
<td>Train Educators for Pilot Dissemination</td>
<td>X</td>
</tr>
<tr>
<td>Readiness Assessment Form Completion</td>
<td></td>
</tr>
<tr>
<td>Implementation (Test of training and material adequacy)</td>
<td></td>
</tr>
<tr>
<td>Program Evaluation</td>
<td>X</td>
</tr>
<tr>
<td>Program Evaluation Analysis &amp; Distribution</td>
<td></td>
</tr>
<tr>
<td>Process Evaluation</td>
<td>X</td>
</tr>
<tr>
<td>Process Evaluation Analysis &amp; Distribution</td>
<td></td>
</tr>
<tr>
<td>Fidelity Evaluation</td>
<td>X</td>
</tr>
<tr>
<td>Fidelity Evaluation Analysis &amp; Distribution</td>
<td></td>
</tr>
</tbody>
</table>

Participants

A convenience sample of nine and ten-year-old youth and their main food preparer participated in the study. The expected sample size was 30 dyads, six dyads per state. Eligibility criteria included age, ability to participate in the 16-week study, no life-threatening illness of other conditions and/or activity related medical restrictions that would prevent participation in a face-to-face nutrition and fitness program, no dietary restrictions (specifically to meat and dairy), and regular access to the internet.
**Intervention**

Consistent with previous iterations of the intervention program, the pilot dissemination’s six core sessions were each comprised of a food/nutrition focus, culinary skill development (training followed by hands-on cooking experience), a physical activity exercise, a family communication activity, and personal goal setting. Two additional sessions were added as session 1 and session 8 to incorporate the consent protocols, technology training, and program outcome surveys without impeding on valuable session time. A table of session components can be found in Appendix A. Dyads were asked to make use of their new culinary skills and be physically active at least twice per week between the bi-weekly sessions. Participants were given access to a closed, secure, social networking style website for active sharing of videos, pictures, and experiences to demonstrate their involvement in cooking, physical activity, and mealtimes at home. Youth received digital cameras with video capacity for this purpose which they were able to keep following completion of the program. The dyads also received $10 to purchase food for their at-home cooking activities and as incentive to increase these activities and reduce drop-out rates.

**Training**

The coordinator was mentored and trained by Douglas Mathews, a University of Maine doctoral student at the time, who had been involved with the iCook 4-H Program since its inception. Training included instruction in the use of Qualtrics survey software (http://www.qualtrics.com) for collection of participant evaluations which were in the form of electronic surveys administered through this program. The coordinator was also trained in the use of the SPSS software program (Version 22, Armonk, NY: IBM Corp.) for statistical analysis of the evaluation data collected via Qualtrics. Familiarization with the curriculum was accomplished through readings and attending leader trainings that occurred within the state and across the five participating states. Web-based research ethics training through the Collaborative Institutional Training Initiative (CITI) for the protection of human subjects was also completed.

Pilot dissemination staff were trained using a combination of verbal communication from the research team and web-based information, instruction, and resources. An extensive repository of iCook 4-
H dissemination materials were housed on a password locked Moodle, which is a course management system, on the Cooperative Extension website (extension.org). Materials included training videos to introduce potential leaders to the program and give an overview of the curriculum. Training videos were also included to instruct leaders in the recruitment of participants, creation of participant accounts on the iCook social website, uploading of participant videos to the website, as well as to explain program and process evaluations and their administration. Links to Institutional Review Board (IRB) training and a required IRB quiz were provided to ensure session leaders were informed of the ethical principles and guidelines they must follow. Also available on the extension.org Moodle were a PDF of the curriculum overview slides; the full pilot dissemination manual; recruitment guides and sample recruitment letters and scripts; session specific leader guides, participant materials, and posters; a site needs inventory sheet; and participant web-login and attendance tracking sheets.

Staff watched the training videos and reviewed all materials individually, making note of any questions or concerns they had regarding the materials and the implementation of the program at their site. Staff were then invited to a multi-modal training session where questions and concerns were addressed, and the curriculum was reviewed once more via a multistate teleconference with screen-sharing. Hands-on training of website and video camera use was later conducted face-to-face at the state level.

**Instruments**

The instruments used for the pilot dissemination were the program, process, and fidelity evaluation tools designed by another iCook researcher to accompany the curriculum. They were termed the iCook 4-H three-pronged evaluation. These instruments were modified by the multistate research team to reflect the 8-session pilot dissemination following the Intervention Study. The instruments were designed to be web-based using Qualtrics software (qualtrics.com).
Program Evaluation

Program outcome evaluation was in the form of pre- and post-program web-based evaluations for both youth and adult participants (Appendices B and C respectively). These evaluations were intended to measure change over time.

The youth instrument (Appendix B) consisted of 11 items of the Cooperative Extension Checklist, 51 Likert-style content questions, and eight demographic/identification questions. Content questions were separated into nine sub-scales as follows:

1) Cooking skills with help- nine questions, scored 1- “never” to 5- “all of the time.”
   Example question: “Can you use a knife to cut foods with help from someone else?”

2) Cooking skills by oneself- nine questions, scored 1- “never” to 5- “all of the Time.”
   Example question: “Can you use a knife to cut foods by yourself?”

3) Willingness to cook and try new foods- three questions, scored from 1- “very unwilling” to 5 “very willing.” Example question: “How willing are you to taste new foods you have not tried?”

4) Self-Efficacy in completing common cooking tasks- six questions, scored, after reverse coding, from 1- “strongly disagree” to 5- “strongly agree”. Example question: “I am sure I can follow a recipe.”

5) Involvement in family meals and preparation- five questions, scored from 1- “never” to 5- “all of the time”. Example question: “How often does your family eat together?”

6) Physical activity- three questions, scored from 1- “never” to 5- “all of the time”. Example question: “How often does your family play actively together?”

7) Goal Setting- two questions, scored 1- “never” to 5- “all of the time”. Example question: “How often do you set healthy goals for yourself?”

8) Technology with help- seven questions, scored from 1- “never” to 5- “all of the time”. Example question: “I can upload videos to YouTube with help from someone else.”
9) Technology by oneself- seven questions, scored from 1- “never” to 5- “all of the time”. 

Example question: “I can upload videos to YouTube by myself.”

The adult program evaluation consisted of an 11-item Behavior Checklist, 25 Likert-style content questions with descriptors ranging from 1=never to 5=always, and additional demographic questions (Appendix C). Based on psychometric testing of the tool, a single scale included items related to cooking, eating and playing together. Example questions included: “How often do you plan your weekly meals?” and “How often do the topics of conversation at mealtimes include all family members?”

**Process Evaluation**

Youth and adult process evaluations (Appendices D and E, respectively) were designed to assess session-specific knowledge acquisition and between-session goal compliance (cooking, eating, and being physically active together). They were also a source of feedback regarding sessions. The youth process evaluations were four to five questions in length and the adults’ were four to six questions. These evaluations were also web-based and were administered following sessions two through seven (core content sessions).

Goal compliance questions (“How often did your family eat together during the last two weeks?”, “How often were you physically active for more than 60 minutes each day during the two weeks?”) were the same for youth and adults and were asked at each administration. Session-specific questions differed based on session content and between youth and adult evaluations. Examples include: “How safe do you feel using a knife?” (youth, scored from 1- “Not at all” to 5- “Very”) and “How likely are you to change the fat used in a recipe?” (adult, scored from 1- “Not at all” to 5- “Very”). The evaluations culminated in an open-ended question requesting feedback about the session. Participant process evaluation data for each site was downloaded, de-identified, and data were compiled on a site-by-site basis then returned to corresponding site leaders after each session. The feedback was used to modify program delivery as needed throughout the program.
Leader process evaluations (Appendix F) were also web-based and consisted of the same five questions following each session to assess session attendance, adequacy of materials provided, further material needs, and appropriateness of session objectives to needs of both adults and youth. Additional questions were posed following the final session to determine the appropriateness of materials for the program as a whole and the appropriateness of sessions as a whole for meeting the needs of adults and youth. Finally, leaders were asked to describe what they thought went well and what they thought could be improved with the sessions. Leader process evaluation data were downloaded by the coordinator at the end of the program for statistical analysis.

**Fidelity of Implementation Evaluation**

The purpose of the fidelity evaluation was to assess how closely actual implementation resembles intended implementation. Individual components of each session were accounted for and assessed. Fidelity of implementation evaluations (sample found in Appendix G), scheduled for 25% of sessions spread evenly between locations and session numbers, were conducted by impartial program partners. These volunteer evaluators were Extension Educators or graduate students and were selected in each state by principal investigators. iCook researcher-trained evaluators were assigned specific sessions to assess and were provided with the corresponding session–specific fidelity evaluation tools. Evaluations were completed by observing sessions without interacting or influencing the course of the session. Fidelity evaluators indicated: actual vs expected attendance, actual vs expected session length (in minutes), actual vs expected activity length (in minutes), objective completion (yes or no), adult interest in session (four-point scale from 1-“little” to 4-“active” engagement), youth interest in session (four-point scale from 1-“little” to 4- “active” engagement), leader effectiveness (four-point scale from 1-“very ineffective” to 4-“very effective”), leader reference to guides and materials (five-point scale from 1- “never” to 5- “always”), program elements covered, adequacy of materials for session (yes or no), and missing materials. All questions were the same for each session except timing and completion of objectives, which were session specific (e.g., in session one evaluators were asked to provide the length of time
required to complete technology training). Evaluator demographics (age, gender, and job title) were also collected.

**Data Analyses**

Statistical analyses of the data were completed by the coordinator using SPSS (version 22) (IBM Corporation © 2013). A p-value of 0.05 was considered significant in paired sample t-test analysis of numerical data. Descriptive statistics were computed for categorical data. For program outcome evaluation, pre and post differences for youth and adults were assessed using paired sample t-tests. Full instrument scores of the Likert scale program evaluation questions were completed by summing all responses of each individual. Reverse coding was completed, as needed. Youth subscales were computed independently. The Cooperative Extension Checklist will not be described in this study as it had not been analyzed at the initial time of writing. Furthermore, the program outcome evaluations of the iCook study were evaluations of effectiveness. Effectiveness was established in the intervention study and is not of main concern in the analysis of the pilot dissemination from the perspective of dissemination and implementation studies. For the process evaluation, responses to selected open-ended questions (qualitative data) were thematically coded across the sessions by sorting responses into themes of closely-related and similar meaning words and phrases. The number of like responses were counted by the coordinator and verified by another iCook-researcher. The response themes were entered into Wordle (http://www.wordle.net) to generate word clouds. Word clouds are a method for visualizing descriptive statistics in which the size of words displayed corresponds to the frequency of that response theme. For fidelity of implementation, responses of evaluators were combined and mean scores or percentages were computed by session for visual comparisons. Demographic data were analyzed with descriptive statistics. Jon Moyer, of Husson University, served as the statistical consultant.

**Informal Data Collection through Coordinator-Leader Communication**

Qualitative feedback about program progression and leader needs was garnered by the coordinator through email, text, and phone communications with the leaders over the course of the
program. Such communications were leader initiated and directed and were considered important to collect for facilitating effective future dissemination. Topics included technological issues such as website access problems, password resets, and video upload directions. In keeping with the researcher hands-off intent of dissemination studies, coordinator initiated communication was limited to discourse regarding the timely completion of evaluations. Leaders were to use the resources provided to facilitate their lessons and answer their questions, then provide feedback on the resources adequacy via evaluations. They were not to rely on iCook researchers for every question that arose as these researchers will not be involved in implementations of the program beyond the five year scope of the research study.

**Review of the iCook 4-H Program using the Quality Implementation Framework**

While a quantitative, systematic review of the iCook 4-H program was not conducted during the pilot dissemination study, a retrospective review of the program was conducted by the coordinator using the Quality Implementation Framework\(^{14}\) in order to inform the future planning of the full dissemination of the iCook 4-H program. This review is included in the discussion section of the current study. Briefly, the phases of the framework that will be addressed include:

**Phase 1- Initial Considerations Regarding the Host Setting**

Step I: conduct a needs and resource assessment of the host setting

Step II: conduct a fit assessment to determine how well the innovation or program matches the previously identified needs of the host by covering questions like cultural preferences of those served at the host site and income level of local population

Step III: conduct a capacity/readiness assessment to explore the degree to which the host has both the resources and (equally important) the will and motivation to implement the program, to assess the host organization or communities’ readiness for change
Step IV: make decisions about adaptation and capacity building strategies to determine whether the program/intervention should be modified to better fit the host setting or site-specific participants.

Step V: obtain explicit buy-in from critical stakeholders and foster a supportive climate which requires gaining a champion or champions for the program.

Step VI: build general/organizational capacity by assessing the infrastructure, skills and motivation of the host organization/community and making suggestions for enhancements that may positively affect the quality of implementation are made.

Step VII: recruit and maintain staff.

Step VIII: provide effective pre-innovation staff training.

Phase 2- Creating a Structure for Implementation

Step IX: create implementation teams.

Step X: develop an implementation plan.

Phase 3- Ongoing Structure Once Implementation Begins

Step XI: address the technical assistance/coaching/supervision needed for implementation progression.

Step XII: establish process evaluation including the plan and tools to evaluate strengths and shortcomings in the implementation and how they evolve over time.

Step XIII: create and use a supportive feedback mechanism.
Phase 4- Improving Future Applications

Step XIV: learn from experience; as dissemination occurs, use feedback from prior implementation sites to allow continuous improvement of the dissemination and implementation strategies.
CHAPTER 4

RESULTS

There were a total of six participating groups across three states (Maine, Tennessee, and Nebraska) each consisting of two to six participant dyads for a total of 27 dyads. Session leader recruitment difficulties resulted in non-participation of one state (South Dakota) while the final state (West Virginia) ran the program over a different time span with a modified protocol for integration with the Health Sciences Technology Academy (HSTA) program. These data were not included in the analyses described here.

Program

Basic demographics of participants are displayed in Table 2. Youth were approximately one-third male and two-thirds female with a mean age of 10 ± 0.91 years. Youth spanned grades three through six with a majority (79%) in grades four or five. Adults were 89% female and 11% male with a mean age of 42.4 ± 8.9 years. The majority were employed (72%) and held a degree in higher education (75%). In this sample population 89% of adults were married.
N= 27 dyads

Program outcomes are depicted in Table 3. Both youth and adults demonstrated significantly increased scores in overall program outcome measures from pre- to post-test. Youth increased significantly (p < 0.05) from 180.26 ± 29.74 to 200.10 ± 28.67 on a summative scale of 51-255. Adults increased significantly (p < 0.05) from 87.44 ± 10.57 to 90.89 ± 6.98 on a summative scale of 25-125. Youth also demonstrated significantly (p < 0.05) increased scores in the subscales for cooking by themselves (25.88 ± 5.84 to 29.55 ± 6.84), cooking with help (31.86 ± 9.54 to 38.07 ± 9.00), cooking skill self-efficacy (23.26 ± 3.94 to 25.64 ± 3.43), and using technology with help (25.69 ± 7.84 to 30.45 ± 6.44). There was also a trend in increasing goal creation from 5.86 ± 2.10 to 7.06 ± 1.54 (p=0.088).
Table 3 Program Outcome Evaluation of Youth and Adults

<table>
<thead>
<tr>
<th></th>
<th>Pre-Treatment (mean ± SD)</th>
<th>Post-Treatment* (mean ± SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adult Total Scale†</td>
<td>87.44 ± 10.57</td>
<td>90.89 ± 6.98</td>
</tr>
<tr>
<td>Youth Total Scale†</td>
<td>180.26 ± 29.74</td>
<td>200.10 ± 28.67</td>
</tr>
<tr>
<td>Cooking Skills- By Self</td>
<td>25.88 ± 5.84</td>
<td>29.55 ± 6.84</td>
</tr>
<tr>
<td>Cooking Skills- With Help</td>
<td>31.86 ± 9.54</td>
<td>38.07 ± 9.00</td>
</tr>
<tr>
<td>Culinary Self Efficacy</td>
<td>23.26 ± 3.94</td>
<td>25.64 ± 3.43</td>
</tr>
<tr>
<td>Goal Setting**</td>
<td>5.86 ± 2.10</td>
<td>7.06 ± 1.54</td>
</tr>
<tr>
<td>Technology Skills- With Help</td>
<td>25.69 ± 7.84</td>
<td>30.45 ± 6.44</td>
</tr>
</tbody>
</table>

* Increase in outcome scores from pre to post, based on paired t-tests (p < 0.05)

† Adult total scale included physical activity, cooking confidence and enjoyment, family meals, and dyad interactions with planning and preparing family meals (scale range 25-125)

‡ Youth total scale included culinary skills with and without help, cooking self-efficacy, willingness to try new foods, physical activity, family meals and preparation, goal setting, & technology usage/comfort with and without help (scale range = 51-255)

** Trend in increasing goal creation (P=0.088)

Process

The most important aspects of iCook 4-H as reported by youth are depicted as a word cloud in Figure 3. Common responses included: cooking, new foods, nutrition, physical activity, food safety, and knife skills. Other youth responses of note were self-confidence and togetherness. When the same question was asked of adults, a very different array of responses was received (Figure 4). The most common adult response was togetherness. Others included: child learning, new foods, recipes, child empowerment, and community. In Figure 5 leader responses to this question are depicted. While many leader responses overlapped with those of youth and adults, they also identified tasting, meal planning, kitchen tips, and communication.
Figures 3-5: Compilation of answers over the course of all sessions for open-ended process evaluation question: “What is the most important aspect of iCook 4-H?” from youth, adults, and leaders respectively.

Generated via Wordle.net
When asked to describe their family meals, youth responded overwhelmingly with positive descriptions (Figure 6). The most common themes included: awesome, fun, good, tasty, joyful, enjoyable, and talkative. Adults, when asked the same question also had positive responses in general, however, a few unfavorable aspects of family meals were also expressed with relative frequency (Figure 7). Positive responses included: Fun, enjoyable, togetherness, conversational, and nutritious. Unfavorable responses included: rushed and chaotic.

Figure 6 Youth Descriptions of Family Meals

![Figure 6 Youth Descriptions of Family Meals](image)

Figure 7 Adult Descriptions of Family Meals

![Figure 7 Adult Descriptions of Family Meals](image)

Figures 6 & 7: Compilation of answers over the course of all sessions for open-ended process evaluation question: “How would you describe your family meals?” from youth, and adults. Generated via Wordle.net
Fidelity of Implementation

While fidelity evaluation was scheduled for 25% of sessions spread evenly between locations and session numbers, several evaluators decided of their own volition to evaluate additional sessions and these data were included in the analysis for a total of 38% of sessions evaluated. The average percent attendance and session-specific objectives met for each session, based on reports by the evaluators, are shown in Table 4. Average attendance for the entire course of the program was 91% with four sessions having 100% attendance. Session-specific objectives were met on average 86% of the time.

Table 4 Average Attendance and Session Specific Objectives Met Across all Locations and Sessions Evaluated

<table>
<thead>
<tr>
<th></th>
<th>Session 1</th>
<th>Session 2</th>
<th>Session 3</th>
<th>Session 4</th>
<th>Session 5</th>
<th>Session 6</th>
<th>Session 7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average Percent Attendance</td>
<td>100%</td>
<td>100%</td>
<td>67%</td>
<td>100%</td>
<td>100%</td>
<td>78%</td>
<td>94%</td>
</tr>
<tr>
<td>Average Percent of Objectives met</td>
<td>86%</td>
<td>83%</td>
<td>75%</td>
<td>88%</td>
<td>100%</td>
<td>78%</td>
<td>93%</td>
</tr>
</tbody>
</table>

Results based on Fidelity of Implementation instrument (Appendix G). Fidelity testing was not completed on session 8.

As shown in Figure 8 all sessions were intended to be 120 minutes in duration. All leaders took longer than the planned time for session one. They tended to take less than the planned time for sessions two through six, however, some leaders took the full 120 minutes for those sessions. On average leaders took the full 120 minutes for session seven, however, some did require additional time.
Figure 8 Actual vs. Planned Duration of Sessions Across all Locations and Sessions Evaluated

Results based on Fidelity of Implementation instrument (Appendix G).

The mean percent of each focus area (culinary skills, physical activity, nutrition, family communication, and goal setting) that was completed across sessions is depicted in

Figure 9. Overall session objectives were met 85% of the time. Culinary and nutrient focus objectives were met 100% of the time.

Figure 9 Mean Percentage of Focal Areas Addressed Across all Locations and Sessions Evaluated

Results based on Fidelity of Implementation instrument (Appendix G).
To assess the leader effectiveness, youth and adult engagement was assessed by evaluators. The results of this assessment are shown in Figure 10. Both adult and youth engagement varied throughout the sessions. Mean adult engagement scores ranged from 3.0 (engaged) to 4.0 (actively engaged) and mean youth engagement scores ranged from a low of 2.5 (between somewhat engaged and engaged), at the first session when the study details and use of technology were being addressed, to 4.0 (actively engaged) on a 4.0 scale.

Figure 10 Participant Engagement Across all Locations and Sessions Evaluated

One-item engagement rating for youth and adult, ranging from 1=showed little engagement to 4=actively engaged throughout the session. Results based on Fidelity of Implementation instrument (Appendix G).

Leader effectiveness mean scores are presented, session-by-session, in Figure 11. Mean scores for leader effectiveness in objective and focal area delivery and communication ranged from 3.3 to 4.0 on a 4.0 scale. Evaluators assessed leaders as being effective to highly effective in these areas.
Results of Informal Data Collection through Coordinator-Leader Communication

Throughout the pilot dissemination the coordinator acted as a help desk. The common problems that leaders required help for were related to the technology aspect of iCook 4-H. Leaders lost their passwords to the website and participants did not always complete process evaluations on site following sessions. At some sites, there was not adequate technology for the duration of the program. Participants were asked to complete evaluations at home, but they often did not. The coordinator had to prompt leaders to remind participants to complete evaluations.
CHAPTER 5

DISCUSSION

While from the inception of the iCook 4-H study, the intent of iCook researchers was to disseminate the program, the details for this effort were not defined until the year of the pilot dissemination. Ultimately iCook was designed as a hybrid study including both efficacy/effectiveness trials (pilot intervention & intervention) and dissemination/implementation trials (pilot dissemination & dissemination). Analyzing this plan’s strengths and weaknesses will provide the opportunity to enhance future dissemination and sustain efficacious implementation. Using a three-pronged approach to evaluate iCook did much to inform the efficacy and effectiveness of the program as well as provide iCook researchers with an understanding of strengths and weaknesses in the curriculum and supportive materials. Using the Quality Implementation Framework provided the foundation for a systematic review of the study in preparation for further dissemination testing.

Evaluations & Outcomes

Program

Through program evaluation, iCook 4-H researchers clearly identified and assessed the goals of the program. The program evaluation instrument has been tested for reliability and deemed a reliable means of measuring program-specific outcomes. These measures were used to assess change from pre- to post-test in scores for cooking, eating, and playing together as a family from the beginning to the end of the intervention. The inclusion of evidence-based program evaluations in implementation will provide valid measures of outcomes, which can be used by new and existing proponents of the program to justify program adoption and expansion.

While effectiveness of the iCook 4-H program has previously been established through the intervention study, the significant increases seen in both youth and adult scores serve as evidence that the iCook 4-H program remained effective as it was delivered during the pilot intervention. Youth increased
scores in the subscales for cooking by themselves, cooking with help, cooking skill self-efficacy, and using technology with help; and trended toward increasing goal creation scores. Self-efficacy related to cooking and nutrition knowledge is associated with improved dietary behavior. Scores in the subscales for technology skills without help, willingness to try new foods, physical activity, and family meals and preparation did not change from pre to post test. It is possible that youth in this age group are simply not allowed by parents to access the Internet on their own and hence no increases in their ability to do so were exhibited over the course of the program. The mean score for the youth willingness to try new foods subscale was between “willing” and “very willing” at pre-test, so there was little room for growth in this area.

**Process**

Participant and leader feedback collected over the course of the program through iCook 4-H process evaluations provided a snapshot of progress across all study sites. Individual leaders were able to use feedback from their own participants to make informed improvements in their delivery of materials, responding dynamically to the needs of their participants to ultimately improve participant outcomes.

Feedback garnered from process evaluations was used to document the learning from, and enjoyment of the program, both in and out of the sessions. In responding to the question of the most important aspect of iCook 4-H, youth tended toward literal, concrete answers (e.g. cooking and physical activity) which highlighted the iCook 4-H core concepts as well as individual lessons. iCook researchers interpreted these responses as evidence that youth really keyed in on the core concepts of the program and that the sessions were delivered adequately to convey the intended message. While there were some similar responses from the adults when asked the same question, adults tended to be more abstract as evidenced by responses like “togetherness,” “child learning,” and “child empowerment.” These themes were also essential to the iCook 4-H program and were interpreted as further evidence of program efficacy. Youth and adults alike reported overwhelmingly favorable family meal experiences. The descriptors used indicated that family meals were a time of positive family interaction and
communication. These valuable experiences may lead to increased family meal frequency from which they will gain other benefits in-line with the goals of iCook 4-H.38

**Fidelity**

While fidelity evaluation was conducted on more sessions than originally intended, these evaluations were conducted by trained fidelity testers who followed protocol for use of the instruments. This additional fidelity data was accepted by the iCook research team as relevant and valid and hence incorporated into analysis. Based on the findings of these fidelity evaluations, the iCook 4-H program was implemented with fidelity. While average attendance varied across sessions, overall attendance was high with a mean of 91% attendance and four sessions with 100% attendance. This rate of attendance is higher than those reported in similar studies.39–41 High attendance can be translated as high dose of exposure to the intervention, which may improve the chances of generating meaningful impact.39,42 The average percent of objectives met also varied across sessions, with an overall mean of 86% of objectives completed. The most commonly unmet objective was the creation of personal goals. This component of the program was scheduled at the end of each session, it is possible that participants (with busy schedules) were more focused on getting out the door then creating and writing down goals. Since health goal creation and documentation increases the likelihood of improving health behaviors, it is possible that further increases in scores for iCook program evaluation scales would have resulted if this objective had been achieved more consistently.

All leaders took longer than the planned time (120 minutes) for session one. Despite the inclusion of adequate technology (at least one internet-capable electronic device per dyad) as a requirement for program implementation sites, the leaders reported (via email communication with the coordinator) a lack of technology for program evaluation completion. Hence, participants had to take turns completing evaluations which resulted in some participants being kept longer than the planned time. Leaders tended to take less than the planned time for sessions two through six, however, some leaders took the full 120 minutes for those sessions. Short sessions may in part be indicative of efficiency on behalf of leaders and
participants but may also have been a product of skipped or rushed objectives. On average, leaders took the full 120 minutes for session seven, however, some did require additional time.

High engagement of participants was an indication that they were likely learning from program activities which improved the likelihood of positive change. It is worth noting that the only youth mean score below 3.3 was that of the first session, the program introduction, which consisted mainly of paperwork, evaluation, and technology training. This lower engagement of the youth was therefore expected. Based on these findings, instructional capacity of leaders was good. In assessing leader effectiveness, mean scores for sessions ranged from 3.3 to 4.0 on a 4.0 scale; leaders were seen as effective to highly effective in objective and focal area delivery and communication. Participant learning and participant potential for change are both positively correlated with high leader effectiveness. Overall interpretation of fidelity assessment results indicated that the actual iCook 4-H curriculum delivery followed intended delivery exceptionally well.

**Informal Leader Feedback and Program Troubleshooting**

Several technology aspects that some leaders struggled with were attributable to simple human error. For example, passwords were often forgotten; this may be ameliorated by including additional reminders in program start-up materials for leaders to document all username and password material both for participants and for themselves. Other issues, such as participants not always completing process evaluations on site following sessions, are indicative of a deeper problem. Despite having clearly discussed the need for wireless internet and multiple web-connected devices for dyads’ evaluation completion well in advance of session start, some sites did not have adequate technology for the duration of the program. The coordinator had to be involved to promote leader encouragement of participant evaluation completion at home. As a dissemination study the intent was to have minimal researcher-leader interaction. Since this was a pilot of dissemination, some researcher guidance was still acceptable, however, in future iterations of dissemination and implementation such extensive oversight will not necessarily be available. It must be made even more abundantly clear in trainings and training materials.
that evaluations must be completed prior to leaving the site. Without evaluations, leaders forego valuable feedback which could improve the efficacy of their future sessions and future implementations of the program.

**Suggestions Based on the Quality Implementation Framework**

While it would have been desirable to conduct a systematic program review following the Quality Implementation Framework, a retrospective review was a valuable exercise providing the iCook researchers with quality information. To fully understand the iCook 4-H program in the context of the Quality Implementation Framework it is necessary to first describe the human infrastructure of iCook 4-H in the context of the Interactive Frameworks System (IFS) which consists of three team systems: the synthesis and translation system, the delivery system, and the support system. The iCook 4-H researchers make up the synthesis and translation system; their goal is to translate theory and evidence into user-friendly evidence-based practice. Specifically, the principal investigators (PIs) are the core of this system. The PIs endeavored to create the curriculum, test its efficacy, and create the physical guides for its use. They also generated the initial strategy for dissemination and implementation of the program. The iCook 4-H delivery system, the Cooperative Extension staff leaders, are the stakeholders who took (and will continue to take) the work of the synthesis and translation system and put it to use in real-world settings. They are the front-line staff, the session leaders. Finally, the iCook 4-H support system consisted of the long-term researchers and senior-level Cooperative Extension staff who will act as ongoing champions for the program. These people provide training to new leaders, technical assistance when necessary, and monitoring of the delivery system and of results. They will be charged with the task of building and maintaining capacity for implementation.

**Phase 1 - Initial Considerations Regarding the Host Setting**

In Step I, “conducting a needs and resource assessment of the host setting,” implementation at a site where the program is not needed will result in low satisfaction with the program. An example of a site where iCook 4-H is not needed might be an area where a parent/child cooking class is already
established. Likewise, implementation at a site where resources are inadequate can result in participant dissatisfaction with the program. This happened in the case of the pilot dissemination, where sites did not have adequate technology available for timely evaluation completion. In either case, participant dissatisfaction will lead to negative reviews of the program within the community and will likely lead to poor participant retention and future recruitment. At the time of the pilot dissemination, the iCook 4-H program had no official means by which to assess the needs or resources of potential new sites. While the creation of such an assessment is a task for researchers, its administration will fall to senior level Extension staff as this type of assessing is inherent in their jobs.

In conducting a fit assessment (Step II), it must be determined how well the innovation or program matches the previously identified needs of the host. In relation to the iCook program, a fit assessment would cover the cultural preferences of those served at the host site, income level of local population, and other items which may affect recipe interest or applicability of cooking techniques. The program must be able to meet such preferences and requirements in order to maintain high participant involvement and retention and increase the likelihood of program recurrence. A site not well suited to the program could be denied based on predetermined standards or decisions could be made on a case-by-case basis in which case a protocol must be laid out for decision making. This protocol would need to include identification of the parties responsible for decision making. There is also the option to alter the curriculum to suit the needs of the site. Interestingly, in the pilot dissemination, the flexibility of the leaders (and the curriculum) to conform to the needs of the group was evident, as a leader led a group in her own kitchen rather than a larger cooking space which was envisioned by the research team. Leaders also found that culturally-focused recipes were not desired by Hispanic dyads in Nebraska.

In conducting a capacity/readiness assessment, the delivery system must explore the degree to which the host has both the resources and (equally important) the will and motivation to implement the program (Step III). Readiness for change must also be assessed. At the time of pilot dissemination, iCook 4-H researchers had no means by which to assess communities’ readiness for change. There was,
however, an informal mechanism for assessing leaders’ will and motivation for program implementation, since leaders were asked and could refuse to participate in the program. In the case of a program like iCook 4-H, community readiness to change may not be a meaningful assessment as the program only requires up to six dyads at a time to be ready to change. Dyads will be drawn to the program as they reach readiness. Will and motivation of leaders, however, could prove to be a useful assessment as these play a large part in determining the quality of leaders’ instruction. Leaders will likely be more captivating if they are participating in iCook 4-H out of interest rather than under on boss’ orders. Depending on the program, this assessment may also include a measure of staff proficiency of necessary skills. iCook 4-H may benefit from the development of such a measure. Since iCook 4-H trainings are mainly accessed online, this could be as simple as quizzes after trainings which are required prior to being granted access to the next step of training. Questions could cover items such as where to find certain information, how to reset website passwords, or who to contact in the case of particular difficulties. In regards to resource needs, iCook 4-H has a resource assessment in the form of a “site needs” list within the site recruitment pamphlet (Appendix H). This was created by the coordinator following pilot dissemination for use in the next phase of the iCook 4-H dissemination. However, this material capacity is self-assessed by site leaders who may not realize the importance of meeting each and every site need. Assessment by a higher level stakeholder may be necessary to ensure full compliance.

Making decisions about adapting the program and strategizing for capacity building (Step IV) are especially important going forward for the dissemination of the iCook program. If during Step II it is determined that sites are not well suited for the program and the needs of the site are determined, then in Step IV the goal is to determine whether the program/intervention should be modified/altered to better fit the host setting or site-specific participants. However, it is imperative that any and all alterations improve participant experience while maintaining fidelity to the program. If adaptations are made, it is important to document these alterations, the reasons for them, and to develop a plan to monitor their impact during implementation. Alterations may be made on a site-to-site basis, however, this type of alteration takes
time and consideration to maintain fidelity and will require testing for efficacy. Such adaptations must be created under the direction of both the researchers (synthesis and translation system) and the stakeholders in the particular location. It may be beneficial for researchers to first identify areas of potential modification and areas which are not to be modified due to their essentiality to the efficacy of the program. This allows for a more directed discussion. Potential modifications should be focused more on enhancing the fit of the program to the population and improving participant engagement and retention, not on key components of the intervention itself. Modifications should not take place after researchers have stepped away from the project, their expertise is necessary for the maintenance of fidelity and efficacy. Continual modification without researcher input may eventually result in a program which no longer follows the proven iCook 4-H model. It may be more beneficial to begin creating a dossier of pre-formed and tested iCook 4-H adaptations. As previously discussed by the research team, such adaptations may include altered recipe profiles for cultural appeal, altered recipes for use in low-income or inner city areas where true kitchen space (especially oven) access is limited, and more or less difficult kitchen skill lessons for different age groups. Such adaptations could easily cover the majority of potential situations and improve program fit with little effort beyond their initial creation. Once these pre-formed adaptations exist it will be simpler to assess which version of iCook 4-H best suits the individual site. If adaptations are made, the support system must ensure that evaluation tools reflect and incorporate these alterations. The support team must also assess the degree to which adaptations impact outcomes and the quality and fidelity of implementation. Such information should be reported back to the delivery team to allow for reflection and potential improvements in delivery.

In accomplishing Step V, obtaining explicit buy-in from critical stakeholders and fostering a supportive climate, it is important to gain a champion (or champions) for the program. Currently, Cooperative Extension/4-H staff within each state act as iCook champions. Since the pilot dissemination, a champion at the national level of 4-H has been initiated by the iCook researchers who met with the National 4-H Council about reviewing the curriculum and making it available for a cost on their website.
This will ensure a lasting presence in this group. The program might also gain further reach through the recruitment of champions from outside the Cooperative Extension community. The curriculum could be promoted to younger audiences through programs such as WIC or to areas physically outside Cooperative Extension’s reach through partnerships with after-school programs. Champion recruitment will likely benefit from direct communication from current iCook 4-H proponents and the provision of encouraging results and participant testimony. These results and testimony should be collected and presented in a simple but visually appealing format such as a color pamphlet or short video. At the time of this writing, a novel method for the collection of such information was being created by the iCook research team in West Virginia. The second part of this step (fostering a supportive climate) is accomplished when researchers and champions have effectively addressed concerns, questions, resistance, and barriers to the implementation. It may also involve the creation of strategies such as incentivizing staff to make use of the program. Barriers, questions, and concerns (and the responses to each) should be documented as they are uncovered. Documentation allows effective responses to be shared with future leaders who can then implement with reduced resistance. It will be necessary however to create a system for this documentation and sharing. This system could be as complex as a survey, the results of which an upper-level stakeholder would need to compile and distribute, or as simple as a web-based forum.

When considering Step VI, the building of general/organizational capacity, assessment of the infrastructure and skills/motivation of the host organization/community is conducted and suggestions for enhancements to positively affect the quality of implementation are made.29 iCook 4-H is well situated for wide-scale implementation within the existing multi-state infrastructure. The research teams’ partnership with Cooperative Extension, which is present in every county in our country, will allow for extensive reach and provides an innate infrastructure. While the infrastructure, skills, and motivations of Cooperative Extension and its staff are well aligned with those of the iCook 4-H program by design, expansion beyond this medium may require more effort on the part of the iCook 4-H team in terms of building the host organization’s capacity to implement. New hosts will need a hierarchical organization
similar to that used within Cooperative Extension, with both local level leaders and a senior level
champion oversee the dissemination and implementation of the program. Also, if process and fidelity
evaluations are to continue through dissemination, the iCook 4-H team must ensure that the organization
has staff designated to the collection and return of these data.

The recruitment and maintenance of staff in Step VII is critical to program dissemination and
within Cooperative Extension, recruitment was a straight-forward process for the iCook researchers. The
program was spread by word of mouth and by direction of senior staff. In Maine, Nebraska, and South
Dakota the program has been written into the plan of work for Extension Educators. The curriculum,
materials, and training modules are all easily accessible by Cooperative Extension staff on the existing
Extension.org Moodle. If however, the program is to move outside of Extension.org, recruitment may
become more involved and techniques for recruitment will depend on the new hosts’ existing
organization. While newly recruited front-line staff members need little prior understanding of the
program at recruitment, they will need some work in the form of training and support to adequately
implement the program.

To accomplish the final step in phase one, Step VIII, providing effective pre-innovation staff
training, second tier staff must provide adequate training to the front-line staff. Staff members with prior
knowledge of the program and the necessity of fidelity for maintenance of efficacy should be procured to
act as trainers and support for leaders. The inception of this second tier of iCook 4-H staff has begun.
Within each state, the train the trainer model has been employed for continued training of future staffing
needs. As the program expands more second tier staff will become necessary. Training must ensure an
understanding not only of the basic procedures of implementation but also of the theory behind, and
values of the program. It must also cover the skill-based competencies necessary for the practitioners to
deliver the program accurately, effectively, and confidently. iCook 4-H’s current leader training has been
deemed adequate (through the pilot dissemination study) for Extension staff, however, leaders from new
host programs may require more background training than Extension staff whose values already align with those of iCook 4-H.

**Phase 2- Creating a Structure for Implementation**

The support system is solidified in Step IX when implementation teams are created. As a result of the pilot dissemination, the amount of support provided by the iCook team became critically evident. The coordinator acted in the help center role providing technical support and troubleshooting. The success of accomplishing a three-pronged approach to program evaluation can be ascribed in part to the coordinator’s role in frequent communication with leaders to gather process evaluation data and facilitate the fidelity evaluation process by ensuring the presence of fidelity evaluators. The roles and responsibilities of implementation team members must be clearly delineated in such a way that researcher involvement becomes unnecessary. For future dissemination, if a software program (such as Qualtrics) is used to collect the program and process evaluation measures, second tier staff will need to be trained for that purpose and will need to assume the role of technical support. Such training could be carried out by existing second tier staff or by a separate level of staff whose sole responsibility is training. There will also need to be staff members designated to the maintenance of the website and the overall database.

Previous discussion among the iCook 4-H researchers suggested the need for a central office with permanent full-time staff dedicated to such background activities. However, while this approach is ideal, it would require extensive ongoing funding which cannot currently be relied upon. If the iCook researchers secure funding for a second 5-year grant to continue iCook 4-H research that would provide the opportunity to strengthen and expand the infrastructure that is currently being developed. Continued oversight by the iCook team, along with the national distribution of the curriculum through the National 4-H Council would greatly facilitate program dissemination.

In step X a clear and direct plan of action must be laid out to ensure specific tasks are completed within the confines of an implementation timeline. For an extensive and continuous dissemination such as iCook 4-H, this may be a two-fold plan. There will need to be a timeline for new sites to prepare them for
their initial program implementation. This timeline would cover pre-program steps including that which was previously discussed and a separate plan for coordinating implementation efforts across sites. This plan would include timelines or direction for the collection and analysis of evaluation data at state, regional, and/or national levels and the ongoing development of hierarchy as the program expands.

**Phase 3- Ongoing Structure Once Implementation Begins**

In addressing Step XI, the necessary technical assistance/coaching/supervision as implementation progresses, support staff must be available to provide adequate assistance to deal with operational problems as they arise. As previously mentioned, these tasks may fall under the domain of second tier staff or may be relegated to dedicated support staff. The means by which this communication takes place and is documented should be standardized across sites to allow for sharing of information. The use of a question and answer forum style may be beneficial as it could alleviate the technical assistance burden on individuals.

During process evaluation in Step XII, the plan and tools to evaluate strengths and shortcomings in the implementation and how they evolve over time is addressed. Data collected in this step will describe the performance of staff in conducting aspects of implementation. While the process evaluation exists in the three-pronged approach for the curriculum, these procedures could be reviewed and modified to create a broader scope process evaluation.

The feedback loop identified in Step XIII will be a key aspect of successful dissemination. When researchers, senior staff and/or champions develop a communication system by which findings from evaluations that are relevant to front-line staff, support staff, and stakeholders can be efficiently distributed, discussed, and acted upon, the result will be skill development, organizational growth, and quality improvement of the program over time. As previously discussed, a system must be set in place for the analysis and distribution of evaluation data to the appropriate parties in the absence of researcher direction. It may be possible to find a program that will automatically generate site-based process evaluation reports and return them to leaders. However, a regional or program-wide analysis will be more
difficult to manage. A plan should be set forth identifying which stakeholders should receive analysis at what times. For example, program outcome evaluation will be desirable data for Cooperative Extension staff reports, weekly process evaluation results will be important for leaders, and fidelity evaluation feedback will provide the data to acknowledge noteworthy leaders and identify where retraining is needed.

**Phase 4- Improving Future Applications**

To accomplish phase four, Step XIV- (the final aspect of the quality implementation framework) the improvement of future applications, there must be constant learning from experience. This step requires the collaboration of all involved parties to reflect on the implementation. The constructive feedback from the perspectives and experiences of every level of organization is necessary to improve future iterations of implementation. Topics of discussion may include such things as the use, modification, or application of the innovation and factors that may have affected the quality of its implementation. An iCook 4-H symposium or conference may be the most productive way to complete this step. This type of event allows all levels of organization to meet together and share ideas and experiences in a meaningful and memorable way and to establish and build a sense of community between hierarchical levels. This may also be a time to showcase and celebrate program results. Presentations made at this event could also be submitted to outside conferences as a way to continue to spread the word about iCook and potentially continue site recruitment.
CHAPTER 6

CONCLUSIONS

While much effort has gone into the creation of obesity prevention programs like iCook 4-H, such programs remain largely under-utilized. The disconnect between research and practice highlights the necessity of dissemination and implementation strategies to ensure programs become adopted into practice. Creating a well-informed systematic approach to implementation will ensure that the iCook 4-H program will be implemented efficaciously and sustainably to improve the health of generations to come. The goal of this research was to inform the future dissemination and implementation of the iCook 4-H program.

Careful attention to detail was paid in developing the iCook 4-H three-pronged approach of program, process, and fidelity evaluation to be consistent and reliable over time. This system of evaluation illuminates the successes and failures in program delivery, allowing for dynamic improvements in delivery method. It also measures change, providing an evidence-base to define the program impact. Finally, it determines if actual program delivery aligns with intended program delivery. These means of evaluation provide evidence for improvements in training and materials for future iterations of the program.

Based on results from the three-pronged evaluations, the iCook 4-H pilot dissemination was deemed a successful first step in transitioning the program to community settings. Both youth and adult participants identified the key components (concrete as well as abstract) of the program, demonstrated significantly increased scores in overall outcome measures (and the majority of youth subscales), maintained high attendance, and were highly engaged in sessions. Through third-party fidelity assessment, leaders were categorized as effective to highly effective and were able to cover session materials and meet objectives within or below the intended session duration. Based on this assessment, the resources provided to leaders were deemed sufficient. However, while novel and well designed, this approach to evaluation was not intended to serve as a complete dissemination and implementation (D&I)
plan. Significant exploration into dissemination and implementation strategies and frameworks was not completed prior to the pilot dissemination study. In fact, the pilot dissemination itself was added to the study timeline late in the study process to allow for a “learn by doing” technique for D&I improvement.

Through the process of piloting iCook 4-H dissemination, researching dissemination and implementation science, and evaluating the iCook program through the lens of the Quality Implementation Framework a myriad of potential strategies for improvement of iCook 4-H D&I were discovered. Suggested avenues for improvement of future dissemination and implementation include:

- Creation of a resource/needs/fit assessment
- Creation of a capacity/readiness assessment
- Generation of multiple iCook curriculum adaptations
- Creation of materials for marketing the program to potential champions
- Generation of a system for documenting and sharing effective responses to implementation barriers
- Development of more extensive training for non-Extension staff leaders and new second-tier staff
- Determination of the ultimate hierarchy of staff members and roles of each level
- Development of a timeline of steps for new site pre-program preparation
- Development of a timeline of steps for across-site implementation coordination
- Establishment of mechanisms for timely supportive feedback
- Provision of opportunities for the sharing of experiences and community building between structure levels
- Provision of opportunities for the celebration of program success.

Ultimately, it is up to the iCook 4-H principal investigation team to determine which strategies should be incorporated into future dissemination and implementation efforts to ensure iCook 4-H
continues to be implemented and generates a lasting impact on communities as an evidence-based practice.
REFERENCES


18. Lieb D, Snow R, BeBoer M. Socioeconomic Factors in the Development of Childhood Obesity


34. Mathews DR. Development of a 3-Pronged Approach to Evaluation for the iCook 4-H Project. 2015.

35. Department of Veterans Health Administration, Health Services Research & Development QERI. *Implementation Guide. Updated 2013.*


## APPENDICES

### Appendix A: iCook 4-H Session Composition

<table>
<thead>
<tr>
<th>Lesson</th>
<th>Food Focus - Culinary Skills - Recipe</th>
<th>Physical Activity</th>
<th>Family Meals &amp; Communication - Goal Setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Healthy snacks - Fruit and yogurt parfaits</td>
<td>Introduction to iCook</td>
<td>Pre-program evaluations, technology training (website navigation, video uploading)</td>
</tr>
<tr>
<td>2</td>
<td>MyPlate - Knife skills, preparing produce - Fruit salsa w/ cinnamon chips</td>
<td>Circle game, intro activity</td>
<td>Components of successful family meals - setting SMART-R goals</td>
</tr>
<tr>
<td>3</td>
<td>Dairy - Food safety, blender use - Fruit and vegetable smoothies</td>
<td>Understanding heart rate, using heart &amp; lungs when active</td>
<td>Child parent mealtime dynamics, taste testing - Short- &amp; long- term goals</td>
</tr>
<tr>
<td>4</td>
<td>Vegetables - Knife skills, peeling, oven / stovetop, seasoning, meal planning - Oven roasted vegetables</td>
<td>Charades, resistance training</td>
<td>Place settings - Goal setting review and activity</td>
</tr>
<tr>
<td>5</td>
<td>Fruits - Grocery shopping, food labels, handling canned foods - Baked Apples</td>
<td>Stretching and flexibility</td>
<td>Quality communication - Goal setting review and activity</td>
</tr>
<tr>
<td>6</td>
<td>Grains - Makeover leftovers, proper reheating, stir-frying - Rice stir fry</td>
<td>iCook Shuffle, healthy downtime, sitting less &amp; moving more</td>
<td>Increasing family meal frequency and meal planning - Goal setting review and activity</td>
</tr>
<tr>
<td>7</td>
<td>Protein - Using seasonings, skillet skills, shredding - Lentil &amp; Cheese Quesadilla</td>
<td>Cup stacking relay race, active group / family games</td>
<td>Avoiding power plays at dinner - Goal setting review and activity</td>
</tr>
<tr>
<td>8</td>
<td>Making healthy recipes using MyPlate - MyPlate sushi</td>
<td>Active play</td>
<td>Post-program evaluations, reflection and discussion of lessons learned and how to move forward</td>
</tr>
</tbody>
</table>

---

54
Appendix B: Youth Program Outcome Evaluation Questions

Youth Questionnaire: iCook 4-H Youth Pilot Dissemination Pre-Test

Q118 Hello! Thank you for participating in the iCook project. Please take your time and answer these questions. There is no right or wrong answer.

Q95 Answer the following questions by thinking about if you KNOW HOW TO do what is asked. If you can do what is asked, then you agree with the statement. If you can NOT do what is asked, then you never can do the statement.

Q64 Can you use a knife to cut foods with help from someone else?
   ○ Never (1)
   ○ Rarely (2)
   ○ Sometimes (3)
   ○ Often (4)
   ○ All of the Time (5)

Q65 Can you use a knife to cut foods by yourself?
   ○ Never (1)
   ○ Rarely (2)
   ○ Sometimes (3)
   ○ Often (4)
   ○ All of the Time (5)

Q66 Can you use an oven for cooking with help from someone else?
   ○ Never (1)
   ○ Rarely (2)
   ○ Sometimes (3)
   ○ Often (4)
   ○ All of the Time (5)
Q67 Can you use an oven for cooking by yourself?
- Never (1)
- Rarely (2)
- Sometimes (3)
- Often (4)
- All of the Time (5)

Q68 Can you use a stovetop for cooking with help from someone else?
- Never (1)
- Rarely (2)
- Sometimes (3)
- Often (4)
- All of the Time (5)

Q69 Can you use a stovetop for cooking by yourself?
- Never (1)
- Rarely (2)
- Sometimes (3)
- Often (4)
- All of the Time (5)

Q70 Can you use a blender with help from someone else?
- Never (1)
- Rarely (2)
- Sometimes (3)
- Often (4)
- All of the Time (5)

Q71 Can you use a blender with help by yourself?
- Never (1)
- Rarely (2)
- Sometimes (3)
- Often (4)
- All of the Time (5)
Q72 Can you cook foods to the right temperature with help from someone else?
- Never (1)
- Rarely (2)
- Sometimes (3)
- Often (4)
- All of the Time (5)

Q73 Can you cook foods to the right temperature by yourself?
- Never (1)
- Rarely (2)
- Sometimes (3)
- Often (4)
- All of the Time (5)

Q74 Can you store foods the right way with help from someone else?
- Never (1)
- Rarely (2)
- Sometimes (3)
- Often (4)
- All of the Time (5)

Q75 Can you store foods the right way by yourself?
- Never (1)
- Rarely (2)
- Sometimes (3)
- Often (4)
- All of the Time (5)

Q76 Can you measure ingredients for a recipe with help from someone else?
- Never (1)
- Rarely (2)
- Sometimes (3)
- Often (4)
- All of the Time (5)
Q77 Can you measure ingredients for a recipe by yourself?
- Never (1)
- Rarely (2)
- Sometimes (3)
- Often (4)
- All of the Time (5)

Q78 Can you plan a meal using all the food groups (MyPlate) with help from someone else?
- Never (1)
- Rarely (2)
- Sometimes (3)
- Often (4)
- All of the Time (5)

Q79 Can you plan a meal using all the food groups (MyPlate) by yourself?
- Never (1)
- Rarely (2)
- Sometimes (3)
- Often (4)
- All of the Time (5)

Q80 Can you use herbs and spices when cooking with help from someone else?
- Never (1)
- Rarely (2)
- Sometimes (3)
- Often (4)
- All of the Time (5)

Q81 Can you use herbs and spices when cooking by yourself?
- Never (1)
- Rarely (2)
- Sometimes (3)
- Often (4)
- All of the Time (5)
Q87 When you think about each day of the week, how often are you physically active for at least 60 minutes each day?

- Never (1)
- Rarely (2)
- Sometimes (3)
- Often (4)
- All of the Time (5)

Q97 Answer the following questions by thinking about how willing you are to do what is asked.

Q92 How willing are you to taste new foods you have not tried?

- Very unwilling (1)
- Somewhat unwilling (2)
- Neither unwilling nor willing (3)
- Somewhat willing (4)
- Very Willing (5)

Q93 How willing are you to cook new foods that you have not tried?

- Very unwilling (1)
- Somewhat unwilling (2)
- Neither unwilling nor willing (3)
- Somewhat willing (4)
- Very Willing (5)

Q94 How willing are you to try foods in new and interesting ways?

- Very unwilling (1)
- Somewhat unwilling (2)
- Neither unwilling nor willing (3)
- Somewhat willing (4)
- Very Willing (5)

Q96 Answer the following questions by thinking about the DOUBT you have that you can do what is asked. If you have no doubt you can do what is asked, then you agree with the statement. If you doubt you can do what is asked, then you disagree with the statement.
Q58 I am sure I can cook.
- Strongly Agree (1)
- Agree (2)
- Neither Agree nor Disagree (3)
- Disagree (4)
- Strongly Disagree (5)

Q59 I am sure I can follow a recipe.
- Strongly Agree (1)
- Agree (2)
- Neither Agree nor Disagree (3)
- Disagree (4)
- Strongly Disagree (5)

Q60 I am sure I can use a knife safely.
- Strongly Agree (1)
- Agree (2)
- Neither Agree nor Disagree (3)
- Disagree (4)
- Strongly Disagree (5)

Q61 I am sure I can use an oven.
- Strongly Agree (1)
- Agree (2)
- Neither Agree nor Disagree (3)
- Disagree (4)
- Strongly Disagree (5)

Q62 I am sure I can use a stovetop.
- Strongly Agree (1)
- Agree (2)
- Neither Agree nor Disagree (3)
- Disagree (4)
- Strongly Disagree (5)
Q63 I am sure I can make food safely to avoid getting sick.
- Strongly Agree (1)
- Agree (2)
- Neither Agree nor Disagree (3)
- Disagree (4)
- Strongly Disagree (5)

Q98 Answer the following questions, by thinking about how OFTEN you do what’s asked.

Q82 How often is it stressful to eat together as a family?
- Never (1)
- Rarely (2)
- Sometimes (3)
- Often (4)
- All of the Time (5)

Q83 How often do you help your parents shop for groceries?
- Never (1)
- Rarely (2)
- Sometimes (3)
- Often (4)
- All of the Time (5)

Q84 How often does your family eat together?
- Never (1)
- Rarely (2)
- Sometimes (3)
- Often (4)
- All of the Time (5)

Q85 How often do you help cook meals for your family?
- Never (1)
- Rarely (2)
- Sometimes (3)
- Often (4)
- All of the Time (5)
Q86 How often do you eat with your family at a table without distractions? (TV, cell phones)

- Never (1)
- Rarely (2)
- Sometimes (3)
- Often (4)
- All of the Time (5)

Q88 When you think about each day of the week, how often does your heart pump hard and you sweat when you are being physically active?

- Never (1)
- Rarely (2)
- Sometimes (3)
- Often (4)
- All of the Time (5)

Q89 How often does your family play actively together?

- Never (1)
- Rarely (2)
- Sometimes (3)
- Often (4)
- All of the Time (5)

Q90 How often do you set healthy goals for yourself?

- Never (1)
- Rarely (2)
- Sometimes (3)
- Often (4)
- All of the Time (5)

Q91 How often do you meet your healthy goals?

- Never (1)
- Rarely (2)
- Sometimes (3)
- Often (4)
- All of the Time (5)
Q100 I can access the Internet by myself.
- Never (1)
- Rarely (2)
- Sometimes (3)
- Often (4)
- All of the Time (5)

Q101 I can access the Internet with help from someone else.
- Never (1)
- Rarely (2)
- Sometimes (3)
- Often (4)
- All of the Time (5)

Q102 I can take digital pictures by myself.
- Never (1)
- Rarely (2)
- Sometimes (3)
- Often (4)
- All of the Time (5)

Q103 I can take digital pictures with help from someone else.
- Never (1)
- Rarely (2)
- Sometimes (3)
- Often (4)
- All of the Time (5)

Q104 I can download digital pictures to the computer by myself.
- Never (1)
- Rarely (2)
- Sometimes (3)
- Often (4)
- All of the Time (5)
Q105 I can download digital pictures to the computer with help from someone else.
- Never (1)
- Rarely (2)
- Sometimes (3)
- Often (4)
- All of the Time (5)

Q108 I can take digital videos by myself.
- Never (1)
- Rarely (2)
- Sometimes (3)
- Often (4)
- All of the Time (5)

Q109 I can take digital videos with help from someone else.
- Never (1)
- Rarely (2)
- Sometimes (3)
- Often (4)
- All of the Time (5)

Q110 I can download digital videos to the computer by myself.
- Never (1)
- Rarely (2)
- Sometimes (3)
- Often (4)
- All of the Time (5)

Q111 I can download digital videos to the computer with help from someone else.
- Never (1)
- Rarely (2)
- Sometimes (3)
- Often (4)
- All of the Time (5)
Q112 I can upload a video to YouTube by myself.
- Never (1)
- Rarely (2)
- Sometimes (3)
- Often (4)
- All of the Time (5)

Q113 I can upload a video to YouTube with help from someone else.
- Never (1)
- Rarely (2)
- Sometimes (3)
- Often (4)
- All of the Time (5)

Q119 I can link videos to the iCook 4-H website with help from someone else.
- Always (1)
- Most of the Time (2)
- Sometimes (3)
- Rarely (4)
- Never (5)

Q120 I can link videos to the iCook 4-H website by myself.
- Always (1)
- Most of the Time (2)
- Sometimes (3)
- Rarely (4)
- Never (5)

Q114 How do you get on the Internet?
- Personal computer (laptop or desktop) (1)
- Personal mobile device (2)
- School computer (laptop or desktop) (3)
- School mobile device (4)
- Gaming console (7)
Q115 Where do you usually access the Internet.
- Home (1)
- Friend or Family member's house (2)
- School (3)
- Public place (like a library) (4)

Q54 What is your name? ___________________________

Q56 What is your iCook 4-H User ID (ask an iCook person) ________________

Q55 What state do you live in?
- Maine (1)
- South Dakota (2)
- Nebraska (3)
- West Virginia (4)
- Tennessee (5)

Q6 When is your birthday?
- 2003 (1)
- 2004 (2)
- 2005 (3)
- 2006 (4)
- Choose Not to Answer (6)

Q7 What grade are you in this year in school?
- 3rd Grade (1)
- 4th Grade (2)
- 5th Grade (3)
- 6th Grade (5)
- 7th Grade (6)
- Choose Not to Answer (4)

Q8 Are you a boy or a girl?
- Boy (1)
- Girl (2)
- Choose Not to Answer (3)
Appendix C: Adult Program Outcome Evaluation Questions

Adult Questionnaire - iCook Intervention Parent Pilot Dissemination

Thank you for participating in the iCook program. Please answer the following questions. There are no right or wrong answers. At any time if you do not wish to answer a question you may skip it, or select choose not to answer.

Q1 This is a survey about ways you plan and fix foods for your family. For these questions, think about the recent past. There are no wrong answers.

<table>
<thead>
<tr>
<th>Question</th>
<th>Do Not Do (1)</th>
<th>Seldom (2)</th>
<th>Sometimes (3)</th>
<th>Most of the Time (4)</th>
<th>Almost Always (5)</th>
<th>Choose Not to Answer (6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>How often do you plan meals ahead of time? (1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How often do you compare prices before you buy food? (2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How often do you run out of food before the end of the month? (3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How often do you shop with a grocery list? (4)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>This question is about meat and dairy foods. How often do you let these foods sit out for more than two hours? (5)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How often do you thaw frozen food at room temperature? (6)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>When deciding what to feed your family, how often do you think about healthy food choices? (7)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How often have you prepared foods without adding salt? (8)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How often do you use the &quot;Nutrition Facts&quot; on the food label to make food choices? (9)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How often do your children eat something in the morning within two hours of waking up? (10)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Are you active on 4 or more days a week? (11)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
survey about ways you plan and fix foods for your family. For these questions, think about the recent past. There are no wrong answers.

Q7 Do you or any members of your family participate in any of the following? Aid to dependent children/TANF EFNEP Free/Reduced price school meals Medicaid, welfare-to-work, WIC SNAP Supplemental security income

- Yes (1)
- No (2)
- Choose Not to Answer (3)

Q132 How often do you shop with a grocery list?

- Never (1)
- Rarely (2)
- Sometimes (3)
- Most of the time (4)
- Always (5)

Q133 When you think about each day of the week, how often is your child physically active for at least 60 minutes each day?

- Never (1)
- Rarely (2)
- Sometimes (3)
- Most of the time (4)
- Always (5)

Q131 How often do you plan your weekly meals?

- Never (1)
- Rarely (2)
- Sometimes (3)
- Most of the time (4)
- Always (5)

Q124 How often does your child help you cook meals?

- Never (1)
- Rarely (2)
- Sometimes (3)
- Most of the time (4)
- Always (5)
Q138 When you think about each day of the week, how often are you physically active for at least 30 minutes each day?
- Never (1)
- Rarely (2)
- Sometimes (3)
- Most of the time (4)
- Always (5)

Q126 How often does your family eat together each week?
- Never (1)
- Rarely (2)
- Sometimes (3)
- Most of the time (4)
- Always (5)

Q135 How often do you enjoy making meals with your child?
- Never (1)
- Rarely (2)
- Sometimes (3)
- Most of the time (4)
- Always (5)

Q125 How often does your child help in meal planning?
- Never (1)
- Rarely (2)
- Sometimes (3)
- Most of the time (4)
- Always (5)

Q134 How often do you enjoy making meals?
- Never (1)
- Rarely (2)
- Sometimes (3)
- Most of the time (4)
- Always (5)
Q130 How often do you need to manage your grocery budget carefully to ensure balanced meals for your family toward the end of the pay period?
- Never (1)
- Rarely (2)
- Sometimes (3)
- Most of the time (4)
- Always (5)

Q127 How often do you make eating together as a family a priority?
- Never (1)
- Rarely (2)
- Sometimes (3)
- Most of the time (4)
- Always (5)

Q128 How often do the topics of conversations at mealtimes include all family members?
- Never (1)
- Rarely (2)
- Sometimes (3)
- Most of the time (4)
- Always (5)

Q139 How often does your child help you shop for groceries?
- Never (1)
- Rarely (2)
- Sometimes (3)
- Most of the time (4)
- Always (5)

Q137 How often would you rather eat out than make the evening meal?
- Never (1)
- Rarely (2)
- Sometimes (3)
- Most of the time (4)
- Always (5)
Q129 How often is it stressful to eat together as a family?
- Never (1)
- Rarely (2)
- Sometimes (3)
- Most of the time (4)
- Always (5)

Q123 How often does your family actively play together?
- Never (1)
- Rarely (2)
- Sometimes (3)
- Most of the time (4)
- Always (5)

Q136 How often do you feel confident with your kitchen skills?
- Never (1)
- Rarely (2)
- Sometimes (3)
- Most of the time (4)
- Always (5)

Q123 I am comfortable accessing the Internet.
- Always (1)
- Most of the time (2)
- Sometimes (3)
- Rarely (4)
- Never (5)

Q124 I am comfortable taking digital pictures.
- Always (1)
- Most of the time (2)
- Sometimes (3)
- Rarely (4)
- Never (5)
Q125 I am comfortable downloading digital pictures to the computer.
- Always (1)
- Most of the Time (2)
- Sometimes (3)
- Rarely (4)
- Never (5)

Q126 I am comfortable putting pictures on the iCook 4-H website.
- Always (1)
- Most of the Time (2)
- Sometimes (3)
- Rarely (4)
- Never (5)

Q127 I am comfortable taking digital videos.
- Always (1)
- Most of the Time (2)
- Sometimes (3)
- Rarely (4)
- Never (5)

Q128 I am comfortable downloading digital videos to the computer.
- Always (1)
- Most of the Time (2)
- Sometimes (3)
- Rarely (4)
- Never (5)

Q129 I am comfortable uploading videos to YouTube.
- Always (1)
- Most of the Time (3)
- Sometimes (4)
- Rarely (5)
- Never (6)
Q137 I am comfortable linking videos to the iCook 4-H website.
- Always (1)
- Most of the Time (2)
- Sometimes (3)
- Rarely (4)
- Never (5)

Q131 What is your primary method of accessing the Internet?
- Personal computer (laptop or desktop) (1)
- Personal mobile device (2)
- Work/school computer (3)
- Work mobile device (4)
- Gaming console (5)

Q132 Where do you use the Internet the most?
- Home (1)
- Friend or Family member's home (2)
- Work or school (3)
- Public Library (4)
- Other public location (5)

Q140 What state do you live in?
- Maine (1)
- South Dakota (2)
- Tennessee (3)
- West Virginia (4)
- Nebraska (5)

Q141 What is your name? ____________________________________________

Q143 What is your iCook 4-H User ID? (ask an iCook researcher for this information)
__________________________________________

Q2 What is your age in years? ____________________
Q107 What is your child's month of birth?
- January (1)
- February (2)
- March (3)
- April (9)
- May (10)
- June (11)
- July (12)
- August (13)
- September (14)
- October (15)
- November (16)
- December (17)

Q108 What is your child's date of birth?
- 1 (1)
- 2 (2)
- 3 (3)
- 4 (4)
- 5 (5)
- 6 (6)
- 7 (7)
- 8 (8)
- 9 (9)
- 10 (10)
- 11 (11)
- 12 (12)
- 13 (13)
- 14 (14)
- 15 (15)
- 16 (16)
- 17 (17)
- 18 (18)
- 19 (19)
- 20 (20)
- 21 (21)
- 22 (22)
- 23 (23)
- 24 (24)
- 25 (25)
- 26 (26)
Q109 What is your child's year of birth?
- 2002 (1)
- 2003 (2)
- 2004 (3)
- 2005 (4)
- 2006 (5)
- 2007 (6)

Q117 Are you the parent/grandparent of the child in the study?
- Parent (1)
- Grandparent (2)
- Other (3) ____________________
- Choose not to answer (4)

Q118 Are you the biological parent/grandparent of the child in the study?
- Yes (1)
- No (2)
- Choose not to answer (3)

Q122 From your child's point of view, how many other people live in your household (at least most of the year)?
- Grandparents (1)
- Parents (2)
- Aunts and/or Uncles (3)
- Siblings (4)
- Other Children (not siblings) (5)
- Adult Cousins (6)
- Other (non-related) (7)

Q3 How many children do you have? ______________________
Q4 What is your current marital status?
- Married (1)
- Widowed (2)
- Divorced (3)
- Single (4)
- In a committed relationship (5)
- Choose Not to Answer (6)

Q5 What is the highest education level you have completed?
- Elementary School (1)
- Some High school (2)
- High School (3)
- Some College (4)
- Associates Degree (5)
- Bachelor’s Degree (6)
- Graduate Degree (7)
- Doctoral Degree (8)
- Choose Not to Answer (9)

Q121 What is your employment status?
- Employed for wages (1)
- Self-Employed (2)
- Out of work and looking for work (3)
- Out of work but not currently looking for work (4)
- Stay at-home mom/dad (5)
- A student (6)
- Retired (7)
- Unable to work (8)
- Choose Not to Answer (9)

Q119 Does your child have any health conditions that may impact his/her height and/or weight?
- Yes (1)
- No (2)
If No Is Selected, Then Skip to How tall are you? Feet Inches

Q120 What is the condition?
### Q8 How tall are you?  Feet  Inches

<table>
<thead>
<tr>
<th>Feet (1)</th>
<th>0 0</th>
<th>0 1</th>
<th>0 2</th>
<th>0 3</th>
<th>0 4</th>
<th>0 5</th>
<th>0 6</th>
<th>0 7</th>
<th>0 8</th>
<th>0 9</th>
<th>0 10</th>
<th>0 11</th>
<th>0 12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inches (2)</td>
<td>0 (1)</td>
<td>1 (1)</td>
<td>2 (1)</td>
<td>3 (1)</td>
<td>4 (1)</td>
<td>5 (1)</td>
<td>6 (1)</td>
<td>7 (1)</td>
<td>8 (1)</td>
<td>9 (1)</td>
<td>10 (1)</td>
<td>11 (1)</td>
<td>12 (1)</td>
</tr>
</tbody>
</table>

### Q9 How much do you weigh (in pounds)? _________________

### Q10 Including yourself, how many total people live in your house? How many are adults? How many are children under age of 18?

- ______ Adults (1)
- ______ Children (2)

### Q136 I am comfortable linking videos to the iCook 4-H website.

- ♦ Always (1)
- ♦ Most of the Time (2)
- ♦ Sometimes (3)
- ♦ Rarely (4)
- ♦ Never (5)
Appendix D: Process Evaluation Questions for Child

1. **Lesson 1** – None.

2. **Lesson 2**
   a. How often did your family eat together during the last two weeks?
      i. categorized
   b. How often were you physically active for more than 60 minutes each day during the last two weeks?
      i. categorized
   c. How much of your plate should be fruits and vegetables at each meal?
      i. Multiple choice (None, a quarter, half, three quarters, all of it)
   d. To handle fruits and vegetables safely which of the following statements is true.
      i. Store them in a dark cool place until ready to eat them.
      ii. Wash them thoroughly before eating
      iii. Never eat the skin of fruits or vegetables
   e. How feel safe using a knife?
      i. Likert (None – A lot)

3. **Lesson 3**
   a. How often did your family eat together during the last two weeks?
      i. categorized
   b. How often were you physically active for more than 60 minutes during the last two weeks?
      i. categorized
   c. Did you make a video and post it on the website since the last class?
      i. Yes, No
   d. What are some good sources of whole grains?
      i. Multiple Choice- Check all that apply

4. **Lesson 4**
   a. How often did your family eat together during the last two weeks?
      i. categorized
   b. How often were you physically active for more than 60 minutes during the last two weeks?
      i. categorized
   c. Did you make a video and post it on the website since the last class?
      i. Yes, No
   d. How much will you be able to help your parents make a grocery list?

5. **Lesson 5**
   a. How often did your family eat together during the last two weeks?
      i. categorized
   b. How often were you physically active for more than 60 minutes during the last two weeks?
      i. categorized
   c. Did you make a video and post it on the website since the last class?
      i. Yes, No
   d. How likely are you to think about different colors, textures, and flavors when talking to your parents about meals?

6. **Lesson 6**
   a. How often did your family eat together during the last two weeks?
      i. categorized
   b. How often were you physically active for more than 60 minutes during the last two weeks?
c. Did you make a video and post it on the website since the last class?
   i. Yes, No

d. How likely are you to ask your parents to use herbs and spices when planning meals?
e. How likely are family meal talks to be important to everyone in your family?

7. Lesson 7
   a. How often did your family eat together during the last two weeks?
      i. categorized
   b. How often were you physically active for more than 60 minutes during the last two weeks?
      i. categorized
   c. Did you make a video and post it on the website since the last class?
      i. Yes, No
   d. How likely are you to add more dairy products (like milk and cheese) to what you eat?
e. How likely are you ask your parents to set the table for family meals?

8. Lesson 8 - None.
Appendix E: Process Evaluation Questions for Adult

1. **Lesson 1** - None.

2. **Lesson 2**
   a. How often did your family eat together during the last two weeks?
      i. categorized
   b. How often were you physically active for more than 60 minutes during the last two weeks?
      i. categorized
   c. After this class, how comfortable are you that your child is able to safely handle a knife with supervision?
      i. Drop down (not at all to very)
   d. How likely are you to prepare the recipe from class at home?
      i. Drop down (not at all to very)
   e. What other thoughts do you have about the class?
      i. Open ended

3. **Lesson 3**
   a. How often did your family eat together during the last two weeks?
      i. categorized
   b. How often were you physically active for more than 60 minutes during the last two weeks?
      i. categorized
   c. How likely are you to prepare the recipe from class at home?
      i. Drop down (not at all to very)
   d. What other thoughts do you have about the class?
      i. Open ended

4. **Lesson 4**
   a. How often did your family eat together during the last two weeks?
      i. categorized
   b. How often were you physically active for more than 60 minutes during the last two weeks?
      i. categorized
   c. How likely are you to prepare the recipe from class at home?
      i. Drop down (not at all to very)
   d. How likely are you to change the fat used in a recipe?
   e. What other thoughts do you have about the class?
      i. Open ended

5. **Lesson 5**
   a. How often did your family eat together during the last two weeks?
      i. categorized
   b. How often were you physically active for more than 60 minutes during the last two weeks?
      i. categorized
   c. How likely are you to prepare the recipe from class at home?
      i. Drop down (not at all to very)
   d. How likely are you to choose a lower percentage fat milk?
   e. How likely are you to think about different colors, textures, and flavors when talking to your parents about meals?
   f. What other thoughts do you have about the class?
      i. Open ended

6. **Lesson 6**
   a. How often did your family eat together during the last two weeks?
i. categorized  
b. How often were you physically active for more than 60 minutes during the last two weeks?  
   i. categorized  
c. How likely are you to prepare the recipe from class at home?  
   i. Drop down (not at all to very)  
d. How likely are you to ask try and incorporate herbs and spices in your meals?  
e. How likely are family meal talks to be important to everyone in your family?  
f. What other thoughts do you have about the class?  
   i. Open ended  

7. **Lesson 7**  
a. How often did your family eat together during the last two weeks?  
   i. categorized  
b. How often were you physically active for more than 60 minutes during the last two weeks?  
   i. categorized  
c. How likely are you to prepare the recipe from class at home?  
   i. Drop down (not at all to very)  
d. How likely are you to increase the number of times per week you have family meals?  
e. When having family meals, how likely are you to set a table?  
f. What other thoughts do you have about the class?  
   i. Open ended  

8. **Lesson 8** – None.
Appendix F: Process Evaluation Questions for Leader

Lessons 1 – 8

1. How many people participated in the class?
2. Were the materials provided adequate to complete the class?
3. If not, what materials would have made the class better?
4. How appropriate were the class objectives to meeting the needs of the parents?
5. How appropriate were the class objectives to meeting the needs of the children?

Lesson 8

1. How appropriate were the materials provided for all lessons?
2. How appropriate were the lessons for meeting the needs of the parents?
3. How appropriate were the lessons for meeting the needs of the children?
4. Please tell us what you thought went well with the classes.
5. Please tell us what could be improved with the classes.
Appendix G: Fidelity of Implementation Evaluation Sample

iCook 4-H Fidelity

Session 1

Instructions for Use

Hello iCook 4-H Evaluator! The following evaluation tool is to be used only for the session specified. You will complete this evaluation throughout the session to determine fidelity of the session leader to the iCook 4-H Curriculum.

Within a week of completing the form, please return this form to your state dissemination contact.

State Dissemination Contact

Maine:    Kate Yerxa (kate.yerxa@maine.edu)
Nebraska: Kyla Richardson (kylaannrichardson@hotmail.com)
South Dakota: Emily Hofer (Emily.Hofer@sdstate.edu)
Tennessee: Marissa McElrone (marissa.mcelrone@gmail.com)
West Virginia: Rebecca Hagedorn (rlhagedorn@mix.wvu.edu)

To complete this evaluation, you will need:

- The session specific leader guide (The session leader you are helping will provide)
- A way to time different session activities (e.g. cell phone, stopwatch, wristwatch, clock)
General Information

Evaluator Name: 
State: 
Site Location: 
Session Leader: 

Number of Youth Present: 
Number of Youth Expected: 

Number of Adults Present: 
Number of Adults Expected: 

Expected Session Start Time: 
Actual Session Start Time: 

Expected Session End Time: 
Actual Session End Time: 

Objectives

1. What was the actual time of each of the following activities?

<table>
<thead>
<tr>
<th>Activity</th>
<th>Allotted (min)</th>
<th>Actual (min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Welcome and Introduction</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Pre-Program Evaluation and Documents</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Recipe for the Day</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Set: Overview of iCook</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Technology Training</td>
<td>55</td>
<td></td>
</tr>
<tr>
<td>Family Communication: Family Meal Journaling</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Wrap up and Take Home Message</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Participant Evaluation</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Leader Evaluation</td>
<td>10</td>
<td></td>
</tr>
</tbody>
</table>

2. Did the participants achieve the following objectives? (Yes or No)

<table>
<thead>
<tr>
<th>Objective</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Complete the preprogram evaluation?</td>
<td></td>
</tr>
<tr>
<td>Participate in technology training?</td>
<td></td>
</tr>
<tr>
<td>Review the Crunchy Berry Parfait recipe?</td>
<td></td>
</tr>
<tr>
<td>Make an introduction video?</td>
<td></td>
</tr>
<tr>
<td>Upload and Post an introduction video?</td>
<td></td>
</tr>
<tr>
<td>Review Family Meal Journal process?</td>
<td></td>
</tr>
</tbody>
</table>
3. In general, how interested were the adults in the session?

   Showed little engagement in the session

   Were somewhat engaged in the session

   Were engaged in the session

   Were actively engaged throughout the session

4. In general, how interested were the youth in the session?

   Showed little engagement in the session

   Were somewhat engaged in the session

   Were engaged in the session

   Were actively engaged throughout the session

5. In general, how effective was the leader in the session?

   Very ineffective
   Ineffective
   Effective
   Very Effective

6. How much did the leader refer to the leader guide/materials throughout the session?

   Unobserved   Never   Rarely   Sometimes   Very Often   Always

7. Check the program elements that were covered.

   Cooking Skills

   Physical Activity Skills
   Family Communication
   Goal Setting
   MyPlate

8. Were there adequate materials for the leader to teach the session?

   Yes    No
If Question 8 is no, what materials were missing?

Evaluator Demographics

10. Age:

11. Gender: Male   Female

12. Position:

   4-H Staff/Volunteer
   Extension Staff
   School Educator
   Student Researcher

   Other ________________________________
What is iCook 4-H?

- A multi-state USDA funded lifestyle approach to good health
- Series of hands-on sessions designed to improve culinary skills, eating habits, mealtime communication, physical activity, and health-related goal setting
- Comprehensive curriculum resources provided as well as training and training materials (both written and video) to prepare leaders for sessions
- Access to a secure website for interaction with other iCook families
  - Write and comment on status updates
  - Upload and view cooking and physical activity videos
  - Interact with games and health related challenges
- Community-based approach -- building community partnerships
  - Families will answer short web-based questionnaires about eating together, cooking skills, and physical activity
  - Families and leaders are also asked to provide feedback for program improvement and continuation

Example Adult Survey Questions:
- How often does your child help you cook meals?
- When you think about each day of the week, how often are you physically active for at least 30 minutes each day?
- How often is it stressful to eat together as a family?

Example Youth Survey Questions:
- Can you measure ingredients for a recipe by yourself?
- Can you wash and cut up vegetables with help from someone else?
- How often does your family play actively together?
### Our Curriculum

Each lesson includes a food group / nutrition focus, culinary skills training, food preparation, physical activity, communication improvement, and goal setting. The following is a summary of session contents:

<table>
<thead>
<tr>
<th>Lesson</th>
<th>Food Focus / Culinary Skills / Recipe</th>
<th>Physical Activity</th>
<th>Family Meals &amp; Communication / Goal Setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Healthy snacks - Fruit and yogurt parfaits</td>
<td>Introduction to iCook</td>
<td>Pre-program evaluations, technology training (website navigation, video uploading)</td>
</tr>
<tr>
<td>2</td>
<td>MyPlate - Knife skills, preparing produce - Fruit salsa w/ cinnamon chips</td>
<td>Circle game, intro activity</td>
<td>Components of successful family meals - setting SMART-R goals</td>
</tr>
<tr>
<td>3</td>
<td>Dairy - Food safety, blender use - Fruit and vegetable smoothies</td>
<td>Understanding heart rate, using heart &amp; lungs when active</td>
<td>Child parent mealtime dynamics, taste testing - Short- &amp; long-term goals</td>
</tr>
<tr>
<td>4</td>
<td>Vegetables - Knife skills, peeling, oven / stovetop, seasoning, meal planning - Oven roasted vegetables</td>
<td>Charades, resistance training</td>
<td>Place settings - Goal setting review and activity</td>
</tr>
<tr>
<td>5</td>
<td>Fruits - Grocery shopping, food labels, handling canned foods - Baked Apples</td>
<td>Stretching and flexibility</td>
<td>Quality communication - Goal setting review and activity</td>
</tr>
<tr>
<td>6</td>
<td>Grains - Makeover leftovers, proper reheating, stir-frying - Rice stir fry</td>
<td>iCook Shuffle, healthy downtown, sitting less &amp; moving more</td>
<td>Increasing family meal frequency and meal planning - Goal setting review and activity</td>
</tr>
<tr>
<td>7</td>
<td>Protein - Using seasonings, skillet skills, shredding - Lentil &amp; Cheese Quesadillas</td>
<td>Cup stacking relay race, active group / family games</td>
<td>Avoiding power plays at dinner - Goal setting review and activity</td>
</tr>
<tr>
<td>8</td>
<td>Making healthy recipes using MyPlate - MyPlate sushi</td>
<td>Active play</td>
<td>Post-program evaluations, reflection and discussion of lessons learned and how to move forward</td>
</tr>
</tbody>
</table>

### Proposed session dates for fall 2015:
- Session 1 - Week of September 14th
- Session 2 - Week of September 21st
- Session 3 - Week of October 5th
- Session 4 - Week of October 19th
- Session 5 - Week of November 2nd
- Session 6 - Week of November 16th
- Session 7 - Week of November 30th
- Session 8 - Week of December 8th

### Interested in iCook?

Contact Your State Liaison:
- ME: Kate Yerxa; kate.yerxa@maine.edu
- NE: To Be Determined
- SD: To Be Determined
- TN: Lauren Manuel; lmanuel@vols.utk.edu
- WV: Jade White; jwhite34@mix.wvu.edu
BIOGRAPHY OF THE AUTHOR

Jodi Lynn Randall was born in Dover-Foxcroft, ME on April 3rd 1989. She graduated as salutatorian of the Foxcroft Academy Class of 2007. She received a Bachelor of Arts in Psychology (2012) and Bachelor of Science in Food Science and Human Nutrition (2014) at the University of Maine.

As an avid hiker and nature enthusiast, Jodi aspires to one day complete the Appalachian trail and travel New Zealand on foot. As a tried-and-tested hopeless romantic she dreams of finding a companion to traverse these and other paths of life by her side. She has, and always has had, many and varied interests and as she forays into the field of nutrition she hopes to have the pleasure of working in varied environments. She hopes to combine nutrition with such interests as health psychology, brain growth and chemistry, and endurance athletics. Through life’s many complications she has found that the world, like the trail, provides. Though it does so on its own terms and timelines, this is a truth which can be relied on.

Jodi is a candidate for the Master of Science degree in Food Science and Human Nutrition from the University of Maine in December 2016.