



A Summary of the Evidence-Base for Five UC ANR Curricula Commonly Used by UC CalFresh:

*(1) Go, Glow, Grow; (2) Happy Healthy Me; (3)
My Amazing Body; (4) Good for Me and You;
and (5) It's My Choice*

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Introduction

The UC CalFresh Nutrition Education Program (UC CalFresh) provides nutrition and physical activity education in low resource public schools with funding from the United States Department of Agriculture's (USDA) Supplementary Nutrition Assistance Program Education (SNAP-Ed). The program is implemented in 32 counties across California by the UC Division of Agriculture and Natural Resources' (UC ANR) Cooperative Extension offices (UCCE). In FFY 2015, UC CalFresh services were provided in nearly 400 low-resource public schools reaching over 85,000 students. In recent years, USDA has placed an increased emphasis on the delivery of evidence based interventions and practices prompting SNAP-Ed funded agencies to compile the level of evidence supporting their existing curricula.

Description of the Project

The main focus of UC CalFresh is to deliver high quality direct education to elementary and preschool age children in low-resource schools and communities. In FFY 2015, UC CalFresh provided nutrition education in 361 K-12 schools, 171 preschools, 40 afterschool programs, and 65 other youth delivery sites (e.g. non-public school or community sites).

Currently, a number of the youth-oriented curricula provided by UCCE educators and teachers (extenders) through their SNAP-Ed CalFresh programs are categorized in the "emerging" evidence-based tier applying USDA's Checklist for Evidence-Based Approaches.¹ These include the five curricula listed below which were developed by UC ANR County Nutrition, Family, and Consumer Sciences Advisor (Sharon K. Junge, Emeritus Advisor) and are widely offered by UC CalFresh UCCE county programs:

- Go, Glow, Grow (GGG)² – Pre-K
- Happy Healthy Me...Moving, Munching and Reading Around MyPlate (HHM)³ – Pre-K to Grade 1
- My Amazing Body (MAB)⁴ – Grades K-1
- Good for Me and You (GMY) – Grade 2
- It's My Choice...Eat Right! Be Active (IMC) – Grade 3

The Checklist for Evidence-Based Approaches defines the "emerging" tier as practitioner-driven activities that have potential for obesity prevention but have not yet been formally evaluated. The next higher level "practice-tested" requires that "the approach is based upon published or unpublished evaluation reports and case studies by practitioners working in the field that have shown positive effects on individual

¹ USDA. Checklist for Evidence-Based Approaches. Excerpted from the Fiscal Year 2016 SNAP Education Plan Guidance: Appendix B. Available at: <https://snap.nal.usda.gov/materials/checklist-evidence-based-approaches>.

² Also adapted and developed by Rosemary Carter, UC CalFresh Program Manager.

³ Contributors also included Rosemary Carter and Amy Netemeyer, UCCE Placer-Nevada Counties.

⁴ Contributor Rosemary Carter, UCCE Placer-Nevada Counties.

behaviors, food/physical activity environments, or policies.” A considerable amount of research-based thought was incorporated into the development of these curricula.⁵ They were also tested and further refined with expert and practitioner input as well as pilot tested in several real world settings.⁶ Additional outcome evaluation data from UC CalFresh county programs are now available to support the earlier formative evaluation conducted with these curricula.

Evaluation Purpose and Methodology

The purpose of this evaluation was to assess the UC CalFresh FFY 2015 outcome evaluation data to determine if there was adequate evidence to move each of the five curricula developed by UC ANR (GGG, HHM, MAB, GMY, and IMC) from the “emerging” evidence-based tier to the “practice-tested” level. The evaluation involved two components: a retrospective teacher observation as well as a pre and post student survey.

Teacher Data

To evaluate these curricula (GGG, HHM, MAB, GMY, and IMC), UC CalFresh UCCE staff partner with teachers (extenders) to complete a retrospective Teacher Observation Tool (TOT) after delivering the last lesson in the curriculum (see Appendix A). This tool was developed and tested as an innovative approach to collecting data from a large number of classes that uses teachers’ observations to address some of the inherent challenges in measuring self-reported behavior among young children.⁷ Survey data were collected and entered into the UC CalFresh online data entry portal during FFY 2015 (October 1, 2014 to September 30, 2015). The TOT is part of the UC CalFresh Youth Program Evaluation approved by the UC Davis (UCD) Institutional Review Board (IRB).

The TOT captures teachers’ assessment of changes in their students’ behavior (5 items) as well as the teachers’ own behaviors and practices (5 items) to encourage positive nutrition and physical activity. Student items were assessed on a five point Likert scale ranging from “Strongly agree” to “Strongly disagree” with a response option also provided for “Unable to discover” to identify student behaviors not directly observed by teachers. The questions related to student behaviors were formatted as follows: “Compared to the beginning of the school year, **more** students **now** bring fruit and/or veggies as a snack.” Teachers’ behaviors and practices were captured on a four point Likert scale with response options for “A lot more often”, “Somewhat more often”, “About the same as before”, and “Not sure/unable to respond”. These items included one

⁵ Sharon Junge. Curriculum Design and Using Books to Teach Nutrition. Webinar: October 22, 2015. Available at: <http://www.uccalfresh.org/trainings/trainings>.

⁶ Personal communication with Sharon Junge, December 17, 2015.

⁷ Kaiser, L., Schneider, C., Neelon, M., Ganthavorn, C., Roche, B., Mendoza, C., & Matthiessen, T. (2013). Evaluation of Nutrition Outcomes in Youth: Challenges and Opportunities. In Trejos-Casillo, E. (Ed.), *Youth: Practices, Perspectives and Challenges* (pp. 3-15). New York: Nova Science Publishers.

additional response option (“Not applicable or no outside food allowed in class”) to delineate items that were not relevant based on classroom practices or policies. A sample teacher item is “Compared to the beginning of the school year, I (the teacher) now offer healthy food choices to the students (at parties, snacks, rewards).” In FFY 2015, 1,404 teachers participating in UC CalFresh across the state completed the retrospective TOT surveys on behalf of their 33,710 students. Out of this statewide evaluation, 303 TOT surveys representing 7,351 students reported results from a single UC ANR curriculum (GGG, HHM, MAB, GMY, or IMC) and therefore were included in this analysis. Surveys from teachers administering the curricula to students outside of the recommended grades for each curriculum were excluded. Data were analyzed to present the proportion of teachers responding “Agree”/“Strongly Agree” for student behaviors and “Somewhat”/“A Lot More Often” for teacher behaviors and practices. These results were compared with the UC CalFresh SMART Objectives developed to provide a marker for expected outcomes to demonstrate effective curriculum implementation.

Student Data

The second component of this evaluation involved student participants in EFNEP completing a self-administered pre/post survey to evaluate three of the curricula (HHM, MAB, and GMY). The HHM, MAB, and GMY curricula were evaluated using the Eat Well + Move survey. The tool is available in Appendix C. Sufficient matched, individual level data was not available for evaluation of the GGG or IMC curricula. Survey data were collected and entered into the Web-based Nutrition Education Evaluation and Reporting System (WebNEERS) during FFY 2015 (October 1, 2014 to September 30, 2015). The EFNEP program evaluation is federally required and classified as exempt by the UCD IRB.

The Eat Well + Move survey captures students’ ability to correctly identify images of kids engaged in healthy behaviors, as well as healthy food and drink items. Students were asked to circle images corresponding to a particular healthy behavior or food/drink item. The survey included six questions with four images per question. The questions included, “1. Circle kids being active.”, “Circle healthy snacks.”, “3. Circle vegetables.”, “4. Circle fruits.”, “6. Circle kids who should wash their hands before eating.” In FFY 2015, 49 students from three school classrooms in Kern county completed the Eat Well + Move pre/post survey as part of HHM curricula implementation, 161 students from eight school classrooms in Santa Clara county completed this survey as part of the MAB curricula, and 179 students from nine school classrooms in Santa Clara county completed it as part of GMY curricula implementation. Matched paired pre and post surveys were included in the analysis. Data were analyzed to determine the percentage of students who improved, had no change, or decreased in their ability to identify correct images displayed for each question. Paired t-tests were run to compare the mean score for correct responses (out of the four images displayed) from pre to post.

Findings

For all five of the curricula developed by UC ANR (GGG, HHM, MAB, GMY, and IMC), this report will first present a Curriculum Description with a brief summary of what the curriculum covers, its purpose, its target age-group, and key activities. This will be followed by the corresponding Evaluation Results which will include a summary of the UC CalFresh youth evaluation results from the TOT surveys, as well as from the available student surveys, collected in FFY 2015. Summary tables of the TOT results for each of the curricula are available in Appendix B. Summary tables of the student survey results for the HHM, MAB, and GMY curricula are available in Appendix D.

Go, Glow, Grow (GGG)

Curriculum Description: The GGG curriculum is designed to meet the specific needs and abilities of preschoolers. It provides opportunities for younger children to actively learn about healthy eating and exercise. Through this curriculum, preschoolers will make the connection between eating healthy foods and being able to Go, Glow and Grow. The nutrition objectives include recognizing MyPlate, identifying Go, Glow, and Grow foods, knowing that children need physical activity every day, and how to appropriately wash their hands. Using a simplified version of MyPlate, children learn the connection between healthy foods and what they do for the body.

- Grains are Go foods - they help you run, jump and play all day.
- Fruits and vegetables are Glow foods - they help you have shiny hair and sparkly eyes.
- Dairy and protein are Grow foods - they help you to grow big and strong.

Each lesson includes teacher background information, two activities, snack recipes, and review questions. There is also a take home letter telling parents what their child learned along with an activity and snack recipe to make at home. The curriculum has six lessons: 1) GGG Introduction, 2) Go Foods, 3) Glow Foods, 4) Grow Foods, 5) Exercise and 6) Handwashing. The curriculum's objectives are to:

- Teach young children to identify healthy foods.
- Teach young children to understand the benefits of eating healthy foods.
- Promote an active lifestyle in young children.
- Teach young children the importance of hand washing.
- Promote healthy life-long eating habits in young children.

Evaluation Results: Evaluation data for GGG come from the 52 teachers who completed the retrospective TOT survey after delivering the GGG curriculum to their classes. A total of 1,303 preschool students were observed. Six county programs (Alameda, Imperial, Placer, San Joaquin, Santa Clara, and Shasta) collected and submitted survey data for this analysis. The TOT results for GGG are summarized below by Healthy Food Choices and Trying New Foods, Fruits and Vegetables, Physical Activity, and Hand Washing.

A. Healthy Food Choices and Trying New Foods

More than three out of four teachers reported that compared to the beginning of the school year, more students now can identify healthy food choices (90% Agree/ Strongly agree) and are willing to try new foods offered at school (81% Agree/ Strongly agree). Both of these findings surpass the UC CalFresh SMART Objectives of at least three-quarters ($\geq 75\%$) of teachers, demonstrating the efficacy of the curriculum in improving students' ability to identify healthy food choices and willingness to try new foods.

Many teachers also perceived changes in their own behaviors and practices when reflecting back to the beginning of the school year, indicating that they now offer healthy food choices to the students at parties, snacks, rewards (79% A lot/ Somewhat more often), remind families to bring healthy snacks for school parties (67% A lot/ Somewhat more often), encourage students to eat breakfast (79% A lot/ Somewhat more often), and make healthier personal food choices (79% A lot/ Somewhat more often).

B. Fruits and Vegetables

The majority of teachers reported that compared to the beginning of the school year more students now bring fruit and/or veggies as a snack (54% Agree/ Strongly agree) and choose fruits and/or veggies in the cafeteria or during classroom parties (67% Agree/ Strongly agree).

C. Physical Activity

Compared to the beginning of the school year, most teachers report being more likely to encourage the students to be physically active (88% A lot/ Somewhat more often).

D. Hand Washing

Almost all teachers reported that compared to the beginning of the school year students now wash hands more often before handling food (96% Agree/ Strongly agree).

Happy Healthy Me...Moving, Munching and Reading Around MyPlate (HHM)

Curriculum Description: HHM is a nutrition and literacy curriculum that helps children become aware of food and nutrition by reading storybooks with food-related themes and participating in hands-on nutrition education and physical activities. It was designed for use with Pre-K through Grade 1.

Children are introduced to a variety of nutrition, food, and fitness concepts through high quality children's storybooks. Hands on, interactive nutrition and physical activities support the story and nutrition themes. MyPlate and the 2010 Dietary Guidelines are the

cornerstone of the curriculum. Lessons focus on an introduction to MyPlate, each of the five food groups, healthy snacks, exercise, and hand washing. Exposure to new foods and activities are done in a fun and non-threatening manner. Curriculum can be used in schools.

The curriculum has 9 lessons: 1) MyPlate, 2) Vegetable Group, 3) Fruit Group, 4) Grain Group, 5) Protein Group and 6) Dairy Group, 7) Snacks, 8) Kids on the Move, and 9) Wash Your Hands! Each lesson provides the educator with the information needed to successfully deliver the information and activities. Each lesson includes a lesson preview, objectives, book overview, background information with two nutrition activities and one physical activity to achieve the lesson objective.

The curriculum's objectives are that 4- to 6-year-old children will:

- Recognize MyPlate and know it is a guide for healthy eating.
- Identify the five food groups: vegetables, fruits, grains, protein, and dairy.
- Sort foods according to the five food groups.
- Describe the health benefits of each food group.
- Know they need physical activity every day.

Evaluation Results: Evaluation data for HHM come from both teacher and student surveys. Teacher evaluation data come from the 146 teachers who completed the retrospective TOT survey after delivering the HHM curriculum to their classes. A total of 3,542 students from preschool to third grade were observed. Nine county programs (Fresno, Kings, Placer, Santa Barbara, Santa Clara, Shasta, Sutter, Tehama, and Tulare) collected and submitted survey data for this analysis. Student evaluation data come from a total of 49 matched pre and post Eat Well + Move student surveys collected from three kindergarten to second grade classrooms in Kern county. The TOT and student results for HHM are summarized below by Healthy Food Choices and Trying New Foods, Dairy (student data only), Fruits and Vegetables, Physical Activity, and Hand Washing.

A. Healthy Food Choices and Trying New Foods

a. Teacher Results

Almost all teachers reported that compared to the beginning of the school year, more students now can identify healthy food choices (96% Agree/ Strongly agree) and are willing to try new foods offered at school (97% Agree/ Strongly agree). Both of these findings surpass the UC CalFresh SMART Objectives of at least three-quarters ($\geq 75\%$) of teachers, demonstrating the efficacy of the curriculum in improving students' ability to identify healthy food choices and willingness to try new foods.

Many teachers also perceived changes in their own behaviors and practices when reflecting back to the beginning of the school year, indicating that they now offer healthy food choices to the students at parties, snacks, rewards (77% A lot/ Somewhat more often), remind families to bring healthy snacks for school parties (73% A lot/ Somewhat more often), encourage students to eat breakfast (73% A lot/ Somewhat more often), and make healthier personal food choices (82% A lot/ Somewhat more often).

b. Student Results

From pre to post survey, 41 percent of students improved in their ability to correctly identify images of healthy snacks. Although not statistically significant, students chose more correct responses in identifying health snacks at the post-test when compared to the pre-test (mean of 3.1 versus 2.94, respectively).

B. Dairy Foods

a. Student Results

The largest improvement in identifying correct images from pre to post survey was found in identification of dairy foods with 57 percent of students showing improvement in their ability to identify dairy foods. The mean correct responses significantly improved from 2.10 to 2.84 ($p < .001$).

C. Fruits and Vegetables

a. Teacher Results

Approximately three out of four teachers reported that compared to the beginning of the school year more students now bring fruit and/or veggies as a snack (74% Agree/ Strongly agree) and choose fruits and/or veggies in the cafeteria or during classroom parties (82% Agree/ Strongly agree).

b. Student Results

Approximately one-third of students showed improvements in identifying fruits and vegetables: 37 percent of students improved in fruit identification and 31 percent improved in vegetable identification. The pre to post mean score for correct responses significantly improved from 3.10 to 3.45 ($p < .05$) for fruit and from 2.82 to 3.14 for vegetables ($p < .05$).

D. Physical Activity

a. Teacher Results

Compared to the beginning of the school year, most teachers report being more likely to encourage the students to be physically active (86% A lot/ Somewhat more often).

b. Student Results

Students were better able to identify images of kids being active, with 35 percent of students improving their scores from pre to post. The mean correct responses significantly improved from 3.10 to 3.49 ($p < .05$).

E. Hand Washing

a. Teacher Results

The vast majority of teachers reported that compared to the beginning of the school year students now wash hands more often before handling food (90% Agree/ Strongly agree).

b. Student Results

Over a fifth (22%) of students were better able to identify images of kids who should wash their hands before eating. Although not statistically significant, the mean correct responses improved from 2.78 to 2.86.

My Amazing Body (MAB)

Curriculum Description: MAB is a nutrition curriculum that teaches students to learn about the amazing things their body can do and explore how they can keep their bodies healthy through eating nutrient-rich foods, getting plenty of exercise and sleep, and practicing good hygiene. Curriculum can be used during school, after school and with 4-H programs. It was revised in 2013 to reflect the California Common Core: English-Language Arts.

MAB was designed for use with Kindergarten through Grade 1. The curriculum has 5 lessons: 1) Keeping My Amazing Body Healthy, 2) Feeding My Amazing Body, 3) Keeping My Amazing Body Active, 4) Keeping My Amazing Body Rested, 5) Keeping My Amazing Body Clean.

Three to five specific learner outcomes are identified for each lesson. Each lesson has a featured book (either a narrative or information book), selected to introduce and build background knowledge for the students on the lesson content. The core concepts of the lesson are presented in an interactive activity that builds on the book reading. Each lesson builds on the prior lesson and should be taught in the order presented. Easy to implement ideas that reinforce the learning and enhance the classroom environment are included for the educator in each lesson. Students are encouraged to try a new fruit or vegetable in each lesson. Parent involvement is critical for making healthy behavioral changes. Each lesson includes a family flyer with easy to implement strategies that reinforce the lesson's nutrition and health messages. In addition, a one page sheet on the featured fruit or vegetable used in the classroom tasting activity, including a simple to prepare recipe, is provided to send home to families to reinforce the tasting.

The curriculum's objectives are that students will:

- Increase their consumption of fruits, vegetables and whole grains.
- Expand the variety of their diets.
- Recognize MyPlate and identify it as a guide to healthy eating.
- Describe the importance of nutrition, exercise, sleep and hand washing to a healthy body.

Evaluation Results: Evaluation data for MAB come from both teacher and student surveys. Teacher evaluation data come from the 17 teachers who completed the retrospective TOT survey after delivering the MAB curriculum to their classes. A total of 338 students from first to third grade were observed. Seven county programs (Fresno, Imperial, Placer, Santa Clara, Shasta, Tehama, and Trinity) collected and submitted survey data for this analysis. Student evaluation data come from a total of 161 matched pre and post Eat Well + Move student surveys collected from eight kindergarten to second grade classrooms in Santa Clara county. The TOT and student results for MAB are summarized below by Healthy Food Choices and Trying New Foods, Dairy (student data only), Fruits and Vegetables, Physical Activity, and Hand Washing.

A. Healthy Food Choices and Trying New Foods

a. Teacher Results

Almost all teachers reported that compared to the beginning of the school year, more students now can identify healthy food choices (94% Agree/ Strongly agree) and are willing to try new foods offered at school (100% Agree/ Strongly agree). Both of these findings surpass the UC CalFresh SMART Objectives of at least three-quarters ($\geq 75\%$) of teachers, demonstrating the efficacy of the curriculum in improving students' ability to identify healthy food choices and willingness to try new foods.

Many teachers also perceived changes in their own behaviors and practices when reflecting back to the beginning of the school year, indicating that they now offer healthy food choices to the students at parties, snacks, rewards (94% A lot/ Somewhat more often), remind families to bring healthy snacks for school parties (88% A lot/ Somewhat more often), encourage students to eat breakfast (88% A lot/ Somewhat more often), and make healthier personal food choices (65% A lot/ Somewhat more often).

b. Student Results

Well over a third (38 percent) of students improved in their ability to identify healthy snacks, from pre to post survey. Overall, the mean score for correct responses significantly improved from pre to post (3.22 to 3.58, $p < .001$).

B. Dairy Foods

a. Student Results

Nearly two-thirds (63%) of students were better able to identify dairy foods after participating in MAB. The mean score for correctly identified dairy foods rose significantly from 1.98 at pre-test to 2.93 at post-test ($p < .001$).

C. Fruits and Vegetables

a. Teacher Results

The vast majority of teachers reported that compared to the beginning of the school year more students now bring fruit and/or veggies as a snack (88% Agree/ Strongly agree) and choose fruits and/or veggies in the cafeteria or during classroom parties (71% Agree/ Strongly agree).

b. Students Results

Over a quarter of students (26%) were better able to identify fruit and over a third (35%) were better able to identify vegetables after the MAB intervention. Students mean correct response score for fruit identification improved from 3.36 to 3.64 ($p < .001$), as well as for vegetable identification, from 3.14 to 3.47 ($p < .001$).

D. Physical Activity

a. Teacher Results

Compared to the beginning of the school year, most teachers report being more likely to encourage the students to be physically active (94% A lot/ Somewhat more often).

b. Student Results

Well over a third (37%) of students improved in identifying images of kids being active. From pre to post, the mean score for correct responses significantly increased from 3.24 to 3.59 ($p < .001$).

E. Hand Washing

a. Teacher Results

All teachers reported that compared to the beginning of the school year students now wash hands more often before handling food (100% Agree/ Strongly agree).

b. Student Results

Over half of students (52%) were better able to identify the images of kids who should wash their hands before eating. The mean score for correct

responses increased significantly from 2.16 at the pre-test to 2.78 during the post-test ($p < .001$).

Good for Me and You (GMY)

Curriculum Description: In this curriculum, students explore a healthy body and lifestyle, study MyPlate, and learn about nutrients and what they do for their bodies. Students also learn that eating breakfast, drinking healthy beverages, exercising and keeping food safe are good for their body. This curriculum can be used during school, after school and with 4-H programs. California Common Core Standards for English-Language Arts.

GMY was designed for students in Grade 2. The curriculum has 5 lessons: 1) Eating Healthy is Good for Me and You, 2) Breakfast is Good for Me and You, 3) Healthy Snacks and Beverages are Good for Me and You, 4) Exercise is Good for Me and You, 5) Keeping Food Safe for Me and You.

For each lesson, three to five specific learner outcomes are listed. Each lesson has a featured book (either a narrative or information book), selected to introduce and build background knowledge for the students on the lesson content. Interactive activities that build on the book reading present the core concepts of the lesson. Educators receive ideas they can implement which support learning and enrich the classroom environment within the lesson. Educators are able to encourage students to try a new fruit and vegetable in each lesson. In terms of the parent's role, parent involvement is essential to behavioral change in the student. Lesson support materials for the parents include a family flyer with easy to implement strategies to reinforce their child's learning in addition to one-page sheets on the fruit or vegetable tasted in the classroom. This sheet also includes a simple recipe which further reinforces the lesson.

The curriculum's objectives are that students will:

- Recognize MyPlate and identify it as a guide to healthy eating.
- Describe the health benefits provided by foods from each of the five food groups.
- Increase their consumption for fruits, vegetables and whole grains.
- Expand the variety in their diets.

Evaluation Results: Evaluation data for GMY come from both teacher and student surveys. Teacher evaluation data come from the 30 teachers who completed the retrospective TOT survey after administering the GMY curriculum with their classes. A total of 780 students from first to third grade were observed. Seven county programs (Imperial, Kings, Placer, Santa Barbara, Santa Clara, Shasta, and Trinity) collected and submitted survey data for this analysis. Student evaluation data come from a total of 179 matched pre and post Eat Well + Move student surveys collected from nine kindergarten to second grade classrooms in Kern county. The TOT and student results

for GMY are summarized below by Healthy Food Choices and Trying New Foods, Dairy (student data only), Fruits and Vegetables, Physical Activity, and Hand Washing.

A. Healthy Food Choices and Trying New Foods

a. Teacher Results

The vast majority of teachers reported that compared to the beginning of the school year, more students now can identify healthy food choices (100% Agree/ Strongly agree) and are willing to try new foods offered at school (87% Agree/ Strongly agree). Both of these findings surpass the UC CalFresh SMART Objectives of at least three-quarters ($\geq 75\%$) of teachers, demonstrating the efficacy of the curriculum in improving students' ability to identify healthy food choices and willingness to try new foods.

Over two-thirds of teachers also perceived changes in their own behaviors and practices when reflecting back to the beginning of the school year, indicating that they now offer healthy food choices to the students at parties, snacks, rewards (77% A lot/ Somewhat more often), remind families to bring healthy snacks for school parties (83% A lot/ Somewhat more often), encourage students to eat breakfast (67% A lot/ Somewhat more often), and make healthier personal food choices (73% A lot/ Somewhat more often).

b. Student Results

Over a third of students (34%) improved from pre to post in their ability to identifying healthy snacks. Overall, the mean score for correct responses students chose increased significantly from 3.43 to 3.63 ($p < .001$).

B. Dairy Foods

a. Student Results

A majority of students (68%) improved in their identification of dairy foods from the pre- to post-test. The mean score for correct responses was almost one full point higher from pre to post (2.34 to 3.31, $p < .001$).

C. Fruits and Vegetables

a. Teacher Results

Many teachers reported that compared to the beginning of the school year more students now bring fruit and/or veggies as a snack (70% Agree/ Strongly agree) and choose fruits and/or veggies in the cafeteria or during classroom parties (73% Agree/ Strongly agree).

b. Student Results

Nearly a fifth (18%) and over a quarter (27%) of students improved in their identification of fruits and vegetables, respectively. Although not statistically

significant, the mean correct responses in identifying fruits began quite high and increased from 3.63 to 3.71, while the increase in mean correct vegetable identifications from pre to post achieved statistical significance (3.31 to 3.68, $p < .001$).

D. Physical Activity

a. Teacher Results

Compared to the beginning of the school year, most teachers report being more likely to encourage the students to be physically active (77% A lot/ Somewhat more often).

b. Student Results

Over a fifth of students (21%) showed improvement in identifying images of kids being active from pre to post, with the mean score for correct responses rising significantly from 3.66 to 3.86 ($p < .001$).

E. Hand Washing

a. Teacher Results

The majority of teachers reported that compared to the beginning of the school year students now wash hands more often before handling food (70% Agree/ Strongly agree).

b. Student Results

Over half of students (56%) were better able to identify images of kids who should wash their hands before eating, from the pre- to post-test. Mean score for correct responses improved significantly by three-quarters of a point (2.46 to 3.21, $p < .001$).

It's My Choice... Eat Right! Be Active (IMC)

Curriculum Description: IMC is a nutrition curriculum where students examine the key nutrients from the MyPlate five food groups and learn how to make healthy choices. They identify how vitamins, minerals, carbohydrates, and proteins provide the building blocks needed for good health. The curriculum can be used during school, after school and with 4-H programs.

IMC was designed for students in Grade 3. The curriculum has 5 lessons: 1) It's My Choice...MyPlate and Exercise for Health!, 2) It's My Choice...Fruits and Vegetables Every Day!, 3) It's My Choice...Whole Grains Every Day!, 4) It's My Choice...Vary the Protein!, 5) It's My Choice...Choosing Healthy Beverages!

Three to five specific learner outcomes are identified for each lesson under the lesson objectives. Each lesson has a featured book (either a narrative or information book),

selected to introduce and build background knowledge for the students on the lesson content. The core concepts of the lesson are presented in an interactive activity that builds on the book reading. Lessons should be taught in the order presented since the information is continually built upon. Within the classroom, educators are given easy to implement ideas that support learning while enhancing the classroom environment. Additionally, students may choose to participate in trying a new food during the lesson. Parents and family play a tremendous role and influence on a child's nutrition and physical activity behavior. Each lesson includes a family flyer with easy to implement strategies that reinforce the lesson's nutrition and health messages. In order to reinforce the tastings that occur during the lesson, a one-page sheet on the featured fruit or vegetable which includes a recipe is sent home to families in order to reinforce the tasting.

The curriculum's objectives are that students will:

- Recognize MyPlate and identify it as a guide to healthy eating
- Describe the health benefits provided by foods from each of the five food groups
- Understand the concept of essential nutrients
- Increase their consumption of fruits, vegetables and whole grains
- Expand the variety in their diets
- Increase their physical activity

Evaluation Results: Teacher evaluation data come from the 58 teachers who completed the retrospective TOT survey after administering the IMC curriculum with their classes. A total of 1,388 students from Kindergarten to third grade were observed. Eight county programs (Fresno, Imperial, Kings, Santa Barbara, Santa Clara, Shasta, Tehama, and Trinity) collected and submitted survey data for this analysis. The TOT results for IMC are summarized below by Healthy Food Choices and Trying New Foods, Fruits and Vegetables, Physical Activity, and Hand Washing.

Teacher Results

A. Healthy Food Choices and Trying New Foods

Nearly all teachers reported that compared to the beginning of the school year, more students now can identify healthy food choices (98% Agree/ Strongly agree) and are willing to try new foods offered at school (95% Agree/ Strongly agree). Both of these findings surpass the UC CalFresh SMART Objectives of at least three-quarters ($\geq 75\%$) of teachers, demonstrating the efficacy of the curriculum in improving students' ability to identify healthy food choices and willingness to try new foods.

Over two-thirds of teachers also perceived changes in their own behaviors and practices when reflecting back to the beginning of the school year, indicating that they now offer healthy food choices to the students at parties, snacks, rewards (74% A lot/ Somewhat more often), remind families to bring healthy snacks for school

parties (69% A lot/ Somewhat more often), encourage students to eat breakfast (79% A lot/ Somewhat more often), and make healthier personal food choices (72% A lot/ Somewhat more often).

B. Fruits and Vegetables

The majority of teachers reported that compared to the beginning of the school year more students now bring fruit and/or veggies as a snack (66% Agree/ Strongly agree) and choose fruits and/or veggies in the cafeteria or during classroom parties (71% Agree/ Strongly agree).

C. Physical Activity

Compared to the beginning of the school year, most teachers report being more likely to encourage the students to be physically active (84% A lot/ Somewhat more often).

D. Hand Washing

Many teachers reported that compared to the beginning of the school year students now wash hands more often before handling food (78% Agree/ Strongly agree).

In addition, UC CalFresh analyzed pre/post 3rd to 5th Grade Nutrition Education Survey data collected by EFNEP from students participating in the IMC curriculum. Although improvements were observed from pre to post in the percent of students reporting health behaviors (eating, physical activity, and hand washing), these changes were not statistically significant. Detailed results from the analysis are not included in this report.

Conclusions and Recommendations

UC CalFresh FFY 2015 outcome evaluation data show improvements in teachers' assessment of changes in their students' behaviors as well as their own behaviors and practices to encourage healthy eating and physical activity for all five curricula developed by UC ANR. Overall, the most common changes observed by teachers among students were identifying healthy food choices and willingness to try new foods offered at school; whereas teachers were most likely to report improvements in encouraging students to be physically active. The positive outcomes were not limited to these three areas. In fact, the majority of teachers (54% to 100%) across all of the curricula reported improvements in a wide range of topics including healthy food, snack, and meal choices; trying new foods; encouraging physical activity; fruit and vegetable snacks and choices; and hand washing. Furthermore, the two UC CalFresh SMART Objectives were met by all five curricula demonstrating the efficacy of each of the curriculum in improving students' ability to identify healthy food choices and willingness to try new foods. Developing these critical skills and healthy intentions at an early age

contributes to building and reinforcing healthy habits that support lifelong health and wellness.

Student survey data measuring the effectiveness of the GMY, HHM, and MAB curricula further support the TOT findings. Significant differences in the mean number of correct responses from pre to post were found in questions addressing kids being active, vegetables, and dairy foods. Students were better able to identify healthy snacks and kids who should wash their hands before eating following both the GMY and MAB curriculum. Furthermore, students were better able to identify fruits after participating in the HHM and MAB curriculum. Student surveys assessing the IMC curriculum found non-significant improvements and therefore do not lend additional support to the TOT results. Based on these findings, future efforts should include identifying valid and reliable evaluation tools for children with sufficient developmental age to report behavioral outcomes related to participation in the IMC curriculum in order to continue to build the evidence base.

In addition to the data highlighted in this report, UC CalFresh also collects youth taste test data in over 5000 classes representing more than 100,000 students statewide. Interactive tasting activities are incorporated into most of the UCCE nutrition curricula delivered to students, including the five UC ANR curricula described in this report. Analysis of the statewide data show that following taste tests the majority of students report being willing to eat the featured food at school again and to ask for the featured food at home. These results complement the TOT and student survey findings by providing additional support for the efficacy of these curricula in shaping short term outcomes related to students' intentions to eat healthy foods at school and ask for them at home.

Collectively, the evidence available shows that all five UC ANR curricula (GGG, HHM, MAB, GMY, and IMC) support the development of critical skills and healthy intentions at an early age that contribute to building and reinforcing healthy eating and physical activity habits that support lifelong health and wellness.

This evaluation report was a collective effort of UC CalFresh county programs and the state office showing positive effects on both individual level behaviors of students and teachers as well as the food environment through improvements in classroom practices supporting a healthy diet. These findings provide overwhelming evidence for moving GGG, HHM, MAB, GMY, and IMC from the “emerging” evidence-based tier to the “practice-tested” level. UC CalFresh will continue to collaborate with UC ANR, UCCE, the Center for Nutrition in Schools and other partners to identify and pursue additional opportunities to advance the evidence level of these and other curricula used by UC CalFresh county programs.

APPENDIX A

UC CalFresh Teacher Observation Tool

Instructions: Thank you for the opportunity to work with your students. Your feedback is important to us. Please answer the following questions based on your observations of the students in your classroom during the past school year.

County: _____ School: _____

Grade (Choose what best fits your class): Preschool Kindergarten Grades 1-3 Grades 4-6

Number of Students: _____

Location of current school: Urban Rural Suburban

How many years have you taught school? _____

Please indicate which nutrition curriculum was used this year.

Go, Glow, Grow	Happy, Healthy Me	Nutrition to Grow On	Power Play	Farm to Fork	TWIGS	Hunger Attack	EatFit	My Amazing Body	Good for Me and You	It's My Choice ... Eat Right! Be Active!

Please answer the following questions based on your observations of the students in your classroom during the past school year.

	Strongly agree	Agree	Not sure	Disagree	Strongly disagree	Unable to discover
1. Compared to the beginning of the school year, more students now bring fruit and/or veggies as a snack.						
2. Compared to the beginning of the school year, more students now wash hands more often before handling food.						
3. Compared to the beginning of the school year, more students now can identify healthy food choices.						
4. Compared to the beginning of the school year, more students now are willing to try new foods offered at school.						
5. Compared to the beginning of the school, more students now choose fruits and/or veggies in the cafeteria or during classroom parties.						

A Summary of the Evidence-Base for Five UC ANR Curricula Commonly Used by UC CalFresh

	A lot more often	Somewhat more often	About the same as before	Not sure/unable to respond	Not applicable or no outside food allowed in class
6. Compared to the beginning of the school year, I (the teacher) <i>now</i> offer healthy food choices to the students (at parties, snacks, rewards).					
7. Compared to the beginning of the school year, I (the teacher) <i>now</i> encourage students to eat breakfast.					
8. Compared to the beginning of the school year, I (the teacher) <i>now</i> remind families to bring healthy snacks for school parties.					
9. Compared to the beginning of the school year, I (the teacher) <i>now</i> encourage the students to be physically active					
10. Compared to the beginning of the school year, I (the teacher) <i>now</i> make healthier personal food choices.					

How many times have you participated in our University of California youth nutrition education program before this year? _____

Please add any explanations or comments about your responses to the questions above.

APPENDIX B

Curriculum: Go, Glow, Grow (N=52 teachers; N=1,303 students)

Survey: Teacher Observation Tool (retrospective)

Counties: Alameda, Imperial, Placer, San Joaquin, Santa Clara, and Shasta

Grades	N	%
Preschool	52	100

Teacher observations of the students changes in their classroom during the past school year.	N	Agree/ Strongly Agree (%)	SMART Objective
1. Compared to the beginning of the school year, more students now bring fruit and/or veggies as a snack.	28	54	
2. Compared to the beginning of the school year, more students now wash hands more often before handling food.	50	96	
3. Compared to the beginning of the school year, more students now can identify healthy food choices.	47	90	≥ 75%
4. Compared to the beginning of the school year, more students now are willing to try new foods offered at school.	42	81	≥ 75%
5. Compared to the beginning of the school, more students now choose fruits and/or veggies in the cafeteria or during classroom parties.	35	67	

Teachers' self-reports about changes in their classroom during the past school year.	N	A Lot/ Somewhat More Often (%)	SMART Objective
6. Compared to the beginning of the school year, I (the teacher) now offer healthy food choices to the students (at parties, snacks, rewards).	41	79	
7. Compared to the beginning of the school year, I (the teacher) now remind families to bring healthy snacks for school parties.	35	67	
8. Compared to the beginning of the school year, I (the teacher) now encourage students to eat breakfast.	41	79	
9. Compared to the beginning of the school year, I (the teacher) now make healthier personal food choices.	41	79	
10. Compared to the beginning of the school year, I (the teacher) now encourage the students to be physically active.	46	88	

Curriculum: Happy Healthy Me (N=146 teachers; N=3,542 students)

Survey: Teacher Observation Tool (retrospective)

Counties: Fresno, Kings, Placer, Santa Barbara, Santa Clara, Shasta, Sutter, Tehama, and Tulare

Grades	N	%
Grades 1-3	25	17
Kindergarten	53	36
Preschool	68	47

Teacher observations of the students changes in their classroom during the past school year.	N	Agree/ Strongly Agree (%)	SMART Objective
1. Compared to the beginning of the school year, more students now bring fruit and/or veggies as a snack.	108	74	
2. Compared to the beginning of the school year, more students now wash hands more often before handling food.	132	90	
3. Compared to the beginning of the school year, more students now can identify healthy food choices.	140	96	≥ 75%
4. Compared to the beginning of the school year, more students now are willing to try new foods offered at school.	142	97	≥ 75%
5. Compared to the beginning of the school, more students now choose fruits and/or veggies in the cafeteria or during classroom parties.	120	82	

Teachers' self-reports about changes in their classroom during the past school year.	N	A Lot/ Somewhat More Often (%)	SMART Objective
6. Compared to the beginning of the school year, I (the teacher) now offer healthy food choices to the students (at parties, snacks, rewards).	112	77	
7. Compared to the beginning of the school year, I (the teacher) now remind families to bring healthy snacks for school parties.	107	73	
8. Compared to the beginning of the school year, I (the teacher) now encourage students to eat breakfast.	106	73	
9. Compared to the beginning of the school year, I (the teacher) now make healthier personal food choices.	120	82	
10. Compared to the beginning of the school year, I (the teacher) now encourage the students to be physically active.	126	86	

Curriculum: My Amazing Body (N=17 teachers; N=338 students)

Survey: Teacher Observation Tool (retrospective)

Counties: Fresno, Imperial, Placer, Santa Clara, Shasta, Tehama, and Trinity

Grades	N	%
Grades 1-3	17	100

Teacher observations of the students changes in their classroom during the past school year.	N	Agree/ Strongly Agree (%)	SMART Objective
1. Compared to the beginning of the school year, more students now bring fruit and/or veggies as a snack.	15	88	
2. Compared to the beginning of the school year, more students now wash hands more often before handling food.	17	100	
3. Compared to the beginning of the school year, more students now can identify healthy food choices.	16	94	≥ 75%
4. Compared to the beginning of the school year, more students now are willing to try new foods offered at school.	17	100	≥ 75%
5. Compared to the beginning of the school, more students now choose fruits and/or veggies in the cafeteria or during classroom parties.	12	71	

Teachers' self-reports about changes in their classroom during the past school year.	N	A Lot/ Somewhat More Often (%)	SMART Objective
6. Compared to the beginning of the school year, I (the teacher) now offer healthy food choices to the students (at parties, snacks, rewards).	16	94	
7. Compared to the beginning of the school year, I (the teacher) now remind families to bring healthy snacks for school parties.	15	88	
8. Compared to the beginning of the school year, I (the teacher) now encourage students to eat breakfast.	15	88	
9. Compared to the beginning of the school year, I (the teacher) now make healthier personal food choices.	11	65	
10. Compared to the beginning of the school year, I (the teacher) now encourage the students to be physically active.	16	94	

Curriculum: Good for Me and You (N=30 teachers; N=780 students)

Survey: Teacher Observation Tool (retrospective)

Counties: Imperial, Kings, Placer, Santa Barbara, Santa Clara, Shasta, and Trinity

Grades	N	%
Grades 1-3	30	100

Teacher observations of the students changes in their classroom during the past school year.	N	Agree/ Strongly Agree (%)	SMART Objective
1. Compared to the beginning of the school year, more students now bring fruit and/or veggies as a snack.	21	70	
2. Compared to the beginning of the school year, more students now wash hands more often before handling food.	21	70	
3. Compared to the beginning of the school year, more students now can identify healthy food choices.	30	100	≥ 75%
4. Compared to the beginning of the school year, more students now are willing to try new foods offered at school.	26	87	≥ 75%
5. Compared to the beginning of the school, more students now choose fruits and/or veggies in the cafeteria or during classroom parties.	22	73	

Teachers' self-reports about changes in their classroom during the past school year.	N	A Lot/ Somewhat More Often (%)	SMART Objective
6. Compared to the beginning of the school year, I (the teacher) now offer healthy food choices to the students (at parties, snacks, rewards).	23	77	
7. Compared to the beginning of the school year, I (the teacher) now remind families to bring healthy snacks for school parties.	25	83	
8. Compared to the beginning of the school year, I (the teacher) now encourage students to eat breakfast.	20	67	
9. Compared to the beginning of the school year, I (the teacher) now make healthier personal food choices.	22	73	
10. Compared to the beginning of the school year, I (the teacher) now encourage the students to be physically active.	23	77	

Curriculum: It's My Choice (N=58 teachers; N=1,388 students)

Survey: Teacher Observation Tool (retrospective)

Counties: Fresno, Imperial, Kings, Santa Barbara, Santa Clara, Shasta, Tehama, and Trinity

Grades	N	%
Grades 1-3	57	98
Kindergarten	1	2


Teacher observations of the students changes in their classroom during the past school year.	N	Agree/ Strongly Agree (%)	SMART Objective
1. Compared to the beginning of the school year, more students now bring fruit and/or veggies as a snack.	38	66	
2. Compared to the beginning of the school year, more students now wash hands more often before handling food.	45	78	
3. Compared to the beginning of the school year, more students now can identify healthy food choices.	57	98	≥ 75%
4. Compared to the beginning of the school year, more students now are willing to try new foods offered at school.	55	95	≥ 75%
5. Compared to the beginning of the school, more students now choose fruits and/or veggies in the cafeteria or during classroom parties.	41	71	

Teachers' self-reports about changes in their classroom during the past school year.	N	A Lot/ Somewhat More Often (%)	SMART Objective
6. Compared to the beginning of the school year, I (the teacher) now offer healthy food choices to the students (at parties, snacks, rewards).	43	74	
7. Compared to the beginning of the school year, I (the teacher) now remind families to bring healthy snacks for school parties.	40	69	
8. Compared to the beginning of the school year, I (the teacher) now encourage students to eat breakfast.	46	79	
9. Compared to the beginning of the school year, I (the teacher) now make healthier personal food choices.	42	72	
10. Compared to the beginning of the school year, I (the teacher) now encourage the students to be physically active.	49	84	

APPENDIX C

Eat Well + Move Survey Tool





Eat Well + Move



Name or ID

Date

1. Circle kids being active.



Youth ID _____ Pre Post

K-2 Evaluation

2. Circle healthy snacks.



3. Circle vegetables.



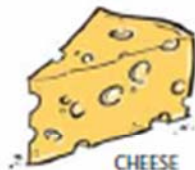
4. Circle dairy foods.



EGG



MILK



CHEESE



BREAD



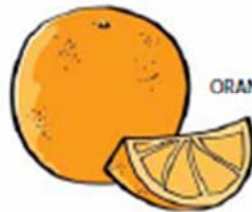
5. Circle fruits.



STRAWBERRIES



PEAR



ORANGE



CARROTS



6. Circle kids who should wash their hands before eating.



For Staff

This tool is for students in kindergarten, 1st or 2nd grade.

Curriculum

Grade

School

Teacher



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Appendix D

Curriculum: Happy Healthy Me (N=3 classes; N=49 students)

Survey: Eat Well + Move (pre/post)

Counties: Kern

Grades	N	%
Grades K-2	49	100

Students asked to circle correct images of... (N=49)	% Improved Pre to Post	% No Change Pre to Post	% Decreased Pre to Post
1. Kids being active.	35%	51%	14%
2. Healthy snacks.	41%	41%	18%
3. Vegetables.	31%	53%	16%
4. Dairy foods.	57%	35%	8%
5. Fruits.	37%	55%	8%
6. Kids who should wash their hands before eating.	22%	69%	8%

NOTE: The question scores are defined as the number of correct responses out for the four images displayed for each question (x/4). Totals may not equal 100% due to rounding.

Students asked to circle correct images of... (N=49)	Mean Correct Answers			
	Pre	Post	Diff	p-value
1. Kids being active.	3.10	3.49	0.39	<.05
2. Healthy snacks.	2.94	3.10	0.16	ns
3. Vegetables.	2.82	3.14	0.32	<.05
4. Dairy foods.	2.10	2.84	0.74	<.001
5. Fruits.	3.10	3.45	0.35	<.05
6. Kids who should wash their hands before eating.	2.78	2.86	0.08	ns

NOTE: The question scores are defined as the number of correct responses out for the four images displayed for each question (x/4). Statistic = Paired T-Test; ns = not significant

Curriculum: My Amazing Body (N=8 classes; N=161 students)

Survey: Eat Well + Move (pre/post)

Counties: Santa Clara

Grades	N	%
Grades K-2	161	100

Students asked to circle correct images of... (N=161)	% Improved Pre to Post	% No Change Pre to Post	% Decreased Pre to Post
1. Kids being active.	37%	52%	11%
2. Healthy snacks.	38%	50%	12%
3. Vegetables.	35%	50%	16%
4. Dairy foods.	63%	24%	14%
5. Fruits.	26%	63%	11%
6. Kids who should wash their hands before eating.	52%	37%	11%

NOTE: The question scores are defined as the number of correct responses out for the four images displayed for each question (x/4). Totals may not equal 100% due to rounding.

Students asked to circle correct images of... (N=161)	Mean Correct Answers			
	Pre	Post	Diff	p-value
1. Kids being active.	3.24	3.59	0.35	<.001
2. Healthy snacks.	3.22	3.58	0.36	<.001
3. Vegetables.	3.14	3.47	0.33	<.001
4. Dairy foods.	1.98	2.93	0.95	<.001
5. Fruits.	3.36	3.64	0.28	<.001
6. Kids who should wash their hands before eating.	2.16	2.78	0.62	<.001

NOTE: The question scores are defined as the number of correct responses out for the four images displayed for each question (x/4). Statistic = Paired T-Test; ns = not significant

Curriculum: Good for Me and You (N=9 classes; N=179 students)

Survey: Eat Well + Move (pre/post)

Counties: Santa Clara

Grades	N	%
Grades K-2	179	100

Students asked to circle correct images of... (N=179)	% Improved Pre to Post	% No Change Pre to Post	% Decreased Pre to Post
11. Kids being active.	21%	70%	9%
12. Healthy snacks.	34%	51%	16%
13. Vegetables.	27%	65%	8%
14. Dairy foods.	68%	21%	11%
15. Fruits.	18%	68%	14%
16. Kids who should wash their hands before eating.	56%	31%	12%

NOTE: The question scores are defined as the number of correct responses out for the four images displayed for each question (x/4).

Students asked to circle correct images of... (N=179)	Mean Correct Answers			
	Pre	Post	Diff	p-value
1. Kids being active.	3.66	3.86	0.20	<.001
2. Healthy snacks.	3.40	3.63	0.23	<.001
3. Vegetables.	3.31	3.68	0.37	<.001
4. Dairy foods.	2.34	3.31	0.98	<.001
5. Fruits.	3.63	3.71	0.08	ns
6. Kids who should wash their hands before eating.	2.46	3.21	0.75	<.001

NOTE: The question scores are defined as the number of correct responses out for the four images displayed for each question (x/4). Statistic = Paired T-Test; ns = not significant