

11-16-2024

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Recommended Citation

McVicker, S., Paulsen, L., Mlodzik, A., Henry, A., & Wolff, M. (2024). Virtual Culinary Nutrition Education: Youth and Parent/Guardian Acceptability of the SWITCH Cooking School. *The Journal of Extension*, 62(4), Article 20. <https://doi.org/10.34068/joe.62.04.20>

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Cover Page Footnote

We gratefully acknowledge the county 4-H/Extension staff, school partners, and undergraduate research assistants who helped pilot test the SWITCH Cooking School, as well as the funding provided by the Iowa State University College of Human Sciences Heddleson Junior Faculty Grant.

Virtual Culinary Nutrition Education: Youth and Parent/Guardian Acceptability of the SWITCH Cooking School

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Abstract. Face-to-face cooking programs can positively impact food choices, fruit and vegetable intake, and cooking self-efficacy; however, little is known about virtual cooking programs. We studied the perceived acceptability of the virtual SWITCH Cooking School (SCS). Four monthly cooking classes were offered for each participating school. Classes included nutrition education, food safety, and cooking demonstrations. Feedback was collected through post-class surveys and focus groups with parent/guardian and youth participants. Families valued the convenience of the virtual delivery and were interested in participating again. Future considerations for the SCS include incorporating additional variety of culinary skills and modifying registration methods.

INTRODUCTION

The School Wellness Integration Targeting Child Health (SWITCH) school wellness initiative seeks to help 4th-8th grade students “Switch what they Do, View, and Chew!” SWITCH was developed by researchers at Iowa State University (ISU) and is coordinated in partnership with ISU Extension and Outreach’s 4-H youth development program. Existing research shows that SWITCH is effective in promoting physical activity, decreasing screen time, and increasing fruit and vegetable consumption for students (McLoughlin et al., 2019; Rosenkranz et al., 2021).

Recent survey data continues to indicate that Iowa youth and adults are not meeting recommendations for fruit and vegetable consumption (Centers for Disease Control and Prevention (CDC), 2021; Endres et al., 2022). Adequate fruit and vegetable intake supports healthy immune functioning and is associated with lower risk of chronic disease and mortality rates (Childs et al., 2019; Wang et al., 2021). Face-to-face cooking programs with youth and families can be effective strategies for improving fruit and vegetable preferences; fruit and vegetable consumption; and attitudes towards food, cooking, and cooking self-efficacy (Cunningham-Sabo & Lohse, 2013; DeCosta et al., 2017; Garcia et al., 2020; Hersch et al., 2014). Cooking programs that help educate and equip individuals to prepare their own meals can support healthy choices, since food prepared in the home is

often more nutritious than food prepared outside the home (Moyeda-Carabaza et al., 2021; Wolfson & Bleich, 2014; Zong et al., 2016). While virtual programs can provide a more accessible format for nutrition education, the research on virtual cooking programs is limited.

Therefore, to promote fruit and vegetable consumption, support youth and families in cooking more at home, and engage children and families in SWITCH at home, we developed the SWITCH Cooking School (SCS). The SCS is an online teaching kitchen with live cooking classes focused on preparing simple and affordable recipes featuring vegetables from ISU Extension and Outreach’s *Spend Smart. Eat Smart.* website and app. The purpose of this study was to gauge how acceptable the SCS program is to youth and parent/guardian participants.

METHODS

PARTICIPANTS

In 2022, the SWITCH initiative engaged 41 elementary and middle schools in school wellness programming; eight elementary schools signed up to offer the SCS program. Participants eligible for the SCS included children in 4th through 8th grades and their families. We recommended that at least one parent/guardian be present during the SCS class, and other children and family members at home were also invited to participate.

We held one SCS class per school per month from January through April via Zoom, an online video-conferencing platform. We limited each class to eight families in order to promote an environment in which participants could engage and to allow facilitators to provide more individualized feedback while cooking. Families could register to participate in one to four classes, which allowed for more flexibility in families' schedules and for more families to potentially participate over the four months that the program was offered.

PROGRAM DEVELOPMENT AND IMPLEMENTATION

We developed the SCS program based on social cognitive theory (SCT), which posits that behavior is influenced and determined by the interaction of one's personal and social environment (Bandura, 1977). Examples of key SCT concepts incorporated into the program include self-efficacy and behavioral capability through skill development training, social modeling, and feedback/encouragement while cooking; outcome expectations through education that focuses on nutrients, food sources, and health implications; and observational learning through cooking demonstrations with trained facilitators.

At least two trained adult facilitators lead each program session, including a county 4-H/Extension staff member and a university research assistant studying dietetics. In November 2021, prior to program kickoff, we held a four-hour SCS training over Zoom to teach facilitators the cooking school content and logistics and allow them to participate in a live demonstration of an SCS class. We provided facilitators with lesson plans, PowerPoint presentations, grocery shopping lists, and marketing materials through a shared online drive. Facilitators used either a computer with one to two screens and/or an iPad, both with web cameras, to host the classes and show the cooking demonstration.

Participants could download the free Zoom application and use their personal devices (e.g., laptop, iPad, smartphone) to participate in the cooking class. The 4-H Extension facilitator encouraged families to "pin" the facilitator's video in Zoom to see the demonstration for the entirety of the class. Families were invited to keep their web cameras on so the facilitators could monitor the participants' cooking progress. To avoid background noise, families were asked to keep their microphones muted so everyone could hear the facilitators' instructions clearly. Participants could ask questions and engage with the class activities through their device by unmuting to speak or using the Zoom chat box.

CLASS COMPONENTS

The 4-H Experiential Learning Model guided each class, all of which followed the same general format using the provided PowerPoint slides: a welcome and introductions, *Spend Smart. Eat Smart.* resources, nutrition education and scav-

enger hunt activity, live cooking demonstration, brain break activity, review questions via polling, and closing announcements (Table 1). Additionally, the facilitator guide suggested monthly incentives that could be given to the participating families and possibly utilized in making that month's recipe.

INGREDIENT KITS

Program organizers provided ingredient kits for each month's virtual SCS class free of cost to each registered family. We provided 4-H Extension facilitators with directions for what ingredients (and how much) were needed for each recipe. The facilitators adjusted the amount of each ingredient according to the number of family members, and the recipe was included in the kit. The ingredient kits also included the monthly suggested incentive items (e.g., spatulas) if the county had funds available to cover these items. The facilitators typically delivered the ingredient kits to the school for youth to take home at the end of the day or collaborated with a local grocery store for grocery pick-up. Families also received an email from the facilitators in advance of the class that included information about any basic ingredients (e.g., salt, pepper, oil) they may need to provide to prepare the recipe and other details, such as instructions to access the class on Zoom.

CLASS INTRODUCTION

To start the class, the facilitators welcomed participants and invited them to introduce themselves to the group. They provided an overview of the class and highlighted resources from the *Spend Smart. Eat Smart.* website (<https://spendsmart.extension.iastate.edu/>). All SCS recipes came from the *Spend Smart. Eat Smart.* website, which is a resource developed by ISU Extension and Outreach that aids individuals and families in meal planning, grocery shopping, and cooking.

NUTRITION EDUCATION AND BRAIN BREAKS

The nutrition education content for each class focused on a nutrient of the month, food safety tip, nutrition label reading, and food preparation skills. For example, facilitators focused on potassium one month; students learned about the function of this nutrient in the body and what common foods contain potassium. Additionally, each month included practice reading and interpreting nutrition labels, including a scavenger hunt in which youth were given the opportunity to find a food in their kitchen and practice reading the label. The food safety tips highlighted the CDC's "Four Steps to Food Safety": Clean, Separate, Cook, and Chill (CDC, 2023).

To incorporate the "switching what kids DO" as part of the SWITCH initiative, facilitators incorporated brain breaks—short segments of physical activity—into the SCS classes as time allowed. The university student facilitators led the brain breaks to allow youth the opportunity to be active for about five minutes once during each class. The facilitators

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Table 1. SWITCH Cooking School Content Map, 2022

Class Component	Month			
	January	February	March	April
Recipe	Roasted Tomato and Spinach Pasta	Zucchini Hummus Wrap with After School	Cheesy Broccoli Soup	Easy Roasted Veggies and Broiled Salmon
		Hummus <i>Alternative Recipe: Make Ahead Breakfast Burritos</i>		<i>Alternative Recipe: Chicken Fajitas with Guacamole</i>
Food Safety Focus	Clean	Chill	Cook	Separate
Kitchen Tips/ Cooking Terms	Boil, Simmer, Colander	Sauté, Brown, Blend, Puree	Roux, Whisk, Ladle	Broil, Bake, Roast
		<i>Alternative Recipe: Sauté, Brown, Beat, Whisk</i>		<i>Alternative Recipe: Slice, Chop, Dice, Mince</i>
Nutrition Facts Label Skill Focus	Sodium	Fiber	Nutrients of Concern (Potassium)	Unsaturated Fats
Physical Activity “Brain Break”	Red Light, Green Light Video	Increase Your Beats	U R What You Eat Dance	GoNoodle Dance Video
Incentive Item	Strainer	Spatula	Soup Ladle	Chef’s Knife or Cutting Board
		<i>Alternative Recipe: Nonstick Slotted Spatula</i>		<i>Optional: Food Thermometer</i>

tors’ guide recommended a specific brain break to accompany each class (Table 1), though facilitators were allowed to choose from a list of brain break options.

COOKING DEMONSTRATION

After the nutrition education portion of the class, facilitators demonstrated cooking skills and the steps to prepare the recipe, positioning their web cameras towards the cutting board or stove/oven to allow the participants to see and follow along with the cooking process. Facilitators taught participants safe knife skills specific to the vegetables they used. Each class also focused on culinary terms that applied to the recipe being prepared.

Toward the end of the class, participants could engage in two poll questions focused on nutrition education and cooking terms to review the topics discussed in class. After the recipe was finished, families were encouraged to enjoy the meal together, and facilitators provided a conversation starter question prompt to encourage family dinner conversation.

DATA COLLECTION

Post-Class Survey

At the end of each class, facilitators shared a link to a post-class survey for parents/guardians and youth to complete; they sent reminder emails the day after the SCS and one week after the class. As an incentive, two gift cards were offered per class per school. Families who filled out the survey were entered into drawings, with one \$50 gift card awarded to parents/guardians and one \$25 gift card awarded to youth. The survey asked participants questions about the class experience, the online format, and the recipe prepared. Some survey questions were adapted from other Extension program surveys; other questions were created specifically for this program. Parents/guardians provided demographic information for themselves and their child. At the conclusion of the parent/guardian survey, they received a link for the youth survey.

Focus Groups

All families who participated in the SCS received an email invitation to participate in a focus group session in June 2022. The focus groups were conducted through Zoom and included both parents/guardians and their youth. Every participant received a \$25 gift card. The research coordinator facilitated the focus groups following a list of guided questions (Appendix).

DATA ANALYSIS

All surveys were administered online through Qualtrics. Researchers conducted data analysis with IBM SPSS Statistics (Version 28). They utilized descriptive statistics to summarize demographic characteristics and post-class survey question results. Research team members recorded audio of the focus groups and used REV.com, an IRB-approved transcription service, for a written transcription. Four research team members were involved in the analysis, which was based on Braun and Clarke's (2006) thematic analysis method. This study received exempt status from the Iowa State University Institutional Review Board (IRB ID: 21-465).

RESULTS

PARTICIPATION

There was a total of 189 participants, both youth and adult, in the SCS classes. This included 89 family signups representing 51 unique families, as some families participated more than once. On average, families attended 1.7 classes (range of 1-4 classes). We held a total of 25 classes between the eight schools. The average class size was 3.6 families or 7.6 people.

Participants completed a total of 116 post-class surveys (62 parent/guardian surveys and 54 child surveys) with a response rate of 61.4%. Of the 40 unique parents/guardians who completed post-class surveys, 100% were White and 90% were female; the average age of adult participants was 40.5 (SD = 4.7 years). The 34 unique youth participants who completed the post-class surveys were primarily White (97.1%), about half male (52.9%) and half female (47.1%), and 11.1 years old (SD = 1.2 years).

Twenty-one individuals (10 adults and 11 youth; 11.1% of class participants) participated in the focus groups. Parents/guardians were White females (100%), with an average age of 41.7 (SD = 5.1 years). Youth participants were White (100%), about half male (45%) and half female (55%), and approximately 10.8 years old (SD = 1.7 years).

SURVEYS

In the post-class surveys, 100% of parents/guardians and 98% of youth reported enjoying the class; 89% of parents/guardians reported being "satisfied" or "very satisfied" with the online format of the class (Tables 2 and 3). Additionally, 100% of parents/guardians reported being "likely" or "very

likely" to attend another class. The average rating of recipes was 4.48 (SD = 0.77) out of 5 stars for parents/guardians and 4.14 (SD = 0.94) for youth. When asked if they would like to prepare this recipe again, 100% of parents/guardians wanted to prepare the cheesy broccoli soup and chicken fajitas again; over 90% wanted to prepare the breakfast burritos and roasted tomato spinach pasta again. Youth participants responded that they would most like to make the chicken fajitas (90%) and the cheesy broccoli soup (89%) again.

THEMATIC ANALYSIS

Recurrent themes and subthemes from the thematic analysis included cooking involvement (cooking interest, trying new foods, confidence, family time, enjoyment), virtual format (convenience, kitchen familiarity, live interaction), program components (ingredient kits, nutrition education, knife skills), and future considerations (class registration, additional culinary skills) (Table 4).

Cooking Involvement

Parents expressed that they saw their youth become more interested in cooking in their home. Many mentioned that youth were helping set the table more often, helping in the kitchen, playing imaginary "bakery," and even purchasing a new cookbook to try new recipes. Parents and youth expressed that the SCS classes exposed them to new foods that they tried and often enjoyed. One parent explained that one child normally dislikes broccoli, but "because they made it, they ate it." Others expressed continuing to buy and use spinach after preparing the roasted tomato and spinach pasta recipe.

Youth described becoming more comfortable with cooking through the SCS experience, and parents also noticed more confidence in their youth. Families also expressed enjoying the unique experience of cooking together and having family time. One parent/guardian said: "I liked that it actually prompted me to cook with the kids." One child stated that cooking together was their favorite part of the classes. Overall, the focus group participants spoke of the SCS classes as a fun and enjoyable experience.

Virtual Format

Families found the virtual delivery of the SCS classes to be convenient. Parents/guardians shared that they valued the ease of logging into Zoom from their own kitchen.

It was nice to be in our house to do it and not have to go somewhere and then we could just clean up right away and put it away when we were done eating and we could just settle in for the night. (Parent/guardian)

Being able to cook from home allowed youth and families to become more comfortable in their own kitchens. Parents/

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Table 2. Parent/Guardian Post-Class Survey Responses

Survey Question	Response	n ^a	%
Did you enjoy the class?	Yes	61	100
	No	0	0
Please rate your satisfaction with the online format of the class.	Very Satisfied	38	62.3
	Satisfied	16	26.2
	Neutral	0	0
	Unsatisfied	0	0
	Very Unsatisfied	7	11.5
Would you like to prepare this recipe at home again?	Yes	58	95.1
	Unsure	1	1.6
	No	2	3.3
How likely are you to attend another SWITCH Cooking School class?	Very Likely	45	73.8
	Likely	16	26.2
	Neutral	0	0
	Unlikely	0	0
	Very Unlikely	0	0
How many stars would you give this recipe, with 1 star being not so good, and 5 stars being really good?	<i>M</i>		<i>SD</i>
		4.48	0.77

^a n = 61.

Table 3. Youth Post-Class Survey Responses

Survey Question	Response	n ^a	%
Did you enjoy the class?	Yes	47	97.9
	No	1	2.1
Would you like to prepare this recipe at home again?	Yes	38	77.6
	Unsure	9	18.4
	No	2	4.1
How many stars would you give this recipe, with 1 star being not so good, and 5 stars being really good?	<i>M</i>		<i>SD</i>
		4.14	0.94

^a n = 49.

guardians mentioned that they saw their youth getting more familiar with their own kitchen appliances and where items were kept.

While virtual communication can be a challenge, families shared that facilitators did a great job giving live feedback on specific food preparation and interacting with the participants to make sure they were following along well. One parent/guardian noted that “when they were blanching the broccoli, they were telling them this is what you look for, that bright green color. So, you know what you’re looking for each step is what he was saying was particularly helpful.”

Program Components

When asked what parts of class participants liked most, families reported valuing the ingredient kits, nutrition education, and knife skills education. Youth and parents/guardians reported that the ingredient kits were an “added extra surprise” and that having the specific ingredients provided was very helpful and an added convenience to the class. Parents/guardians shared that they valued the inclusion of nutrition education and food safety within the class. Participants noted that they enjoyed learning more than how to cook a new recipe. Additionally, parents/guardians saw their children enjoy

Table 4. Focus Group Thematic Analysis

Themes/Subthemes	Quotes
<i>Cooking Involvement</i>	
Cooking Interest	<p>“And I would say just his interest in cooking has been a big improvement. He even bought a cookbook to try some new recipes.” (P/G)</p> <p>“Yeah, she’s definitely more excited to help her dad cook and really got into serving and setting up the table, which has been really cool to see.” (P/G)</p>
Trying New foods	<p>“The spinach was the first one. And the tomatoes. And after that my kids would eat it whereas before they wouldn’t really. And so we’ve used, we buy spinach every time we go to the grocery store now and we cook with it a lot.” (P/G)</p> <p>“But because they made it, they ate it.” (P/G)</p>
Confidence	<p>“I would tell my friends to do it because you’re going to learn how to cook and you get to cook more often and it’s actually pretty fun to do it. And then so if you’re home alone and you’re with your siblings and it’s close to supper time, you could make them the food.” (Y)</p> <p>“I would say I think it helped with comfort or confidence in the kitchen for just some of those knife skills.” (P/G)</p>
Family Time	<p>“I guess my favorite part was cooking together with everyone.” (Y)</p> <p>“It was a good family experience. His sister even jumped in and helped for a while, and it was just the three of us spending time together.” (P/G)</p>
Enjoyment	<p>“But we really enjoyed it and I know that I talked to some of my friends about it and then they would sign up to do it. But yeah, it was really good.” (P/G)</p> <p>“We really did enjoy it a lot. It was just so different than anything else we’ve done. And he’s not a sports guy, so this was a nice chance for him to get involved in something.” (P/G)</p>
<i>Virtual Format</i>	
Convenient	<p>“It was nice to be in our house to do it and not have to go somewhere, and then we could just clean up right away and put it away when we were done eating and we could just settle in for the night.” (P/G)</p> <p>“We enjoyed it both times we did it. I think the Zoom was also very... We farm and so we have baby calves we have to feed and so it... because of the Zoom allowed him to be in it because it was just right there.” (P/G)</p>
Kitchen Familiarity	<p>“He said he likes cooking at home better, so he liked that part of it. It was nice to just be where you’re at with your things you’re familiar with.” (P/G)</p> <p>“She got to know where the stuff was in the kitchen and using our specific kitchen appliances. So I thought it was really a great learning opportunity to do it.” (P/G)</p>
Live Interaction	<p>“The instructor would have their camera on what they were doing and so it was easy to say, cut it this way, or...I think the preparation tips, the way they presented it was very helpful and easy to follow and remember.” (P/G)</p>
<i>Program Components</i>	
Ingredients Kits	<p>“And it was nice having the supplies provided, too. That was an added extra surprise.” (P/G)</p> <p>“Yeah I would say ingredients” [referring to most helpful part of SCS] (Y)</p>
Nutrition Education	<p>I really loved how the food safety and the nutrition facts were kind of tied in there.” (P/G)</p> <p>“She really liked finding the stuff on the label, the nutritional information, and we got to go quickly find something and then tell what was on it.” (P/G)</p>
Knife Skills	<p>“I’d say probably the thing that I liked most is she was able to, especially with the vegetables, learn how to use a knife correctly.” (P/G)</p> <p>“I learned how to do it, the recipe and how to use the cutting stuff, like the knives and the nutrition.” (Y)</p>

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Table 4. (continued)

Themes/Subthemes	Quotes
<i>Future Considerations</i>	
Class Registration	“I would say have your registration for all of them at once. So that you have the option for everything right from the outset.” (P/G) “I’d say one suggestion, just to put out there, is when you’re advertising it, maybe make it known that it’s kind of a no-hassle, stress-free, fun time, because I think people are intimidated by it, a little bit.” (P/G)
Additional Culinary Skills	“And I guess I’d like to see individual sessions tailored around specific skills. She mentioned knife handling skills and another session might be around utilizing herbs and spices.” (P/G) “I think it’d be cool to see maybe a bigger variety of things, even if they got into some desserts or using the oven a little bit more would be pretty cool to see.” (P/G)

Note. (P/G) indicates parent/guardian quote, (Y) indicates youth quote.

the nutrition facts label scavenger hunt activity. Both parents/guardians and youth described the opportunity to learn and practice knife skills as a valued component of the SCS classes.

Future Considerations

When asked what changes may help improve the SCS classes or if anything was missing, families shared some future considerations regarding registration and expanding on culinary skills. Some parents/guardians had some differing opinions on registration, with some feeling that registering all at once could be helpful while others preferred committing to one class at a time. Additionally, some families interested in more advanced cooking brought up the idea of adding additional culinary skills to the SCS classes, such as baking or preparing a dessert. Some parents/guardians expressed interest in holding different skill-focused classes for kids of different age levels.

DISCUSSION

The survey and focus group responses from parents/guardians and youth showed that participants enjoyed the virtual format of the SCS classes. Parents and youth found the virtual format convenient, and it enabled other family members to engage in the activity too. Flint Families Cook reported similar findings: that families expressed enjoying the convenience of being able to tune into cooking classes from home (Saxe-Custack & Egan, 2022). The reported enjoyment of the recipes prepared in the classes—and participants’ desires to prepare them again—show further acceptability. Additionally, all parents/guardians reported being likely or very likely to attend another SCS class.

There is still limited evidence of the efficacy of virtual cooking programs, particularly with children and families as participants. The findings of this study add to the literature on virtual cooking programs with youth and families and further supports the potential for reaching youth and families in their home environment through online programming. Families expressed that their perceived strengths of the program were the provided ingredient kits and the convenience of the virtual format. Families also found that the live feedback from the facilitators effectively engaged the youth and allowed them to follow the food demonstration successfully.

There are limitations to consider, however. Most participants were White, which limits the applicability of the study’s findings to more diverse populations. Additionally, families who did not have internet access or a device with which to connect to the Zoom class did not have the ability to participate. Additionally, the survey results included 7 parents/guardians who rated their satisfaction with the online format as “very unsatisfied.” However, we do not know if this was an error; 100% of parents/guardians said they enjoyed the classes and were either “very likely” or “likely” to attend another class, which seems at odds with the report of “very unsatisfied” participants.

CONCLUSION

Overall, parent/guardian and youth participants reported that the virtual format of the program was acceptable. Cooking in their own home was a valued convenience that enabled wider participation and encouraged family time. The virtual format allowed youth to become more comfortable with their own kitchen’s organization, cooking tools, and appliances.

Participants enjoyed the recipes used in the SCS classes and expressed the desire to prepare them again.

While this program and study was grant-funded, ongoing partnerships with the 4-H youth development program and local organizations could strengthen the sustainability of future SCS classes. Counties or schools interested in offering the programs could consider partnering with local businesses or grocery stores to help support program costs such as the ingredient kits.

Future research could evaluate the impact of the SCS on fruit and vegetable preferences and intake and evaluate methods of reaching more diverse populations. Additional considerations for modifying the SCS program in the future could include providing classes at various skill levels and modifying registration methods.

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Acceptability of the SWITCH Cooking School

APPENDIX. FOCUS GROUP QUESTIONS

1. When I say the word “cooking” what feelings or emotions comes to mind?
2. How did you hear about the SWITCH Cooking School, and then what made you want to sign-up or participate?
3. What did you like most about the SWITCH Cooking School? Least?
4. What did you think of participating in the SWITCH Cooking School virtually from home?
5. What parts, if any, of the SWITCH Cooking School classes were most helpful? Least helpful?
6. What changes, if any, have you noticed in yourself or your family since participating in the SWITCH Cooking School?
7. What changes do you think would make the SWITCH Cooking School classes better?
8. What, if any, particular moment during your experience in the SWITCH Cooking School made the biggest impression or impact on you (positive or negative)?
9. What would you tell another friend or family who was considering participating in the SWITCH Cooking School?
10. Is there anything else you would like to share today?