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Fork It

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CAPSTONE PROJECT PAPER

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A paper submitted in partial fulfillment of the
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By
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Specific Aims

Obesity prevalence is at an alarmingly high rate within the United States, but especially in rural areas of Kentucky. Obesity can lead to a variety of negative physical health outcomes including heart disease, diabetes, stroke, and some cancers. There are also mental disorders associated with obesity through mechanisms such as weight stigma and self-perception. Similar to obesity rates, prevalence and mortality associated of these health outcomes are also seen at disproportionately higher rates in rural, Appalachian Kentucky. Causes for increased obesity and obesity related consequences include some genetic factors as well as behavioral factors like physical inactivity, poor diet, stress, and lack of sleep.

Pike County, Kentucky is one of the Appalachian areas affected by obesity and obesity related consequences. The University of Pikeville students are a population within Pike County that are at increased risk of developing these same issues due to the poor eating habits present amongst college students and lack of concern towards chronic disease development at this life stage. However, due to university resources and capacity for collaboration, UPike students also present an opportunity for positive change during this developmental stage.

The "Fork It Program" addresses the problem of poor diet for UPike students by engaging them in a nutrition app and changing the food environment through a satellite farmer's market. Fork It will be adapted as an evidence-informed intervention using the protocol from "Use of Wearable Technology and Social Media to Improve Physical Activity and Dietary Behaviors among College Students: A 12-Week Randomized Pilot Study" (Pope et al., 2019). Tech based interventions like nutrition apps have been proven to work in this population by providing social support and personalized feedback to increase diet awareness and knowledge. Changes to the food environment have also been shown to be effective especially when paired with recipe delivery. The Fork It Program will partner with the Pike County Extension office to secure farmer's market vendors and UPike's Student Government Association (SGA) for app dissemination. These organizations provide expertise and already existing networks that will assist in program implementation.

The specific aims of the Fork It Program are:

1. Facilitate strong and sustainable partnerships with Extension and SGA to conduct program activities at the University of Pikeville

2. Implement a nutrition app and satellite market at the University of Pikeville to reach 2,700 students per year

3. Improve dietary behaviors of students at the University of Pikeville including increased home meal preparation and produce consumption

4. Evaluate the impact of the Fork It app on students' attitudes and knowledge regarding nutrition

Target Population and Need

Burden of Obesity

Obesity is an increasingly common health problem and impacts every state in the United States (US) greatly with all states having at least a 20% prevalence rate of obesity among adults (Centers for Disease Control and Prevention [CDC], 2022a). Obesity is defined as abnormal or excessive fat accumulation that presents a risk to health (World Health Organization [WHO], 2022a). A body mass index (BMI) over 25 is considered overweight, and over 30 is obese (WHO, 2022a). From 2017-March 2020 the US obesity prevalence was 41.9% which is a 30.5% increase from 1999-2000 (CDC, 2022b). Today, nearly 3 in 4 adults over the age of 20 have either overweight or obesity (National Heart, Lung and Blood Institute[NIH], 2022a).

Adult obesity prevalence in the United States was 32% from 2019 data (University of Wisconsin Population Health Institute [UWPHI], 2023). Obesity is markedly prevalent in the southeastern part of the United States with Kentucky having one of the highest rankings of obesity prevalence in the US at 36%, only behind West Virginia, Arkansas, Mississippi, and Oklahoma (UWPHI, 2023). The Appalachian region of Kentucky is disproportionately burdened with obesity with significantly higher rates amongst this region (Kentucky Health Facts, 2020). Pike County, where this project will be sited, sits on the border of
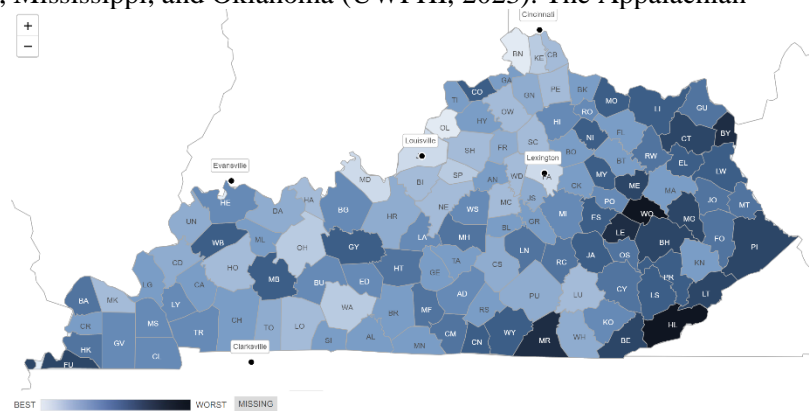
Figure 1: Adult Obesity in Kentucky (%)
University of Wisconsin Population Health Institute 2022 data

Kentucky and West Virginia, and had an obesity prevalence rate of 42% from 2019 data (UWPHI, 2023).

Obesity on its own is not the direct cause of the mortality witnessed from this disease. Rather, it is the numerous comorbidities that accompany obesity, especially cardiovascular disease, diabetes and some

cancers (Ward et. al, 2022). Each of these chronic disease challenges (cancer, stroke, diabetes) has multiple common causes, including poor diet, inadequate exercise, smoking, and excessive stress (Giovannucci et al., 2010; NIH, 2022b). While the exact portion of deaths from these chronic diseases that can be attributed to obesity is difficult to establish, one study estimated that nearly 500,000 deaths annually can be attributed to excess weight in the US (Ward et. al, 2022). So, while mortality rates for obesity are not easily discernable due to people dying from the complications with obesity instead, for Kentucky or Pike County, higher rates of deaths from conditions attributed to obesity can indicate a greater burden.

For Kentucky, the leading cause of death was heart disease with a mortality rate of 199.7 per 100,000 people (CDC, 2020). Other mortality rates for obesity-related deaths were 42.1 for stroke, 182.8 for cancer, and 62.9 (female)/78.4 (male) for diabetes, all per 100,000 (CDC, 2020; National Cancer Institute, 2023; Institute for Health Metrics and Evaluation [IHME], 2016). For Pike County, the mortality rates for heart disease, stroke, cancer, and diabetes were 246.2, 45.9, 215, and 84.3(female)/115.6(male) per 100,000, respectively (CDC, 2020; National Cancer Institute, 2023; IHME, 2016).

Table 1. Obesity rates and mortality rates by condition

	Pike County	Kentucky	United States
Obesity[1]	42%	36%	32%
Heart disease mortality (per 100,000)[2]	246.2	199.7	164.9
Stroke mortality (per 100,000)[2]	45.9	42.1	37.7
Cancer mortality (per 100,000)[3]	215	182.8	149.4
Diabetes mortality (per 100,000)[4]			
Female	84.3	62.9	49.6
Male	115.6	78.4	63.8

1 University of Wisconsin Population Health Institute

Serious health outcomes result from obesity. Consequences of obesity include high blood pressure (hypertension), high LDL cholesterol, low HDL cholesterol, or high levels of triglycerides (dyslipidemia) (CDC, 2022c). These are then mechanisms for more serious conditions including heart disease and stroke which can result in death (CDC, 2022c). Additionally, having obesity can lead to gallbladder disease, osteoarthritis (a breakdown of cartilage and bone within a joint), sleep apnea and breathing problems such as obesity hypoventilation syndrome (CDC, 2022c).

Additionally, there are non-physical consequences to obesity. It can lead to mental illness such as clinical depression, anxiety, and other mental disorders, and body pain and difficulty with physical functioning (CDC, 2022c). Weight stigma is one mechanism contributing to the emotional and psychological effects of obesity (Tomiyama, 2019). The stress from the various stigmatization present in society, employment, healthcare, and education can then create a vicious cycle as stress elicits a physiological response with hormones and chemicals that induces more obesity-causing behaviors (Tomiyama, 2019).

Risk Factors for Obesity

All social determinants of health provide pathways to obesity, but education and income are the most consistently reported linkage (Lakerveld & Mackenbach, 2017; CDC, 2022e). Like other counties in the region, these social determinants of health in Pike County are important risk factors for obesity. This is highlighted through the obesity prevalence breakdowns by education and income in Kentucky. Table 2 shows that lower educational attainment and lower income status have higher rates of obesity prevalence.

Table 2. Obesity prevalence by income and educational status

	Obesity Prevalence Rate (%)
Education	
Less than high school	45.8
High school	44.1
Some college	46.2
College graduate	32.2
Income	
Less than $25,000	48
$25-49,999	46.1
$50-74,999	41.5
$75000 or more	38.9

Source: United Health Foundation

While this same breakdown was not available for Pike County, it is important to note that only 78% of residents completed high school and the median household income was $38,900 for 2022 (UWPHI, 2023).

Behaviors that raise the risk for obesity include physical inactivity, unhealthy eating, and not getting enough sleep (NIH, 2022c). Other contributing factors are high amounts of stress, health conditions that can cause weight gain, genetics, and some medications (NIH, 2022c). Obesity is a complex disease and none of the factors described act in isolation. There are a myriad of environmental influences creating the context for these behaviors and factors. Diet, for example, can be influenced by the types of restaurants nearby or what foods are offered at supermarkets. A healthy diet includes eating plenty of fruits and vegetables, eating less fat (especially saturated), limiting sugar intake, and reducing salt intake (WHO, 2022b). Poor diet is a major risk factor for a number of health problems including heart disease, stroke, type 2 diabetes, obesity and some types of cancer (CDC, 2021). In addition to chronic illnesses, poor nutrition can have a number of negative effects on one's health such as impaired brain function, depression, low energy and motivation, etc. (Selhub, 2020).

Food insecurity is critical challenge to the healthy diets in the US, Kentucky, and particularly Appalachian Kentucky. During the year 2021, 10.2% of households were food insecure at least at some point nationally (U.S. Department of Agriculture, 2021). Food insecurity rates in Kentucky were reported at 14% for 2022 (UWPHI, 2023). For Pike County, 20% reported being food insecure, a rate higher than both state and national levels (UWPHI, 2023). Food insecurity is associated with lower fruit and vegetable consumption (Litton & Beavers, 2021).

Low rates of fruit and vegetable consumption are another critical challenge to healthy diets. Nationally, 20.3% of adults consumed vegetables less than one time per day for 2019 and 39.3% less than one time per day for fruit (CDC, 2015). For Kentucky, nearly 20% consumed vegetables less than one time per day in 2019 and 45.8% less than one time for fruit (CDC, 2015). While fruit and vegetable consumption were not available at the county level, Pike County has more fast-food restaurants per 100,000 people than state and national levels, 100.56, 72.77, and 75.89 respectively (CARES: University of Missouri Extension [CARES:UME, 2022). Fast food consumption has been associated with weight gain as well as lower fruit and vegetable consumption (Bezerra, Curioni, & Sichieri, 2012; Beydoun, Powell, Chen, & Wang, 2011).

College Students

College students, often taking independent control of their diet for the first time, are an excellent population with which to implement this intervention. The National College Health Risk Behavior Survey indicates that almost 35% of college students may have either overweight or obesity (Huang, Kempf, Strother, Li, Lee, Harris, & Kaur, 2004). In regard to dietary behaviors, fast food consumption rates vary by report but on conservative estimates are still concerning. It has been found that college students consume fast-food anywhere from 1-3 times per week to 6-8 times per week (Morse, & Driskell, 2009; Driskell, Kim, & Goebel, 2005). Additionally, Behavioral Risk Factor Surveillance System (BRFSS) data shows that a majority of young adults (aged 18-24 years) are not consuming enough fruits and vegetables

with 47% consuming less than 1 serving a day of fruit and 22.9% consuming less than 1 serving a day of vegetables in Kentucky for 2021 (CDC, 2015).

College students are in a developmental period of life making them a critical group to target. As recent high school graduates transition to a stage with likely more freedom, they may find themselves with a lack of parental guidance, new resources, and a different environment which can present a number of dietary changes (Wengreen, & Moncur, 2009). Additionally, due to life stage, students may not consider the risk of developing chronic diseases when making food choices (Kattelmann et al., 2014). Intervention strategies promoting healthier lifestyles have been successful for students in the higher educational setting, particularly interventions that seek to empower individuals through creating learning opportunities and offering support (Abu-Moghli, Khalaf, & Barghoti, 2010; Grim, Hortz, & Petosa, 2011; Knight & La Placa, 2013). Higher education has the capacity to provide support, resources, and qualified staff to establish healthy behavioral patterns that may continue throughout the lifespan.

Target Population: University of Pikeville

Pike County is Kentucky's easternmost county located in the Appalachian region of the state. It is a rural area marked by poverty, lower educational attainment, and worse health outcomes than counties across the state. As mentioned previously, Pike County has an obesity rate at 42% with food insecurity rates higher than state and national levels as well as more fast-food restaurants per 100,000 people. Pike County is predominantly White, 97.6%, with Black's comprising the second largest racial group at 0.8% (United States Census Bureau, 2022).

This intervention targets students at the University of Pikeville, who are roughly representative of the Pike County region from which most come. They follow similar demographic trends being predominantly White at 81.9% (Integrated Postsecondary Education Data System (IPEDS), 2021). They also demonstrate similar financial disadvantages with 90% of students receiving financial aid through grants in 2020 (IPEDS, 2021). Total enrollment is 2,645 students with 1,110 being undergraduates and

86.1% being full time (Rowe, 2022). Of the 1,110 undergraduate students, 450 are first year students (Rowe, 2022). Approximately 49% of UPike students live off campus with 51% living on campus (U.S News and World Report, 2022). As mentioned previously, college students in general present many unhealthy behaviors towards diet creating a vulnerable population. They are an ideal population for intervention, though, due to this developmental stage of life and the resources universities provide.

Existing Resources and Gaps

Pike County has some existing resources available to address food insecurity and nutrition challenges that will complement the proposed project. National programs like Snap and WIC are available through the health department to provide food assistance to eligible families. More locally, the University of Kentucky Cooperative Extension Service, Pike County Office (Extension), offers several programs for low-income residents, including EFNEP, the Expanded Food and Nutrition Education Program. This program focuses on food preparation, budgeting, food quality, and food resource management (University of Kentucky College of Agriculture, Food, and Environment, 2023).

The Extension service also offers the SNAP-Ed program, which is nutrition education for those who are SNAP eligible to help change their dietary behaviors (University of Kentucky College of Agriculture, Food, and Environment, 2023). Family and Consumer Sciences Extension offers "Building Strong Families" in Pike County which offers educational programs in accessing nutritious food including "Plate It Up" which features healthy recipes using Kentucky Proud food products (Kentucky Cooperative Extension Reporting, 2022).

Resources specifically dedicated towards university students are sparser. University of Pikeville does offer "What's Up Wednesday" through its Office of Student Activities where students are provided a home-cooked meal and comfort food, but the focus of this event is to create an environment to discuss challenges with acclimating to college (University of Pikeville, 2023). While not specifically diet related,

the Student Government Association is an active campus organization that strives to provide opportunities for UPike students, and has agreed to work closely with the proposed project.

Program Approach

Proposed Program

The Fork It Program is a dietary intervention targeted at the students at University of Pikeville to improve diet behaviors. Fork It uses a two-pronged approach: a phone-based app to address dietary habits and provide nutrition information and a partnership with the Pikeville Farmer's market to supply produce coupons to students to use at a satellite market.

Phone Based App

A smart-phone based app is an ideal technology for the target population of college students (Kelly, Mazzeo, & Bean, 2013). In developing the Fork It intervention, the protocol used in Pope et al's (2019) pilot study will be modified using findings from other diet intervention studies (Pope, Barr-Anderson, Lewis, Pereira, & Gao, 2019). Within the pilot study, Pope et al (2019) utilized smart watches to track nutrition and physical activity information, whereas in this intervention a smartphone app will be used, since student phone ownership is nearly universal. The phone application will have several features including nutrition tracking, personalized feedback, an interactive component and meal competitions. The use of a mobile application for this intervention is justified through the findings from the systematic review that youth-friendly approaches are more efficient and that college students specifically are comfortable and familiar with using the Internet as a source for health information (Kelly, Mazzeo, & Bean, 2013).

The homepage to the app will be the nutrition tracking platform. In this space users can track their daily food and beverage intake and physical activity. The database and features for this will be based on the My Fitness Pal app that has agreed to partner with UPike and allow the use of their features. Food can be searched using the search bar for an easy add with the pre-existing database. This internal app search

feature addresses the perceived social ramifications from checking nutrition labels found in previous studies (Kelly, Mazzeo, & Bean, 2013). This will allow for a more discreet way of viewing nutrition information and promote using nutrition labels as reference. Food items not in the app can be scanned in using their barcode. Additionally, food items and recipes can also be entered manually. The nutrition tracking platform will display caloric goals, caloric intake, foods consumed, and calories associated with each meal, and how many calories have been expended through exercise. There will be the option to view additional screens with a breakdown of macronutrients consumed. See photo for reference of this interface. Finally, the daily log will also have the option to be shared with other app users for members who want an accountability component.
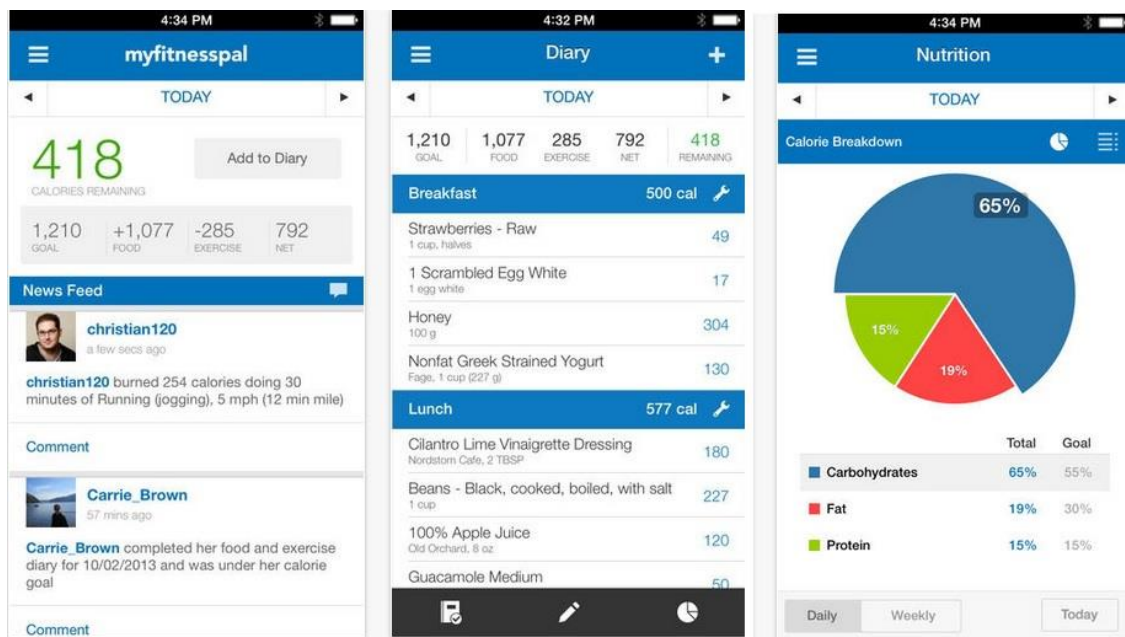
The use of nutrition apps for monitoring diet have been found to be effective for behavior change and weight reduction (Martin et al., 2015; Block et al., 2015). Specifically, though, nutrition apps in conjunction with personalized feedback have proven to be the most effective in achieving behavior change and weight loss (Hu, Nguyen, Langheier, & Shurney, 2020; Burke et al., 2012). The Fork It app will expand on the existing features of My Fitness Pal to achieve this. Within My Fitness Pal, there are recommendations and warnings on food items high in sodium, fat, or sugar as well as notifications when

the user is getting close to exceeding their nutrition goals. The Fork It app will expand this by also providing personalized tips and tricks to improve future food choices. For example, after the food entries have been input for the week, the app will analyze the data collectively to provide a Monday report. This report will show trends and areas of improvement such as "you consumed majority of your calories from carbohydrates last week and very little protein. Try to swap out some of your meals this week for higher protein choices such as fish, grilled chicken, or Greek yogurt." This type of feedback provides a more encompassing view of the user's diet rather than just day-to-day as well as solutions for improvement. A similar technique was used in a previous study using tailored feedback provided via remote coaches and was found to be effective (Spring et al., 2012). Providing this feedback via an electronic report rather than a coaching session accounts for the time barrier many college students face in making behavior changes. Internet-derived interventions are also a suitable choice because college students are familiar with this type of communication and previous studies have found this style of intervention to be effective for this population (Epton et al., 2014; Oosterveen, Tzelepis, Ashton, & Hutchesson, 2017).

Phone App- Social feature

Incorporating social support is a key part of an effective dietary intervention targeting college students. Social support can influence diet through encouragement, providing accountability, modeling or sharing a target behavior, and developing attitudes and habits based on interactions with others (Barrera, Toobert, Angell, Glasgow, & MacKinnon, 2006). Social networks have been found to impact eating behaviors greatly with the perceived influence of significant others as the most important factor, compared with the considerably lower influence of high school friends (Harmon, Forthofer, Bantum, & Nigg, 2016).

Social Cognitive Theory (SCT) provides opportunities for social support to achieve behavior change (Bandura, 2004). Within dietary interventions for college students, SCT is most often used to inform the intervention approaches (Kelly, Mazzeo, & Bean, 2013). Partnering with preestablished social

groups such as the Student Government Association (SGA) and Resident Life and Engagement can build a positive link between the personal and social aspects of dietary habits (Kelly, Mazzeo, & Bean, 2013).

The interactive component will be one of the main features to facilitate social support. Within the app, members will be able to post and engage with other members, similar to other media platforms like Facebook. They can encourage one another and provide different tips and advice for better dietary habits. This will allow for social encouragement as well as modeling and sharing the healthy behavior with other group members. Understanding the role social support plays into the dietary habits of college students is a crucial step in developing an intervention. To encourage students to cook more at home, there need to be components that make that change perceived as more feasible through having a support system of others participating and making the same changes. This allows for encouragement, support, and accountability.

Another feature in the Fork It app will be the "Recipes" tab. This tab will feature a variety of nutritious meals that can be prepared in less than an hour. Additionally, there will be a recipe "feature" each week that utilizes foods that are in season at the Pikeville Farmer's Market. A notification will be sent out each Friday that a new recipe is available. This recipe will also be preloaded into the database with the nutrition facts and calorie information for ease of the user. The recipe and nutrition information will all be verified through our registered dietician to ensure accuracy. One recent study conducted found that in multilevel approaches the main factors improving diet included some type of nutrition education, including providing healthy recipes (Gans, 2018).

The final feature on the app will be facilitating the weekly meal competitions from the meals the students have prepared themselves. Fitness and health challenges have been used in many aspects of health behavior to help facilitate change. For this intervention, users can post meals made using the produce from the farmer's market to enter them into the weekly meal competition. The goal is to try and create the healthiest meal with the most appeal. Voting will also be entirely user based to further the social aspect of the challenge. This not only provides healthy meal ideas for users, but also helps to

encourage cooking at home meals to be able to participate in the competitions. This feature encourages student engagement and ultimately helps assist in student retention to the Fork It program.

Pikeville Farmer's Market Partnership

The second part of Fork It's program approach will be the partnership with Pikeville Farmer's Market. Hu's study mentioned previously that supports the use of a digital platform for weight reduction also concluded that this reduction is most meaningful when combined with a change in one's food purchasing environment (Hu, 2020). In Hu's study this was done through offering healthy options via online ordering and grocery delivery, meal kits, and prepared foods (Hu, 2020). For the Fork It Program, coupons to the farmer's market will be provided to participating students increasing access to seasonal, locally grown fruits and vegetables from nearby farms. These coupons will be free produce vouchers with price differences in profit margins for farmers subsidized by the Fork It program.

There will be a satellite market held every Thursday afternoon on UPike's campus for produce. This arrangement has been made with the local farmer's market to increase the likelihood of student participation with closer proximity to the market which could have been a barrier previously with the farmer's market being more than 2 miles outside of campus and not all students having reliable transportation. Thursday afternoons also allow a chance for students to stock up before cooking on the weekends as compared to the current farmer's market availability of early Saturday mornings. This satellite market additionally helps in avoiding conflicts with the Saturday market activity of growers.

Through the coupons and satellite market, students will have increased accessibility to fruits and vegetables, thus changing their food environment. This encourages more meal preparation and cooking at home using the produce available. Meal preparation and cooking at home have been found to improve adherence to dietary guidelines, thus increasing fruit and vegetable intakes (Hu, 2020). Additionally, having greater control of ingredients from meal preparation and cooking has been associated with overall better diet quality and lower likelihood of obesity (Hu, 2020). In combination with the recipes provided

through the app, students will have the necessary resources and increased capacity to make changes to their diet. One recent study concluded that in order to reduce food insecurity, they recommend improving the food environment by providing a way to learn how to create meals with a variety of produce available from affordable farmers' markets (Ziso, 2022).

Community Advisory Group

A Community Advisory Group (CAG) will be formed to provide a group of people who can inform the project with meaningful community information to ensure research approaches respect and value differences in the target population. They serve as a community voice. The expectations of the CAG will be to attend regular meetings and provide meaningful insight using their expertise and experience. Meetings during the initial planning process will be monthly and move to quarterly meetings once implementation begins. The selection for CAG members is vital to ensure to success of the program and should include a diverse representation of decision makers.

For Fork It's CAG, there will be 8 critical members. Extension agent Suzanne Stumbo from Pike County's Extension office will be involved for her expertise in agriculture. Other members of the CAG will include the food service director, a registered dietician, a member of the Center for Student Success, a member from the Office of Diversity, an SGA representative, and a farmer's market representative. The food service director will offer insights on the current food environment at UPike and where promotion efforts would be best targeted in dining spaces. The dietician will have a continuously updated perspective on how student diets are evolving and ensure all efforts, such as promotion, are medically accurate. Members from the Center for Student Success and Office of Diversity provide different perspectives of the student voices this program will serve. The SGA representative also provides student insights as well as an outlook on how the program processes are going since they will be directly involved. The farmer's market representative provides a process perspective as well as a voice for the outside partners of the local farms. Finally, CAG members will be compensated for their time and expertise with the option to donate their compensation if desired.

The first 4 months of this program will be used for initial planning and forming necessary partnerships. The primary focus will be on forming the relationship between Extension and UPike as they sponsor the local farmer's market thus providing a bridge and connection for this component. During this time, Fork Its technology team will work on app creation and troubleshooting the various features of the app.

After partnership formation and app development, program materials and student engagement will need to be worked through. Due to the intensity of program activities with daily tips and weekly features program staff will start compiling daily tips and weekly recipes for the complete school year before starting implementation. Additionally, during the initial planning students will be asked to contribute recipes through campuswide surveys distributed via QR codes placed in dining space locations, common spaces, and other areas frequented by students. The dietician will then modify these recipes to be consistent with what is available with US groceries and meet dietary guidelines. These recipes will be incorporated and added to the materials compiled by program staff. This will allow for the opportunity of diverse, inclusive recipes to be included into the app.

A key factor in the success of this program will be regular student engagement with the app. This means that considerable focus and planning will go into ensuring popularity of the app. Focus groups will be created to help inform promotional strategies. The focus groups will include students of each setting (freshman, students living on-campus, and students living off-campus) as well as a board of people selected by the Office of Diversity. Different student backgrounds will allow for unforeseen challenges and considerations for food environments to be considered. The initial focus groups will consist of 3 different sessions that span across one week and last approximately 1 hour. They will be asked questions on what would encourage them to use the app, how they would be most likely to suggest the app to friends, how they often hear about apps, etc. They will be presented with ideas/suggestions to discuss and compare (ie., "which of these reward systems or incentives would make you want to participate?" rather

than "what would make you participate?") to help structure the focus group and depend less on students creating the ideas. A structured focus group allows for a more efficient use of time and higher quality information on the questions the facilitator is asking because there is less deviation from student created ideas and less bias. The initial focus groups and survey distribution will be done annually with the start of each school year to allow for updated information that is relevant to the current student body. Additional focus groups will also be done in November and February of each academic year to inform what promotional strategies are working and which need adjustment as formative research. Overall, the utilization of focus groups allows for more culturally appropriate and inclusive materials and will help better inform the recruitment process.

Once the initial planning phase is complete, recruitment will begin in month 4 of the program which will align with the start of the fall semester occurring in late August. This provides a great opportunity to reach students with school start up activities and is a natural time to start new habits/practices. Recruitment activities will take into consideration what was learned from focus groups. Additionally, there will be a heavy focus on app advertisement and recommendations to engage students to download the app. A previous study on motivations for app adoption in a college population revealed that the three main criteria for navigating app selection were recommendations, features and usability, and popularity and name recognition (Eikey, Booth, Chen, & Zheng, 2018).

Recommendations will be done through university social media outlets as well as by campus recreation employees. For first semester freshman, orientation leaders will also recommend the app as part of their activities. Advertisement will also be done via social media outlets in addition to being promoted online along with the dining packages. There will also be flyers hung around campus advertising this free program, with specific emphasis in dining location areas. Advertising will focus on the various features and benefits of the app as this was a main motivator for app adoption. Specific emphasis on the personalized feedback and farmer's market coupons will also help tailor the appeal factor. Previous research highlighted the value of feedback systems as well as "rewards" as motivational

factors for health app usage (Saklofske, 2011; Krebs & Duncan, 2015). Additionally, aligning with Pope's study protocol, in-person recruitment presentations will be conducted by on campus health services providers (Pope, Barr-Anderson, Lewis, Pereira, & Gao, 2019). This will address both the advertising and trusted recommendation components of motivational factors for app adoption. Finally, popularity and name recognition will be achieved through the partnership of MyFitnessPal for app development as MyFitnessPal is often the primary choice for college students participating in health apps (Eikey, Booth, Chen, & Zheng, 2018).

Part of the recruitment and retention process will involve offering incentives to participate. If students download the app and create an account, they will be emailed a $5 gift card that can be used at the farmer's market. Additionally, the top 3 users with the most engagement points will each receive a $100 gift card. Everyone who completes the pre/and post survey as part of the evaluation process receives an additional $5 gift card to the farmer's market. Finally, SGA will be facilitating various competitions between student groups, dorm floors, and student years to help encourage regular participation. These competitions will vary but examples would be a drawing from all students who completed a full month of diet tracking, drawings for random weeks of the meal competitions from students who submitted an entry, and drawings from who redeemed their produce coupons at the farmer's market for the previous week. Competitions will be done on a monthly basis each with a $25 gift card reward. Gift card promotion will be included as part of all advertising and promotion of the app.

Recruitment activities will follow the same general strategy for the three settings with some tailoring for increased engagement. For instance, recommendations during orientation will help target freshmen. Advertisements on the dining package website will help target all on campus students as they are required to get a dining package. Social media efforts will help to target off-campus students who may not have as much exposure to in-person presentations or physical flyers. A focus on recruitment activities will repeat at the beginning of each fall and spring semester to account for students cycling through and continuous new engagement with the app. As mentioned previously, focus groups on app engagement

will also be conducted annually to help better adapt recruitment plans accordingly with the current student body.

After recruitment, implementation of program components can begin in month 4. Activities for this program include daily reminders/tips, weekly personalized feedback, weekly competitions, weekly recipe features, and weekly coupon distribution, all through the Fork It app. Daily reminders will be automated through the app with reminders to input meals after certain time points. The daily tips will also be automated to send out each day through the app using the compiled list created during initial planning. Once school is started, SGA officers will work to continue adding to this list so there is a constant supply of new healthy eating tips. Weekly personalized feedback will be done through the app's analytic features but will be cross referenced with the program's registered dieticians to ensure that suggestions align with student's personal diet such as dietary preferences or food allergies. The registered dieticians will also be responsible for sending out the weekly recipe features to ensure that quality nutrition is incorporated with each recipe.

Weekly farmer's market coupon distribution will be managed by the project director. The coupons will be sent out through the app each Monday with a one-week expiration and one use per coupon stipulation for students. This will encourage regular participation from students to get the most out of their coupons. Students will need to "clip" the coupons in the app in order to use them. They will be able to redeem their coupons at the satellite farmer's market facilitated by this program and held on campus each Thursday from 4-7pm. Several larger vendors have agreed to come to the campus market consistently and it is anticipated that several smaller growers will take advantage of this additional market opportunity as well. The farmer's have also agreed to accept the UPike coupons which will be redeemable for cash from the Fork It program within 2 weeks of submission for reimbursement. This will be coordinated through working with Extension and other farmer's market leadership to develop a system to simplify and speed up reimbursements.

Given the different living circumstances for students at UPike, this program will be implemented as three separate settings: freshman, on-campus students, and off-campus students. Freshman may have less experience with living independently, including less cooking. Additionally, freshman and on-campus students have limitations in their cooking environments at the dorm with dorms only having a kitchenette (refrigerator and microwave) available (University of Pikeville, 2023). Off-campus students have more liberty in their cooking environment and may have more experience living independently but could face issues with time constraints. To accommodate for these differences, the weekly recipes will differ based on setting. For freshman students, the recipes will be more simplistic with minimal ingredients and cooking skill required as well as more focus on recipes that are either appliance free or only need a microwave as compared to oven and stovetop recipes. For on-campus students, there will also be an emphasis on recipes requiring minimal kitchen appliances. For off-campus students, recipes may include some cooking skill, but the emphasis will be on quick recipes with little preparation. All recipes will be available to students, but the featured recipe will be targeted.

Fidelity

Intervention fidelity monitoring will allow for more effective assessments on reaching target outcomes as well as inform continuous quality improvement efforts. The fidelity of Fork It will be monitored and tracked primarily through historical record keeping. App development and adaptation will be assessed through how closely the final product represents the intended end-product for the app. This will be determined through CAG meetings and qualitative feedback provided and recorded. For app features, the app will digitally store all of the data and the registered dietician will record each week what recipe was sent out with the date. For monitoring the farmer's market coupons, there will be a record of what coupons were available each week, what farms participated, and when the coupons were sent out. Outreach and marketing plans for Fork It will be monitored through record keeping on what social media posts were sent out, how many and what flyers were posted, and how many and when in-person recruitments presentations took place.

Sustainability

Beyond implementation of the Fork It Program, there are components built in to the program to ensure sustainability once funding has ended. The partnerships formed between the farms and UPike will have lasting effects as the farms financially benefitted from selling produce and the university improved student health behaviors. Partnership and collaboration between university and community have shown to provide a structure for program stability that can outlast original project commitments and serve to sustain project goals (Levy, Baldyga, & Jurkowski, 2003). This provides the opportunity for the university to either continue grant applications and sourcing funding to continue the weekly coupons as is, or to pivot going forward. A potential adjustment discussed in planning would be to continue the coupons without the university subsidies as there is still an increase in sales for farms. For the app portion of this program, throughout the program there was heavy involvement with SGA and plans were developed for SGA to continue app activities post grant funding as part of their organization.

Performance Measures and Evaluation

Program Goals

The primary measurable objectives of the Fork It Program are to increase student frequency of cooking, produce consumption, and students' healthy eating index score (HEI). Specific goals are as follows: increase meals prepared by students from baseline results, increase produce consumption to 1 1/2 cups per day for students at UPike, and increase students' HEI score to 58. Students will self-report how many meals they prepare at home during a week and the goal is to see increases from the initial survey to the post-program survey. The benchmark for fruit and vegetable consumption is based on the Healthy People 2030's goal to increase fruit consumption to 0.56 cups and vegetable consumption to 0.84 cups (U.S. Department of Health and Human Services, 2023). The average HEI score for Americans is 58 out of 100 with the age group 19-30 having a lower score of 53 (USDA, 2022). With Pike County and college students' data on fruit and vegetable consumption it can be estimated that their HEI would be on par with

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the 53 if not lower. Increasing to 58 would be a 10% increase in score as well as raise them to the average US score, though still within the "needs improvement" range of the index. These objectives will be achieved through program activities that work to change short term outcomes to increase students' cooking skill, nutrition knowledge, and awareness of healthy eating habits. These increases will be measured through comparisons in baseline and post data from validated survey measures used.

The behavior changes and outcomes from this program are expected to lead to improvements in the long term for obesity. The long-term impact intended from this program is to reduce obesity for students at University of Pikeville and subsequently improve obesity related complications such as diabetes, heart disease, and some cancers. These outcomes will not be measured through this program as they will require years of sustained behavioral changes.

Process evaluation

Process evaluation is an essential component of Fork It's program planning. It allows for examination of program activities and a way for researchers to better analyze the contextual factors of the program and how the activities and resources impacted the program and outcomes (Limbani, Goudge, & Joshi et al., 2019). Process evaluation for Fork It will ensure program activities were executed as planned. The components of this program requiring process evaluations are the app rollout and advertisement, app engagement and retention, and app activities including nutrition tracking, daily tips, weekly recipes, weekly personalized feedback, weekly meal competitions, and weekly produce coupons.

Many of the components needing process evaluation will utilize a historical record keeping approach to track app usage and features. Engagement efforts will be tracked through a Google sheet shared by the program team. Information on presentation days, where and how many flyers were hung, and social media posts by which accounts will all be recorded. To evaluate the process of app rollout, when participants download and create an account in the app one of the required questions will ask where they learned about the Fork It app. This will help in assessing what method of advertising was the most

effective (ie, presentations, flyers, social media, etc) and where greater efforts should be focused. A report will be created at the end of each academic semester with the results of the process evaluation to allow for improvements to be made and efforts to be refocused. Adjustments in the plan will be restructured during the winter break and summer months when the app is being updated and students are not in session.

Operationalizing Pope et al.'s protocol, app initiation will be measured through tracking how many downloads the Fork It app has. This will demonstrate the reach of the program and gauge interest. Intervention usage will be measured through app features such as the nutrition tracking and weekly meal competitions. Participants will receive one "usage point" for each day they enter data for nutrition tracking and "one point" for each meal competition they submit an entry for. For an average semester, this totals to roughly 128 available points (based on 16 week semester). To calculate usage, the number of points a student has will be divided by 128 and multiplied by 100%. Since recruitment is an ongoing process throughout the academic year with recruitment efforts being emphasized at the beginning of each semester, retention is harder to assess. To best account for rolling recruitment, retention will be assessed by dividing the number of participants who downloaded the app at least three months prior to the end of the academic year and dividing by the number of participants who engaged with the app in the last month of the academic year and multiplying by 100%. The objective for usage and retention is to reach 85% to align with Pope et al.'s results.

Daily tips, weekly recipes, weekly coupons, weekly competition posts, and the personalized feedback will all be stored using the Fork It app's database. To evaluate if they were sent out as planned, the data on what was scheduled to be distributed will be compared to what was actually distributed according to the database.

Finally, to gather process evaluation data on staff and partner perspectives, there will be at least one focus group annually to gather feedback related to the training, program implementation, barriers, and opportunities for additional engagement with future efforts. This focus group serves to provide discussion and more in-depth feedback on these processes that could not be obtained via a simple survey. This focus

group will consist of Fork It staff such as the dieticians and tech team, CAG members, SGA, and any other community member who feels they should contribute. It will be hosted via zoom to allow for accessibility in attendance and recorded for those who cannot attend.

Outcome evaluation

Outcome evaluation describes how well program objectives were achieved (CDC, 2014). In evaluating the outcomes of Fork It, evaluations will be needed for short term and medium term outcomes. Short term outcomes for this program requiring evaluation are increased student cooking skills, increased nutrition knowledge, and increased awareness of healthy eating habits. Medium term outcomes focus on the actual behavioral changes in the population. These include increased produce consumption, increased HEI score, and increased meal preparation at home.

Short Term Outcomes

Short term outcomes for Fork It will be evaluated through a pre/post survey instrument combining three different validated and reliable survey tools. The first is The Assessment of Cooking Skills and Food Skills, which assesses confidence in cooking skills (such as food preparation techniques) and food skills in the knowledge of preparing the meals (Mötteli & Hotzy, 2022). The Nutrition Knowledge Questionnaire will also be incorporated into the survey and contains 60 items assessing general nutrition knowledge (Jones, Lamp, Neelon, Nicholson, Schneider, Wooten Swanson, & Zidenberg-Cherr, 2015). To collect data on awareness of diet quality, a 24-hour dietary recall will be measured against a single question asking, "How healthy is your diet?" There will be five answer options: excellent, very good, good, fair, and poor. Diet quality will be assessed using the 2015 Healthy Eating Index (HEI-2015). This process for assessing diet quality has been used previously by Dr. Jessica Thomson in measuring American diets (Thomson, Landry, & Walls, 2022). Finally, there will be a few questions at the end of the survey assessing program acceptability. These questions will ask participants to rate each of the app features and satellite farmer's market using a 5-point Likert scale from (5) to

strongly disagree (1) for usefulness, relevance, usability, ability to motivate, and satisfaction. There will also be the option to leave open-ended feedback.

This survey will be distributed at the beginning of program activities each semester to gather baseline data and again at the conclusion of academic year. It will be delivered via the Fork It app to program participants. Collecting data yearly allows for more inclusion of program participants as some participants may only participate one year, may leave the university, graduate, etc. Feedback regarding acceptability and satisfaction will be utilized between each academic year to make necessary modifications to program activities to improve upon implementation. Program participants will be entered into two drawings for a $100 gift card to the farmer's market for completing the pre and post survey to promote survey completion.

Medium Term Outcomes

Medium term outcomes for Fork It will be evaluated through app data and surveys. To assess if program activities are achieving increases in produce consumption, analyses will be done on the nutrition tracking data available in the app to see if participants are recording more fruits and vegetables consumed. Frequency of home meal preparation will be assessed through a single question survey distributed monthly for time series data analysis. The question on the survey is: During the past 7 days, how many times did you or someone else in your family cook food for dinner or supper at home? The response option will be a fill in the blank box. This question was adapted from the National Health and Nutrition Examination Survey (NHANES) 2009-2010 Consumer Module (CDC, 2023). This survey will be distributed through the app as a pop-up message once a month. This question will be included because students may not always choose to track their nutrition in the app or may select items in the database that are similar to what they consume but do not accurately reflect if it was a meal prepared at home or purchased from a dining location (i.e., making tacos at home but choosing "taco bell taco" in the app since the information is already preloaded). This single, low burden question allows for better accuracy on meal preparation.

Finally, using the nutrition tracking data, HEI scores can be computed. HEI scores from participants first entry will be compared to their last entry to see trends over time. Additionally, the objective is for the average score to be 58 out of 100 by the end of the program.

Data Management

With all the data collection for Fork It, Institutional Review Board (IRB) approval will be needed to use the data for research purposes. Program participants will be informed of study purposes as well as data collection and provide consent to participate in the study. Additionally, all data collected will be protected to ensure confidentiality.

Capacity of Applicant Organization

The mission at the University of Pikeville is to lead in higher education for students in the Appalachian region while maintaining Christian values. This in turn is aimed to create intellectual, cultural, and economic opportunities for Appalachia (University of Pikeville, 2023). With nearly 3000 students, they maintain a 13:1 student to faculty ratio to promote a supportive environment conducive to learning and meeting the individual needs of students. In addition to various departments dedicated to academics, financial assistance, and other technical aspects, there are many departments committed to student success from a more personal enrichment perspective. The Center for Student Success, Student Affairs, and Resident Life and Engagement are just a few of the organizations on campus devoted to improving student lives through various resources and programs available.

The Center for Student Success (CSS) will be the applicant organization within UPike. CSS is a qualified team lead by Megan Childress who has over 8 years of experience in student success advising and is currently the assistant dean of student success (Megan Childress, n.d.). At CSS, they advise all incoming first-year students throughout the year demonstrating their experience in working with the students on a large scale. Additionally, they host programs such as Motivational Mondays, the Student Success Learning Lab, and What's Up Wednesday which are all solutions to improving student success

through developing skills and fostering engagement (UPike, 2023). With What's Up Wednesday they collaborate with the Office of Student Activities showing their ability to engage with different organizations to implement a similar program that fosters social engagement through home-cooked meals (UPike, 2023).

Lastly, in accordance with their policy, the University of Pikeville does not discriminate on the basis of race, ethnicity, color, sex, gender, gender identity, sexual orientation, religion, national origin, age or disabilities in its programs, activities, hiring, or the admission of students. Respecting a variety of expressions upholds their commitment to Christian principles in recognizing the worth of each person.

Partnerships and Collaboration

The Fork It program will depend on the success of partnership formation and collaboration with various organizations in the community. The primary partnership will be with the Student Government Association (SGA) to implement this program. Housed within the Office of Student Services, SGA works with faculty and administration to serve as a voice for the student body to make improvements and strengthen University of Pikeville. SGA sponsors many of the activities on campus and serve on several committees with Administration. SGA can help with approvals needed within the university for things such as flyer distribution and hosting presentations. Additionally, partnerships with other organizations and groups present on campus will be crucial for informing the program and engaging various groups of students. The Office of Diversity will be engaged both with helping to secure students for focus groups as well as being represented in the Community Advisory Group. Ensuring diverse voices are included in program planning will help avoid disparities in program delivery. Other organizations that will be involved are Resident Life and Engagement and Student Affairs. These organizations will help in disseminating the program as they have a vested interest in providing resources to students to ensure success.

Outside of the university, a partnership with Extension is crucial. Extension provides an off-campus network of local farmers and practical resources for the community. Their expertise and existing network provide a bridge to connecting local farms to the satellite farmer's market on campus. A partnership with Extension will allow the Fork It program to go beyond the outcomes of just students through creating a mutually beneficial working relationship with the local farms that increases their produce sales. Through supporting the farmer's sales with coupons and introducing a new audience to the market that will hopefully continue post project, partnerships with the farmer's market vendors are also developed and strengthened. This relationship helps to support the local economy and can assist to provide justification for sustaining the program after the end date.

The project manager will be responsible for organizing the CAG. As mentioned previously, Fork It's CAG will consist of 7 members- Extension agent Suzanne Stumbo from Pike County's Extension office, the food service director, a registered dietician, a member of the Center for Student Success, a member from the Office of Diversity, and SGA student representative, and a farmer's market representative. Each of these members provides expertise in their field that has value for this program. They ensure that community needs are met as they have experience in offering programs as well as working with this target population.

Fork It will execute all program activities and responsibilities but will lean heavily on community partners for dissemination and collaboration. Hired staff for Fork It will be responsible for creating app features and recruitment efforts. The partners mentioned previously will help in spreading the word and informing program activities but their role in dissemination is not required, but rather extremely beneficial. SGA's role will primarily be to provide permissions for program activities and maintaining certain app features. Extension will play a critical role and have the responsibility of communicating with local farms on a regular basis. To avoid adding burden with this partnership, Fork It will streamline the process as much as possible by creating the coupons using the information gathered from Extension.

Finally, Fork It will be responsible for sharing evaluation reports with CAG members as they all have a vested interest in the project and the reports can serve to help their own research interests and reporting.

Project Management

The proposed program will be managed through the Fork It app database to monitor and track progress. The project director will be responsible for the overall project execution, initiating and maintaining partnerships, and reporting evaluation results to the CAG. The project coordinator will help with project oversight, organizing CAG and focus group meetings, and coordinating app promotion efforts. The registered dieticians and tech team hired will ensure the quality of program objectives. After consulting with a registered dietician (RD), it was determined the scope of this project would need five registered dieticians to review personalized feedback to crosscheck for any allergies or food preferences that may be listed by the student and ensure accuracy for recipe creation and tips (Rachel Gillespie, personal communications, 2023). This was determined as RDs can typically handle 25-30 clients per day, so for a student body of about 2700 five RDs would be needed since it is not expected that all 2700 students would participate and the workload of reviewing feedback would not be as demanding as creating nutrition plans from scratch. A temporary tech team will be hired to adapt the MyFitness app to the Fork It platform during the initial planning phase and a part time tech assistant will be hired for troubleshooting the app for the remainder of the program. Hiring personnel with expertise in the field is beneficial because they are able to produce high quality results and promote success of the program.

SGA is a primary partner and will have members create the daily tips and help promote the program. They will also help facilitate the monthly incentive competitions. This will be on a volunteer basis, however, so a part-time research developer will be hired to oversee this and fill in any shortcomings. The research developer will also be responsible for assisting the project director in data collection and analysis. This will inform process and outcome evaluations. Extension will be responsible for coordinating with local farms to secure vendors and coupon agreements while the research developer will create the coupons within the app.

App rollout and promotion will be done year-round by the project director, project coordinator, part time research developer, and consulting with workers at student health for interim presentations. Promotional strategies expected by these positions include creating and hanging flyers as well as creating digital flyers to distribute to various social media accounts run by university organizations. It will also be encouraged for all campus organization partners, but especially SGA, to share and spread the word about the program. They will be provided with the proper marketing materials and structure to promote student engagement. Additionally, as the primary partner, SGA will facilitate various competitions between student groups, dorm floors, and student years to help encourage regular participation. The health professional consultants will already be employed through UPike so that they are familiar with the student body to give the interim presentations. Many Fork It staff and partnering organizations are part of promotional efforts as app engagement is a critical component and having a multifaceted approach will provide a better chance for success. Reference Appendix E and F for a detailed list of responsibilities and experience for each team member as well as an organizational chart.

All staff and partners in Fork It will have already obtained credentials and expertise through their career before joining this project. To ensure that staff are trained and aligned with specific program needs, they will all undergo an initial training highlighting an overview of the program, program objectives, and team members role and responsibilities. While there are many elements to ensure project success, turnover is a challenge for any intervention. All staff will also undergo quarterly check ins to discuss goals and overall performance to address any shortcomings and highlight success. These meetings will allow for proper praise to be given and issues to be caught early in an effort to minimize staff turnover. Even still, turnover may occur so to allow for flexibility positions such as the dietician and SGA volunteers are comprised of multiple people which allows for additional security if someone leaves. Additionally, there are plans in place to have continuous quality improvements based on feedback collected. The project director will be responsible for identifying the necessary changes to the program based on these results and create booster trainings which will be done annually. Finally, the program

coordinator and research developer will attend the annual Healthy Campus Research Consortium Conference for years 2 and 3 of the project. This training is offered for free and is available online and provides an opportunity for health professionals to collaborate to share research and facilitate skill building related to health promotion.

Appendices

Appendix A: Budget Justification

University of Pikeville has the infrastructure and resources needed to undertake and successfully complete this project. The following budget items are critical for successful project completion. To ensure fidelity and dissemination of the program, it is crucial to have trained staff and effort dedicated towards promotion of the app; thus, the budget is heavily weighted towards personnel and promotional strategies including incentives.

A. Personnel Salaries and Wages*

Title	% FTE	Annual Salary	Salary	Fringe Requested	Health Benefits Requested	Total Requested
Project Director	100	$65,000	$65,000	$13,141	$11,448	$89,589
	100	$66,950	$66,950	$13,535	$11,791	$92,277
	100	$68,959	$68,959	$13,941	$12,145	$95,045
Project Coordinator	100	$60,000	$60,000	$12,130	$11,448	$83,578
	100	$61,800	$61,800	$12,494	$11,791	$86,085
	100	$63,654	$63,654	$12,869	$12,145	$88,668
Tech Assistant	25	$80,000	$20,000	$3,352	$2,654	$26,006
	25	$82,400	$20,600	$3,453	$2734	$26,787
	25	$84,872	$21,218	$3,556	$2,816	$27,590
Research Developer	50	$60,000	$30,000	$2,514	$2,654	$35,168
	50	$61,800	$30,900	$2,589	$2,734	$36,223
	50	$63,654	$31,827	$2,667	$2,816	$37,310
(5) Dieticians	37.5	$50,000	$18,750	$1,383	$2,654	$22,787

	37.5	$51,500	$19,313	$1,424	$2734	$23,471
	37.5	$53,045	$19,892	$1,467	$2,816	$24,175
(3)Temporary tech team (employed only during first year)	8	$120,000	$9,600	$804	$2,654	$13,058
	0	$123,600	$0	$0	$0	$0
	0	$127,308	$0	$0	$0	$0

*Salaries increase at a rate of 3% per project year

Project Director, Nicholas Meredith (100%): Nicholas has relevant experience in program implementation and working with extension, both highly valued for this project. He has received a MPH as well. This position is primarily responsible for implementation and project oversight. Additionally, Nicholas will supervise the project coordinator and maintain the budget for the project. He will be contribute 100% FTE for all three years of the program for an annual salary of $65,000, above the average salary for program managers in Kentucky.

Project Coordinator, Lucas Tomlin (100%): Lucas will contribute 100% FTE for all three years of the program. He will be responsible for day-to-day oversight of the program. Additionally, he will be heavily involved in coordinating stakeholder meetings and promotional strategies. He will have an annual salary of $60,000, competitive for Kentucky averages for this position.

Tech Assistant, Dylan Etris (25%): This position is responsible for app maintenance and troubleshooting for the duration of the project all three years. He will contribute 25% FTE for all 3 years paid on par with current technical data quality analysts salary averages.

Research Developer, Alto Dehmon (50%): Alto has experience in wellness program implementation as well as a Masters in Biostatistics. This position will require him to perform data cleaning and analysis to develop reports used for evaluation efforts and to share with stakeholders. He will also assist with project dissemination through promotional strategies. He

will contribute 50% FTE for all 3 years of the project for a competitive salary for Kentucky averages.

(5) Registered Dieticians (37.5%): This program will need five registered dieticians to fulfill program activities for the University of Pikeville student body. They will review personalized feedback based on student preferences and allergies and assist in recipe creation for the app. They will contribute 37.5% FTE at working 20 hours per week for 9 months of the year.

(3)Temporary tech team (8%/0%/0%): Funding is requested to on MyFitness Pal software engineers to integrate the MyFitness Pal app into the Fork It platform. This will include development of app features, consideration towards design and usability, and refinement of various app strategies. They will contribute 50% FTE for the first two months of the project at the current pay rate for software engineers at MyFitness Pal.

Interim health professional consultants: Health professionals that deliver a presentation will receive $50 per presentation (approximately 1 hour). With the potential of twice weekly presentations during the academic year (64 presentations), there is the opportunity to earn up to $3200 here annually.

Fringe Benefits: Fringe benefits are requested at the university rate of 20.217% for staff. Fringe benefits for staff include social security (7.65%), retirement (10%), life insurance (0.055%), ADD (0.012%), and other (2.50%). Health benefits are requested at the university rate for staff at $11,448 /year for the employee plus spouse rate. Temporary and part time employee's fringe are listed at 8.38% with health benefits of $2,654/year. Health care costs are calculated to increase by 3% annually.

B. Research Incentives

- Incentives will be used to promote app initiation and retention. Participants will have the opportunity to earn a $5 gift card for downloading the app. Additionally, the top 3 users with the most engagement points will each receive $100 gift card each project year. One student will receive a $25 gift card each month for the monthly competitions. Everyone

who completes the pre/and post survey will receive a $5 gift card. A total of 2,700 students could participate in the program each year if initiation and retention were at 100% which would cost $27,975 in incentives annually. ($5x2700)+($5x2700)+($100x3)+($25x9)=$27,975. It is requested that this funding be available, but it is not anticipated participation will reach 100%.

C. Travel

Funding is requested for travel to meetings and trainings during the program. The project director will attend the annual Project Director's Meeting in Washington, DC for all three years of the program. The cost to attend this meeting will be $1200 each year and accounts for $500 in airfare from the closest airport (Huntington Tri-State Airport), $400 for a two-night stay at a Hilton hotel, and $100 per diem. Additionally, the program coordinator and research developer will attend the annual Healthy Campus Research Consortium Conference training for years 2 and 3 of the project. This training is offered for free and is available online so no associated travel costs.

D. Equipment

- A laptop will be provided for the project director, project coordinator, tech assistant, and research developer for efficiency in project activities and also data analysis. These will cost $600 each at the beginning of the project for a total cost of $2400.

E. Supplies and Materials

- Coupon costs for the farmer's market will be calculated using the maximum possible participants of 2700 each year. 2700 students x $5 weekly coupons x 32 academic weeks= $432,000 per year

- Funds will also be allocated for snacks for the focus groups conducted in 3 sessions, 3 times per academic year. $5 snacks x 10 members per group x 3 sessions x 3 meetings per year = $450 per year

- Promotional strategies will also have associated costs with printed flyers and paid ads on social media. It costs $0.50 per color page for flyers and approximately $0.20 per click

for social media ads. Budgeting $3,500 per year to promotional strategies would allow

for 600 printed flyers and ad campaigns to run once per month with full engagement.

Budget Line Item	Year 1	Year 2	Year 3	Total
A. Personnel	$ 390,650	$361,927	$372,688	$ 1,125,265
Project Director	$89,589	$92,277	$95,045	$276,911
Project Coordinator	$83,578	$86,085	$88,668	$258,331
Tech assistant	$26,006	$26,787	$27,590	$80,383
Research Developer	$35,168	$36,223	$37,310	$108,701
(5) Registered Dieticians	$113,935	$117,355	$120,875	$352,165
Temporary tech team	$39,174	$0	$0	$39,174
Health Professional consultants	$3,200	$3,200	$3,200	$9,600
B. Research Incentives	$27,975	$27,975	$27,975	$83,925
App initiation gift cards	$13,500	$13,500	$13,500	$40,500
Survey completion gift cards	$13,500	$13,500	$13,500	$40,500
Competition gift cards	$975	$975	$975	$2,925
C. Travel	$1,200	$1,200	$1,200	$3,600
Project Director Annual Meeting	$1,200	$1,200	$1,200	$3,600

D. Equipment	$2,400	$0	$0	$2,400
Laptops	$2,400	$0	$0	$2,400
D. Supplies and Materials	$435,950	$435,950	$435,950	$1,307,850
Farmer's market coupons	$432,000	$432,000	$432,000	$1,296,000
Focus group snacks	$450	$450	$450	$1,350
Promotional strategies	$3,500	$3,500	$3,500	$10,500
Total Costs	**$858,175**	**$827,052**	**$837,813**	**$2,523,040**

Appendix B: Logic Model of Fork It Program

Inputs	Activities	Outputs	Outcomes -- Impact		
			Short	*Medium*	*Long*
• Partnership with extension • Farmer's market connections for coupons • Budget allocation for program and app • Trained staff • Resources for app & data management • Dieticians hired	• Promotion of the Fork It app to students • App-based tailored feedback on dietary behaviors • App based nutrition tracking and menu information for campus food outlets • App-based nutrition tips and reminders • App-based meal competitions • Produce coupons distributed for local farmer's market	• 85% student engaged with the Fork It app • 85% student retention with the Fork It app • X students utilizing produce coupons	Increased: • Cooking skills • Nutrition knowledge • Awareness of healthy eating habits	Increased: • Produce consumption • Healthy Eating Index score • Meals prepared by students	Decreased: • Rates of obesity

Assumptions
Farms would be interested in this project
Students want to improve eating habits

External Factors
Concrete partnerships formed between university and extension/with local farms for produce coupons

Appendix C: Preliminary Evaluation Plan

| Evaluation Question	Indicator/Performance Measure	Data Collection Method/ Source	Collection Time Points	Who will collect?
Did students initiate interest through downloading the Fork It app?	Individuals downloading the app	App data	Daily	App
Were weekly recipes using coupon ingredients sent out to students via the app?	Recipes being sent out	Historical record of recipe messages	Weekly	Trained staff in charge of recipe creation
Are rates of produce consumption improved for University of Pikeville students from baseline to the end of each academic year of the program?	Fruits and vegetables consumed	Tracking feature	First day of each implementation each academic year of program implementation and final day of each academic year	App
Has weekly meal preparation increased for University of Pikeville students from year 1 of the program to the end of year 3 of the program?	Students reporting preparing meals at home	Self-report survey	Day 1 of program implementation and final day of year 3	App

Appendix D: Gantt Chart

Task	Year 1												Year 2												Year 3											
	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
Development																																				
Recruit and hire dietician	■	■																																		
Recruit and form CAG	■	■																																		
Meet and form relationship with extension	■	■																																		
App development	■	■										■	■	■											■	■	■									
Compiling tips and recipes		■	■											■	■											■	■									
Campus wide survey distribution			■	■											■	■											■	■								
Conduct focus groups to tailor app engagment			■			■			■						■			■			■						■			■			■			
Dietician modifications to recipes				■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Implementation																																				
CAG meetings		■		■		■		■		■		■		■		■		■		■		■		■		■		■		■		■		■		■
Recruitment of students for app				■	■	■	■	■								■	■	■	■	■								■	■	■	■	■				
Daily app nutrition reminders/tips sent out				■	■	■	■	■	■	■	■					■	■	■	■	■	■	■	■					■	■	■	■	■	■	■	■	■
Weekly personalized feedback				■	■	■	■	■	■	■	■					■	■	■	■	■	■	■	■					■	■	■	■	■	■	■	■	■
Weekly meal competitions				■	■	■	■	■	■	■	■					■	■	■	■	■	■	■	■					■	■	■	■	■	■	■	■	■
Weekly recipe features				■	■	■	■	■	■	■	■					■	■	■	■	■	■	■	■					■	■	■	■	■	■	■	■	■
Weekly coupon distribution				■	■	■	■	■	■	■	■					■	■	■	■	■	■	■	■					■	■	■	■	■	■	■	■	■
Weekly satellite farmer's market				■	■	■	■	■	■	■	■					■	■	■	■	■	■	■	■					■	■	■	■	■	■	■	■	■
Monthly incentive competitions				■	■	■	■	■	■	■	■					■	■	■	■	■	■	■	■					■	■	■	■	■	■	■	■	■
Evaluation																																				
Tracking recruitment efforts				■				■								■				■								■				■				■
Baseline survey distributed				■												■												■								
Post survey distributed												■											■					■								■
Perform data analysis													■											■												■
Review evaluation data													■												■											■

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Appendix E: Project Management- Team Responsibilities and Experience

Title	Responsibilities	Experience
Project Director: Nicholas Meredith	-Oversee hiring process for project staff with CSS input -Ensure all staff receive project training -Provide direction on overall project development and execution -Initiate and maintain key partnerships -Assist in app rollout and promotion through strategies including flyer creation and distribution and social media campaign efforts -Develop, monitor, and make necessary changes to program components based on evaluation results -Oversee and manage the project budget -Report evaluation results to the CAG	-MPH from Johns Hopkins University -10 years of experience as a program manager at the Pike County Health Department -Experience as a part time extension agent for 2 years
Project Coordinator: Lucas Tomlin	-Project oversight of day-to-day activities -Organize CAG and focus group meetings -Develop and coordinate app promotion efforts -Assist in app rollout and promotion through strategies including flyer creation and distribution and social media campaign efforts -Point of contact for project partners -Oversee staff to ensure project activities are being conducted	-Previous director for UPike's Health & Wellness division of campus dining
Tech Assistant: Dylan Etris	-Monitor app fidelity -Provide technical adjustments and support for app features	-5 years of experience as a senior technical data quality analyst for My FitnessPal
Research Developer: Alto Dehmon	-Provide input to project coordinator on promotional strategies -Assist in app rollout and promotion through strategies including flyer creation and distribution and social media campaign efforts -Oversee data collection and analysis -Perform data cleaning -Create data reports -Create farmer's market coupons within the app	-MS Biostatistics with a certificate in marketing -3 years of experience as Director of Campus Wellness at the University of Kentucky
Registered dieticians: TBD	-Review personalized feedback to crosscheck for any allergies or food preferences that may be listed by the student -Create and ensure accuracy for app recipes and tips	-State licensed dietician required
Temporary tech team:	-Adapt the MyFitness app to the Fork It platform -Create all additional app features	-Substantial development and administration experience in search technology

Current software engineers from MyFitness Pal		-Prior experience with Python, SQL, and GraphQL -Understanding of best practices in database design and data architecture
Interim health professional consultants	-Deliver health presentations focused on dietary behaviors and obesity outcomes periodically at various campus locations	-Various healthcare experience within UPike
Extension agent: Suzanne Stumbo	-Connect UPike with vendors for the farmer's market -Server as liaison between vendors and UPike -Attend CAG meetings	-Certified in Microsoft Office programs -Leadership skills -Experience in grant writing -Previous work with nonprofits -Organize the return of the Pike County Farmer's market
SGA	-Assist with approvals needed within the university for marketing -Create the daily tips -Assist in app rollout and promotion through strategies including flyer creation and distribution and social media campaign efforts -Facilitate various competitions between student groups, dorm floors, and student years to help encourage regular participation.	-Serve on several committees with administration to advocate for students -Organize campus events

Appendix F: Organizational Chart
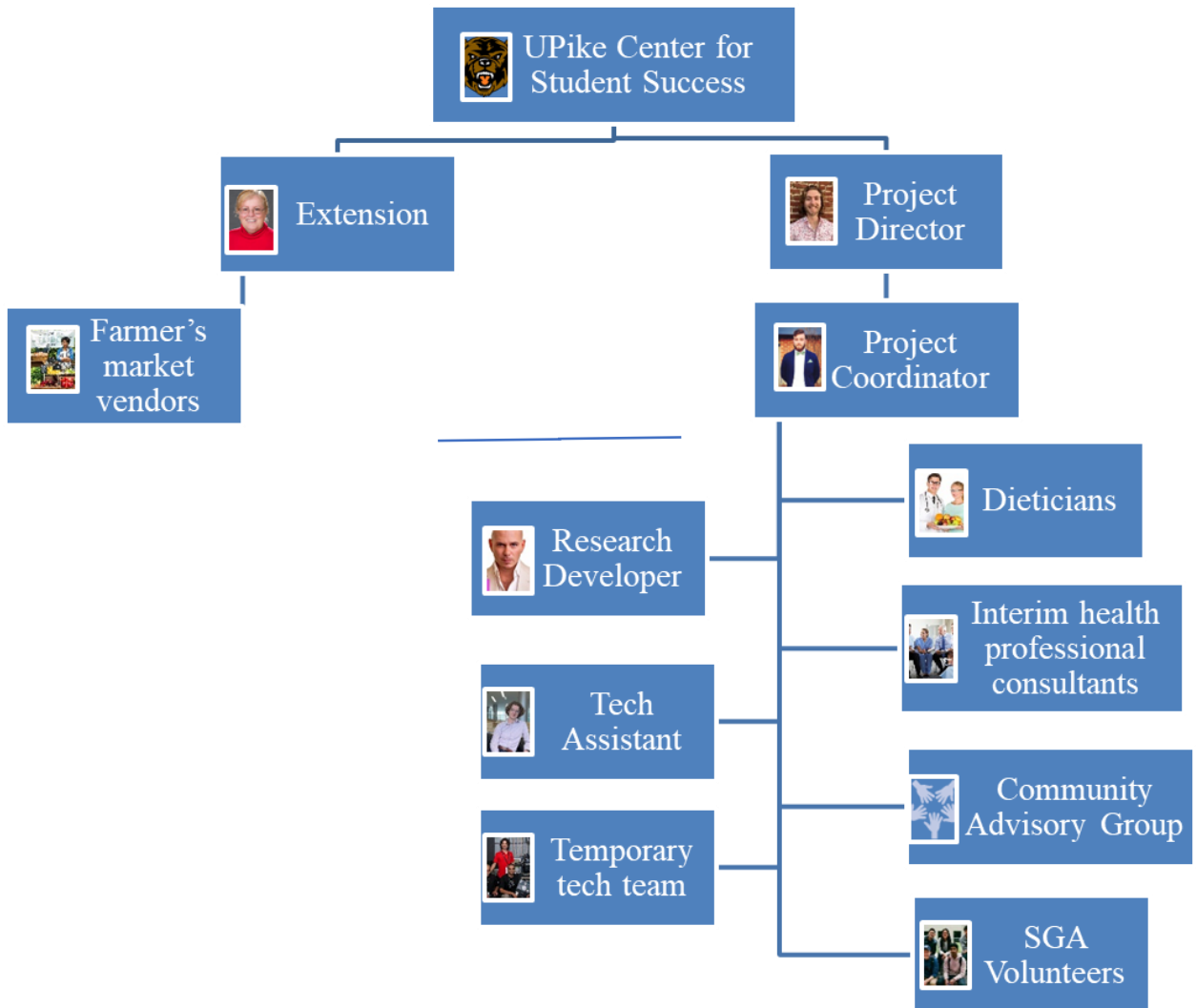
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