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EFFECTIVENESS OF GO FOR GREEN® NUTRITION PROGRAM TO IMPROVE WARFIGHTER MEAL QUALITY AND NUTRITION KNOWLEDGE

United States Army
Medical Research & Development Command

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USARIEM TECHNICAL REPORT T22-11

Effectiveness of Go for Green® Nutrition Program to Improve Warfighter Meal Quality and Nutrition Knowledge

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14. ABSTRACT: Military dining facilities (DFACs) are important avenues to fuel Service Members (SM) for optimal performance. Nutrition-based interventions can both provide and educate SM on high-performance fueling options. Go for Green® 2.0 (G4G 2.0) is a multi-component intervention in DFACs to optimize access, availability, and knowledge of nutritious food choices. The study determined the fidelity of G4G 2.0 program implementation, along with impact on DFAC diner meal quality, diner satisfaction, and plate cost. A time series, multi-site, non-controlled intervention was conducted with data collected from consenting participants at pre- and post-G4G 2.0 implementation using food photography and surveys. The G4G 2.0 program has eight requirements, including a traffic light color labeling system guiding food selection, menus offering tasty, nutrient-dense (Green-coded) foods, placement of Green-coded foods for maximum visibility, DFAC staff training, and marketing campaign. Participants freely selected food choices. Digital food photography captured diners' food selections and analyzed nutrient composition and Healthy Eating Index (HEI) scores to measure meal quality. Surveys gathered demographic, lifestyle, nutrition knowledge and diner satisfaction data. Data on food cost and program fidelity were also collected. Data were analyzed using descriptive, independent t-test, Mann-Whitney U, chi-square analyses and 2-step cluster analysis (α=0.05, 80% power). The study was approved by the Institutional Review Board. Participants were active-duty Soldiers (n=100) who provided food intake data from at least one breakfast, lunch, and dinner meal at the intervention DFAC (92% male, median age 22.0 years, 63 pre; 37 post-intervention). Meal quality (pre/post HEI scores, Median ± IQR) improved from 55.0 ± 12.8 to 64.1 ± 12.04, p<0.001. There were significant improvements in selection of whole grains, seafood and plant proteins, fewer refined grains, and improved trends for other food groups. More diners agreed that main dishes were nutritious/performance-based (32% pre; 57% post; p<0.01) and used color-coded labels to choose performance foods (38% pre; 54% post; p=0.04). The intervention resulted in an 11% increase in plate cost. The overall nutrition knowledge scores of diners and foodservice staff was below 60% post program implementation, nevertheless, a greater proportion of correct responses to nutrition knowledge questions was observed for those participants exposed to the G4G program and received at least one hour of nutrition education. Program fidelity assessment indicated successful implementation in six of eight program requirements. Results indicate that the G4G 2.0 program is feasible, efficacious, and leads to improved meal quality and satisfaction of diners. Additional strategies are needed to further enhance nutrition knowledge of both patrons and diners and find ways to improve program marketing. Future research should continue evaluating facilitators and barriers to availability, access, cost, and consumption of performance-based food options, and collect outcomes related to health and performance. Improving access to nutritious food choices that SMs enjoy supports fueling needs to support optimal performance and military readiness.

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BACKGROUND

The impact of nutritional fitness is increasingly recognized across the Department of Defense as a critical component of overall Service Member (SM) mission readiness. For example, nutritional readiness is one of the pillars of the Army's Holistic Health and Fitness (H2F) System, which is designed to address Soldier performance (ref: FM7-22). Along with H2F, there is a renewed interest and desire at all echelons to optimize the nutrition environment of our SMs. Nutritional fitness impacts mental and physical performance, military readiness, and recovery following injury. Military dining facilities (DFACs) provide an opportunity to offer and educate warfighters on how to identify and use performance-based fuel. The current Go for Green® (G4G 2.0) nutrition program was developed as an intervention to inform and motivate SMs to make more performance-focused food and beverage choices. Demonstrating that the revised G4G 2.0 is effective in improving Soldier dietary intake, and cost effective and durable, will help ensure the program receives necessary support and resources for DoD wide implementation.

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EXECUTIVE SUMMARY

Military dining facilities (DFACs) are important avenues to fuel Service Members (SM) for optimal performance, and at the same time educating them on nutrient-dense ("high performance") menu options. The Go for Green® 2.0 program (G4G 2.0) is a multi-component intervention in DFACs designed to optimize access, availability, and knowledge of high-performance food choices. The G4G 2.0 evaluation study aimed to determine the fidelity of G4G 2.0 program implementation, along with the program's impact on DFAC meal quality, diner satisfaction, nutrition knowledge and plate cost. This project employed a time series, multi-site (Fort Hood and Fort Carson), non-controlled intervention with data collected from consenting participants at pre- and post-G4G 2.0 program implementation using food photography and surveys. The study was approved by the U.S. Army Research Institute of Environmental Medicine and U.S. Army Medical Research and Materiel Command Institutional Review Boards. The G4G 2.0 program has eight requirements, including a traffic light, color-coded labeling system, menus that offer tasty and nutrient-dense (Green-coded) foods, strategic placement of Green-coded foods to maximize visibility, DFAC staff training, and a robust marketing campaign. Participants freely selected meals from food choices served at the DFAC. Digital food photography captured diners' food selections and analyzed nutrient composition and Healthy Eating Index (HEI) scores to measure meal quality. Surveys gathered demographic, lifestyle, diner satisfaction data and nutrition knowledge. Data on food cost and G4G 2.0 program fidelity were also collected. Data were analyzed using descriptive, independent t-test, Mann-Whitney U, chi-square analyses and 2-step cluster analysis (α=0.05, 80% power). Participants were active-duty Soldiers (n=100) with food intake data from at least one breakfast, lunch, and dinner meal at the intervention DFAC (92% male, median age 22.0 years, 63 pre; 37 post-intervention). HEI scores improved significantly from pre: 55.0 ± 12.8 to post: 64.1 ± 12.04, p<0.001 (Median ± IQR). Significant improvements were noted in selection of whole grains, seafood and plant proteins, fewer refined grains, and improved trends for other food groups. More diners agreed that main dishes

were nutritious/performance-based (32% pre; 57% post; $p<0.01$) and reported using color-coded labels to choose performance foods (38% pre; 54% post; $p=0.04$). The intervention resulted in an 11% increase in plate cost. The overall nutrition knowledge scores of diners was below 60% post program implementation. Nevertheless, a greater proportion of correct responses to nutrition knowledge questions was observed for those participants exposed to the G4G 2.0 program and who received at least one hour of nutrition education. Program fidelity assessment indicated successful implementation of six of the eight program requirements. The G4G 2.0 program is feasible, efficacious, and improved meal quality and satisfaction of diners. Implementing G4G 2.0 per the program requirements provides a greater amount and variety of strategically placed Green-coded (high-performance) menu items to create a more support nutrition environment. Also, G4G 2.0 program has a potential to improve performance nutrition knowledge, which could translate to overall improved nutrition-related behaviors both within and outside DFAC. Future research should identify key facilitators and barriers to providing and choosing performance-based food options, as well as consider outcomes related to health and performance, rather than just diner satisfaction. Improving opportunities for SM to fuel with nutritious and tasty food choices along with strategic nutrition education messaging are crucial for optimal nutritional fitness and military readiness.

INTRODUCTION

Reports indicate that 63.5% of Department of Defense (DoD) Service Members (SMs) are overweight and 14.4% are obese per body mass index guidelines.[1] Overweight and obesity are associated with poor physical fitness and may adversely affect mission readiness. Moreover, data from across the DoD indicate that SM intake of nutrient-dense foods is less than ideal, which may contribute to overweight and obesity. [2-4]

In a recent study, food choices of SMs in a military dining facility (DFAC) were rated as poor as evidenced by a meal quality score of 49 of 100 points on the Healthy Eating Index (HEI). [2] Of note, the average reported HEI-2015 score for Americans is 59 points.[5] Similar to the civilian setting, gaps in access and availability of nutrient-dense foods exist in the military nutrition environment, which negatively influence SM eating behaviors.[6,7] Providing adequate nutritional fueling is critical for mental and physical performance optimization as poor food choices and suboptimal meal quality may negatively impact mission readiness.

Targeted nutrition interventions in DFACs are key opportunities to improve SM knowledge and behavior.[8] Several DFAC interventions have been shown to be effective, especially when the taste and quality of menu items were improved.[9] One such intervention involving menu enhancements (increased fruits, vegetables, and whole grains; reduced fat and sugar; included at least one lean meat or vegetarian entree), staff education, marketing posters, and use of traffic light food labels at ten Army DFACs resulted in reduced intakes of energy, total fat, saturated fat, and refined grains and improved customer satisfaction.[8] Similarly, a nutrition program at two U.S. Air Force basic military trainees DFACs demonstrated that diners reduced daily fat intake from 35% to 19% of total calories, whereas those dining on

the standard fare DFAC increased their fat intake.[10]

Traffic light labels identifying menu items as Green, Yellow, and Red, when placed at the point of selection, have been suggested as a population-wide strategy to encourage better food choices.[11] This strategy is based on social cognitive theory, which focuses on the inter-relationship of diner knowledge regarding nutritious food choice, personal responsibility to make better choices to support optimal health and performance, and the influence of the social and physical environment when deciding what foods to choose.[12-14] Compared to other labeling options, traffic light labeling was shown to be more effective in educating consumers to select healthier food options.[15-18]

Interventions using food labels have had mixed results, ranging from improvement to no change in eating behaviors.[9,19,20] However, it is unclear whether awareness and/or perceived healthfulness actually translate into healthier food choices.[17] Two systematic reviews of food labeling have highlighted the 1) the inability of menu labeling with calories alone to promote healthier choices, 2) a need for more contextual or interpretive nutrition information on restaurant menus to assist consumers in selecting fewer calories, and 3) a need for well-designed studies on menu labeling in various settings.[21,22] Thus, a nutrition DFAC intervention that includes traffic light labels with choice architecture is warranted to determine effectiveness and ultimately to encourage better food choices and improve mission readiness of SM.

In 2008, Go for Green® (G4G 1.0 or original) was implemented to standardize labeling in Army DFACs and educate Soldiers to identify and choose nutritious, “high-performance” options. Initially there were three program components: 1) traffic light color labels, 2) standardized food cards, and 3) printed marketing posters (Table 1). This was based upon research suggesting

that traffic light color labels displayed on food cards influenced diners to choose more nutritious food options.[23] The program was then expanded to the other military service branches with the potential to impact SMs worldwide.

The original G4G 1.0 program underwent a major revision by incorporating feedback from DoD dietitians, foodservice operators, and other key stakeholders along with advancements in nutrition and health promotion research. Revisions addressed outdated coding criteria, lack of a standardized coding approach, lack of standardized staff training, outdated marketing and education strategies, and menus with inadequate amounts of Green-coded items.[24,25] Additionally, a larger emphasis on the connection between optimal fueling and SM performance was needed to prioritize resources and buy-in by leaders and diners for DFAC interventions, such as G4G. Across 2015, the G4G program was pilot tested by the G4G Program Office at the Consortium for Health and Military Performance (CHAMP) at the Uniformed Services University of the Health Sciences and the Army Public Health Center in conjunction with the Performance Triad pilot at several Army installations.

Based on the available data and feedback, the G4G program was substantially revised and rebranded to G4G version 2.0 (G4G 2.0) and managed by the G4G Program Office at CHAMP.[26] One of the most significant revisions was development of an algorithm to standardize assigning foods or beverages as Green, Yellow, or Red code (Figure 1). This assigned code aligns with the U.S. Dietary Guidelines for Americans, Military Dietary Reference Intakes, DoD nutrition and foodservice standards and regulations, and the latest nutrition science literature. Specific emphasis was placed on “nutritional quality” to capture the degree of processing, total sugar, quality (type) of fat, and fiber instead of only calories, percent total fat, and sodium. Additionally, sodium was designated as a separate, but complementary code (Low, Moderate, and High) based on the variable sodium needs of SMs. This program revision also supported

the Armed Forces Recipe Service's initiative to update their catalog of military recipes to increase whole grains, add more vegetables, utilize leaner meats, optimize flavors through more seasonings (less salt), and employ healthier preparation techniques (e.g., roasting vegetables, baked vs fried).

The second significant G4G 2.0 program modification was the establishment of program requirements (PRs). This included five newly added PRs to increase the availability, access, and promotion of Green-coded menu items. The G4G 2.0 PRs are: 1) standardized management training, 2) assign traffic light codes based on approved coding algorithm by trained coders, 3) menu with minimum number of Green-coded items targets, 4) standardized food cards, 5) food placement strategies, 6) promotion of Green-coded items, 7) marketing (printed materials, social media, press) and education, and 8) standardized staff training. Program resources, templates, menus and recipes, news, and support are available on the public-facing website, hosted by CHAMP: https://www.hprc-online.org/nutrition/go-green. Key programmatic elements are highlighted in Appendix A.

An opportunity arose to implement the newly revised G4G 2.0 program at Army DFACs. CHAMP requested assistance from USARIEM to assess the effectiveness of G4G 2.0. Both PubMed and Defense Technical Information Center (DTIC) searches were conducted (14 November 2016) using the keywords: "dining facility" (or "dining hall"); "military forces" (or "military"); "Health Eating Index 2010" (or "HEI 2010"); "menu planning"; "healthy eating"; and "performance". These searches indicated that this protocol would not be a duplication of previous research efforts. The purpose of this study was to test the feasibility and efficacy of improving ad libitum nutritional intake, nutrition knowledge, and diner satisfaction of Wolf DFAC, Fort Carson and Freeman Café, Fort Hood Soldiers following implementation of the revised G4G 2.0 program.

Study Objectives / Specific Aims / Research Questions

Primary Objectives:

1. Determine the effectiveness of the revised G4G 2.0 program to improve meal quality, satisfaction and nutrition knowledge of DFAC diners.
2. Determine the G4G 2.0 program feasibility through changes in average plate cost during G4G 2.0 implementation.

Secondary Objectives:

1. Assess whether the G4G 2.0 program intervention promotes changes in diners' self-reported lifestyle behaviors and attitudes towards the impact of nutrition on health and wellness factors.
2. Determine if the G4G 2.0 program intervention is associated with changes in subjective rating of appetite/satiety before and after eating in the DFAC.
3. Capture DFAC staff perspectives on barriers, challenges, and experiences related to G4G 2.0 program planning, implementation, and sustainment.

Hypotheses:

1. Implementation of the G4G 2.0 program will result in improved meal quality, meal satisfaction and nutrition knowledge of diners.
2. Average plate cost for G4G 2.0 will be feasible and comparable to a standard garrison DFAC.
3. The G4G 2.0 program intervention will promote changes in Soldiers' self-reported lifestyle behaviors and attitudes with potential future impact of nutrition on health and wellness factors.
4. The G4G 2.0 program intervention will be associated with enhanced diners subjective rating of appetite/ and satiety.

5. Understanding the DFAC staff perspectives on barriers, challenges, and experiences related to G4G 2.0 program planning, implementation, and maintenance will assist with future mitigation strategies and useful to improve program fidelity.

RESEARCH DESIGN AND METHODS

Research Design

This was a time series, multi-site, non-controlled intervention study evaluating the implementation and effectiveness of the G4G 2.0 program between May 2017 and September 2019 at two U.S. Army DFACs (in Colorado and Texas). Data were collected pre- and post-G4G 2.0 program implementation. At each time point, uniquely enrolled participants were assessed for meal quality of, and satisfaction with, three meals (minimum of one breakfast, one lunch, and one dinner). The study was approved by the U.S. Army Research Institute of Environmental Medicine and U.S. Army Medical Research and Materiel Command Institutional Review Boards.

Participant Population

Participants included diners at the Wolf DFAC (primarily Soldiers from the 4th Sustainment Brigade (4SB), 4th Engineers (4EN), 759 Military Police (MP), Division Artillery (DIVARTY), and Headquarters and Headquarters Battalion (HHBN) of the 4th Infantry Division, Fort Carson, CO) and diners at the Freeman Café DFAC (primarily Soldiers from the 1st Cavalry (1CAV), 4SB, 13th Sustainment Command (Expeditionary), DIVARTY, and HHBN 1CAV, of the III Corps, Fort Hood, TX). The plan was to recruit a total of 720 DFAC Soldiers and 250 DFAC staff: 180 Soldiers over four iterations; 50 DFAC staff over five iterations.

Inclusion and Exclusion Criteria

Participants were included if on active duty, adults (18 years and older), consuming meals for at least one month at either Wolf DFAC or Freeman Café. Participants needed to be willing to consume three meals each day for two testing days at the intervention DFAC (minimum of one breakfast, one lunch, and one dinner to attain average daily intake). If willing and available to participate, they could volunteer for subsequent data collection. No exclusion criteria were set. Participants were not monetarily compensated for study participation; however, they were offered the privilege of moving to the front of the DFAC line on study days to allow maximum time for meal consumption and tray photography.

Sample Size Estimations

SPSS SamplePower 3.0.1[41] was used to estimate sample size based upon the anticipated change in HEI-score as the primary outcome by using an independent t-test analysis (different participants per group); power was set at 80% and alpha 0.05 (two-tailed analysis). A mean change in HEI-2015 was expected at 5-6 points pre- to post-implementation with a 10-point variance. This estimate was based on a Kirkpatrick et al.[27] report noting that HEI standard deviations of approximately 11-12 points for adults would equate to a moderate effect size of 0.5. To detect that magnitude of HEI change required a minimum of 17 participants per time point at each location. Based upon results from USARIEM protocol #15-04-HC[2] (same methodology), a 30-50% increase in sample size would be needed to account for attrition and participant non-compliance (not attending three of six meals. Therefore, a sample size of n=180 per iteration for a total n=540 over three iterations was considered sufficient.

Sample size estimate for change in nutrition knowledge before and after implementation

assessment required 16 per group (pre vs. post) considering a 10-point difference in knowledge scores, a 10-point standard deviation, at 80% power and an alpha set at 0.05 (two-tailed analysis). Thus, the sample size (n=180) required for the HEI-score dietary quality assessment was sufficient to complete the nutrition knowledge assessment as well.

Stratified, purposeful sampling was conducted to obtain feedback from Wolf DFAC and Freeman Café staff in both supervisory and non-supervisory roles. Published studies using focus groups for health-related outcomes range in sample size of 10-60 participants.[28-31] Research supports a minimum of 15 participants to represent each group (in this case supervisory and non-supervisory staff role).[32] USARIEM protocol #15-04-HC enrolled 7-10 DFAC supervisors and 26-33 non-supervisory DFAC staff at each data collection iteration and reached thematic saturation (no new themes identified during final focus group of each iteration). The researchers therefore requested up to 50 DFAC staff members (combination of supervisory/non-supervisory) from Wolf DFAC and Freeman Café to once again increase likelihood of thematic saturation (maximum sample size of n=50 at focus groups held at pre, mid, and post-G4G 2.0 implementation at Wolf DFAC; pre- and post-G4G 2.0 implementation at Freeman Café; total of n=250 for the study).

A total sample of n=790 was requested to account for both the DFAC diner assessment (n=540) and DFAC staff member focus groups (n=250).

Research Methods

The G4G Program Office at CHAMP served as consultants for G4G 2.0 program implementation along with local DFAC teams and USARIEM along with Pennington Biomedical Research Center (PBRC) staff were responsible for G4G 2.0 program evaluation. The USARIEM research team planned to travel to Fort Carson for three

iterations and Fort Hood at two iterations as noted in Figure 2: pre at 0-month (T-0), mid-launch (T-1), and post-G4G 2.0 intervention (T-2). Noted below are the participant populations (DFAC diners or staff), number of participants, measures and timing of data collection, and the intent for each iteration.

Participants

The plan was to recruit up to 180 DFAC diners at pre- and post-iterations for each site, consent, ask to complete four surveys (lifestyle behaviors, nutrition knowledge, G4G awareness and customer satisfaction), and participate in digital food photography nutrient intake assessments. In addition, we also planned to recruit and consent up to 50 DFAC staff members for five iterations (three at Fort Carson and two at Fort Hood) to complete three surveys (nutrition knowledge and G4G awareness).

Time Point Description

T-0 – Pre-G4G 2.0 Intervention (baseline): This iteration examined DFAC diner and staff outcome measures (noted above) prior to G4G program implementation.

T-1 – Mid (Fort Carson only): This iteration captured staff experiences, challenges, and suggestions to improve G4G 2.0 implementation thus far and to provide leadership with additional insights from the DFAC staff perspective.

T-2 - Post-G4G 2.0 intervention: This iteration examined DFAC diner and staff outcome measures after full G4G 2.0 program implementation.

Go for Green® (G4G) 2.0 Program Intervention

The G4G Program Office at CHAMP worked with Wolf DFAC, Fort Carson and Freeman Café, Fort Hood DFAC staff and supervisors to execute G4G 2.0 planning, implementation, and

sustainment. During the study, the G4G Program Office at CHAMP conducted in-person management training (PR1), assigned color and sodium codes to a 21-day menu with 12 specialty bar options (PR2) to meet G4G 2.0 menu targets (PR3), and printed materials and other marketing strategies (PR7). The team conducted site visits for hands-on assistance, staff training, and course correction and was engaged with the local DFAC team, Registered Dietitian and nutrition assets, and leadership via email and teleconferences.

Research in the emerging field of nutrition implementation science highlights the need to maximize program quality and impact to ensure interventions are effective, achievable, and efficient in practice. To do so, evaluation tools are necessary to provide objective assessment of program compliance to established standards or benchmarks. In the 10-year history of the G4G program, a standardized, comprehensive evaluation instrument with benchmarks has not been used. The G4G Program Office at CHAMP, in collaboration with the Army Public Health Center, developed the first version of the G4G 2.0 PFA tool. The PFA tool evaluates the degree to which DFACs have implemented the eight established PRs.

The validity and reliability of this tool was established during the current G4G 2.0 evaluation effort. During this time, G4G Program Office at CHAMP team tested and refined the PFA tool. First, the team identified actionable tasks to evaluate whether the facility successfully implemented each PR. Examples of PR tasks include: percentage of Green-coded menu items by review of the facility's menu, the number of choice architecture strategies to promote Green-coded options, use of various marketing strategies to market the DFAC and menu, and percentage of DFAC staff trained. Multiple onsite visits by the G4G Program Office at CHAMP team led to iterative revisions that refined the tool for a more accurate assessment of adherence to the desired benchmarks. In particular, the review of serving a nutritious menu (PR 3),

program and facility marketing (PR 7), and DFAC staff training (PR 8) were expanded to better capture tasks critical to implementation efforts.

Lastly, a scoring system was developed to objectively assess PR fidelity with a set benchmark of 75-100%. Consideration was given to establishing a realistic benchmark but allowing room to surpass minimum standards to motivate staff and DFACs to achieve excellence. A 75% benchmark was set for most PRs: menu targets, standardized food cards, food placement strategies, promotion of Green-coded items, and marketing and education. Benchmarks for DFAC facility management training and assigning traffic light codes for menu items were set at 100% because they are essential to program integrity and success. Despite its criticality to program and staff engagement, staff training was set at 80% due to high staff turnover inherent to operating DFACs. Overall, the PFA consisted of 15 scored sections covering the eight PRs for an objective assessment of program compliance. The G4G 2.0 program was considered fully implemented if the DFAC met benchmark standards for all eight PRs. This project evaluated G4G 2.0 program implementation at two Army DFACs to assess the impact of this performance nutrition intervention.

Digital Photography and Diet Quality

Digital photography, a field expedient food photography method that accurately captures food selected and consumed by diners, was used to quantify food selection and intake of study participants (Figure 3). Researchers added the DFAC's recipes to the USDA Food and Nutrient Database for Dietary Studies (FNDDS).[33] Total nutrient intake was defined as the difference between estimations of food amounts in pre- and post-meal photographs reviewed by trained visual estimators. Final nutrient intake estimates were averaged and analyzed using the FNDDS system. Specific participant nutrient intake information was generated. Studies with adults have demonstrated this methodology to be highly reliable and valid.[34,35]

The dietary intake measures included, but were not limited to total calories, fatty acids, carbohydrate, protein, fiber, vitamins, and minerals. The Food Pattern Equivalents Database generated food serving information necessary for assessing food pattern components to calculate the HEI.[36,37] The HEI-2015 is a measure of diet quality as relative adherence to the 2015-2020 Dietary Guidelines for Americans (DGA).[38] The HEI-2015 score is comprised of 13 food components with a maximum of 5-10 points per component with 100 points as the highest potential score. Adequacy of food component scores increase as nutrient intake aligns with federal recommendations, while the moderation component scores increase with lower intake of nutrients to limit (refined grains, saturated fats, added sugars, and sodium).

HEI-2015 can be used to describe adherence to the DGA: overall scores of 90 to 100, or component scores that are 90% to 100% of maximum score: A; overall scores of 80 to 89, or component scores that are 80% to 89% of maximum score: B; overall scores of 70 to 79, or component scores that are 70% to 79% of maximum score: C; overall scores of 60 to 69, or component scores that are 60% to 69% of maximum score: D; and overall scores of 0 to 59, or component scores that are 0% to 59% of maximum score: F. The U.S. National HEI score average over the past ten years has ranged from 48-57 points.[39,40] Previously, Basiotis et al.[41,42] described diets according to the following: HEI scores > 80 indicate a “good” diet, scores ranging from 51 to 80 reflect a diet that “needs improvement,” and HEI scores < 51 imply a “poor” diet. Adequacy of food component scores increase as nutrient intake aligns with federal recommendations, while the moderation component scores increase with lower intake of nutrients to limit (refined grains, saturated fats, added sugars, and sodium). The HEI-2015 total and component scores of participants were assessed as a daily average of three meals (breakfast, lunch, and dinner; examples shown and reported as median ± interquartile score range (IQR).

Paper-Based Surveys

1) Demographics & Lifestyle Survey (Appendix B)

Participant demographic data and lifestyle information was collected in-person via paper survey. Demographic data included: age, height and weight, ethnic and racial background, highest education level, and military rank. Twenty-eight lifestyle questions were included relating food choice to meal timing and location, lifestyle habits and perceptions regarding physical activity, sleep, energy level, and performance. The survey was successfully used for Protocol #15-04-HC and enables future comparison between DFAC studies.[2]

2) Dining Facility Satisfaction (Appendix C)

The diner satisfaction survey examined sensory qualities of food provided and consumed in the DFAC (taste, texture, temperature, and appearance), availability, thoughts on quality and health impact, and usefulness of labels to promote selection of high-performance foods. The survey consisted of 17 items on a 7-point Likert Scale ranging from “Strongly Agree" to “Strongly Disagree”. The survey was successfully used for Protocol #15-04-HC and enables future comparison between DFAC studies.[2]

3) Nutrition Knowledge (Appendix D)

Data collected examined a combination of general and performance-based nutrition knowledge (NK) of diners and DFAC staff. This diner NK survey was created as a subscale to a Military-Specific Eating Behavior Survey (Protocol #16-12-HC)[43] and tailored for this protocol using 40 true/false questions. Of the survey, 18 items were validated as part of the Military-Specific Eating Behavior Survey and consisted of general and performance nutrition questions. The NK questionnaire consisted of true/false questions on performance nutrition - macronutrients, micronutrients, energy, dietary supplements, and hydration and confidence in the response

(yes/no). Nutrition knowledge was compared between diners who were and were not exposed to G4G 2.0 program and those with and without any prior nutrition education. The survey served two purposes: 1) identify the key gaps in nutrition knowledge; and 2) assess if changes in nutrition knowledge impact food choice (used in conjunction with food photography) regardless of the G4G 2.0 program. The DFAC staff at two DFACs completed questionnaires pre- and/or post-G4G 2.0 program implementation on NK and the G4G 2.0 program information. A demographic survey was added after the first study location pre-data collection with a resultant smaller sample size.

4) G4G Awareness for Diner (Appendix E) and Staff (Appendix F)

Specific surveys were created in conjunction with the G4G 2.0 Program Office at CHAMP consultants. The diner survey examined the effectiveness of the G4G 2.0 marketing campaign as well as beliefs and attitudes towards the usefulness of G4G 2.0. The diner survey consisted of 29 items that were a combination of multiple-choice, 5-point rating scales and yes/no questions. The staff survey examined the effectiveness of the G4G 2.0 staff training as well as beliefs and attitudes towards the new program and barriers to G4G 2.0 implementation. This staff survey consisted of 32 items that are a combination of problem solving, multiple-choice, 5-point rating scales and open answer questions. These documents will be incorporated as future program evaluation tools.

5) G4G Staff Demographics (Appendix G)

Participant demographic data information was captured by self-report and included: self-reported sex, age, height, weight, rank, ethnicity, racial background, education, Military Occupational Skill (MOS), and years in the military.

Satiety Labeled Intensity Magnitude (SLIM) Scale (Appendix H)

Research suggests the level of hunger influences the types of food selected.[44-46] The investigators were interested in understanding the relationship between hunger levels pre- and post-meal and the impact on food choice quality and quantity. Results from the USARIEM protocol #15-04-HC explained 54% of the variance in magnitude of satiation (SLIM score change) was due to the initial degree of hunger, protein and carbohydrate intake, whole grain intake, meal length and having enough time to eat.[2]

Hunger and satiety were assessed pre- and post-meal consumption at the time of tray photography. Each participant was asked by a research staff member to view the SLIM scale and identify the level of hunger or satiety that was the closest representation to their current state. The SLIM scale is an 11-item diagram drawn on a 10-cm line with descriptive labels ranging in self-perceived hunger/fullness ranking from greatest imaginable hunger to greatest imaginable fullness. Scoring ranges from -100 points (greatest level of hunger) to +100 points (greatest level of fullness). The change in SLIM scores is calculated as the difference between the pre- and post-SLIM scores (total of 200 points). The SLIM scale was shown to be a sensitive, reliable, and easy-to-use scale for measuring perceived satiety.[47] Perceived satiety was compared to HEI-2015 scores and specific nutrient intake.

Pre-meal SLIM scale also included questions on previous mealtime and snack choice because prior snacks may impact food choices and rate of eating (Appendix H 1). Post-meal SLIM scale asked two questions related to the rate of eating (Appendix H 2). Three additional questions (dependent on time availability) were asked at post-meal photography: (1) “How satisfied are you with your meal selection today?”, (2) “If you could recommend one change in the DFAC, what would it be?”, and (3) If a significant amount of plate waste was noted, “What is the reason for leftover food on your plate?” Responses to these

questions were digitally recorded along with the meal tray. This provided additional insight into diner satisfaction immediately following meal consumption. The SLIM data are analyzed separately and will not be presented in this report.

Plate Cost

Military DFACs receive funds allocated to feed each diner per day (called a "basic daily food allowance") from which to plan and execute meals.[48] Concerns exist regarding potential increased cost of performance-focused menu modifications due to the addition of fresh produce, seafood, and whole grains, as well as conversion to more scratch-made vs ready-to-serve options. Average plate cost of the G4G 2.0 compliant menu used was determined from the total cost of food prepared divided by the number of diners fed.

Focus groups (FG) conducted with DFAC staff and FG data are analyzed separately and will not be presented in this Technical Report.

Statistical Analysis

SPSS version 26[49] was used for statistical analyses. Demographic descriptive data between baseline and post-test were examined using Mann Whitney U or Chi-square analyses as location and time points varied in sample size and enrolled different participants at each time point. A two-step cluster analysis examined HEI scores (pre-intervention and change pre-to-post), by location (Fort Carson vs. Fort Hood), sex, education, and rank variables, to determine cluster effects of non-normal distribution and unequal sample sizes at the two locations. Demographic descriptive data are reported as median and IQR or frequency and percent based on the scale of measurement. Mann-Whitney U analysis compared total HEI-2015 and HEI

component scores between pre- and post-G4G 2.0 implementation stratified by meal and location with data reported as median and IQR. Differences in Green-, Yellow-, or Red-coded foods consumed at each meal were compared by Chi-square analysis. Results are combined between two study locations due to attrition and inadequate numbers of subjects to assess differences by installation. The fidelity of G4G 2.0 implementation was measured by adherence to the G4G 2.0 program requirements benchmarks. The total cost of food prepared divided by the number of diners fed determined the average plate cost of the G4G 2.0 menu used in this study. Nutrition knowledge assessment consisted of analysis on the subjects' percentage of correct responses and the NK responses were re-categorized into four response outcomes: confident and correct, confident but incorrect, unconfident and correct, or unconfident and incorrect. Recategorized values were summed for a total NK score ranging from 1-54 points. The NK data were analyzed for descriptive statistics and are reported as mean ± standard deviation (SD) or frequency (%). Wilcoxin rank sum test was used to compare total NK score and each NK question between staff with or without G4G training. Response percentages were reported as either confidently correct or confidently incorrect.

RESULTS

Subject Demographics

Of the 282 total enrolled participants, 100 participants consumed at least one breakfast, lunch, and dinner meal (n=63 pre- and n=37 post-G4G 2.0 implementation) to meet criteria for data analysis inclusion. The majority (92%) of participants were male and young (median±IQR: 22±4.0 years). Demographic data depicted that the majority were junior ranking personnel, had a healthy Body Mass Index, were physically active, and had physical readiness ratings of "good" to "best shape" (Table 2). The only significant difference was a greater proportion of senior

enlisted personnel participated during post-G4G 2.0 implementation compared to pre-G4G 2.0 (14% vs. 2%; p=0.02).

G4G 2.0 Program Fidelity

The implementation process resulted in the development and refinement of content and benchmarks to objectively assess program fidelity by using the first G4G Program Fidelity Assessment (PFA) tool (Appendix I). Assessment of G4G 2.0 program fidelity identified the extent of adherence to eight program requirements (Table 3.). After a phased implementation, Wolf DFAC successfully met the benchmarks for 8 of 15 PFA scored sections. The PFA was conducted at the Freeman Café G4G 2.0 grand opening and again three months later. Although the time between the PFAs was short, the initial (grand opening) PFA followed a period of close support and guidance from the G4G Program Office at CHAMP. Per the initial PFA, the DFAC successfully met the benchmarks for 12 of 15 scored sections. The second PFA indicated the DFAC met benchmarks in 10 of 15 scored sections.

Overall, the DFACs were successful in meeting the following PR benchmarks after G4G 2.0 implementation: standardized management training, assignment of traffic light codes, menu targets with a minimum of Green-coded items, standardized food cards, food placement strategies, and staff training. Specifically, the updated G4G 2.0 DFAC menus increased availability of high-performance choices. Prior to G4G 2.0, the DFAC menu was 5% Green (breakfast) and 43% Green (lunch/dinner) compared to post-G4G 2.0 implementation, which transitioned to 41% Green (breakfast) and 61% Green (lunch/dinner). Adherence was below benchmarks for requirements related to marketing of the overall G4G 2.0 program and certain strategies to promote Green-coded items. Overall, G4G 2.0 was implemented such that the evaluation of program effectiveness is valid and relevant. Extent of program adherence at the two study sites are highlighted in Table 3.

Meal Quality

Improved menus translated into higher availability of high-performance foods and more opportunity for diners to select them. This critical component of the G4G 2.0 intervention resulted in a significant improvement of overall meal quality with HEI-2015 scores increasing from 55.0±12.8 at baseline to 64.1±12.0 post-G4G 2.0 implementation (p<0.001). Although sample size at each location was not large enough to warrant comparative analysis between locations, cluster analysis identified that Fort Carson was most predictive of the change in HEI score (1.00; 100% Fort Carson contributing to pre-HEI score at 55.5 vs post-HEI score at 64.1 points) followed by pre-post intervention (0.82; 70% of Fort Carson had a pre-HEI at 58.5 points). Figure 4 illustrates the median changes in 13 HEI component scores from baseline to post-G4G 2.0 implementation. Whole grains (+3.0 points, p<0.001) and seafood and plant proteins (+3.5 points, p<0.01) increased significantly whereas intake of refined grains decreased (1.49 points, p<0.001). Some examples of meals with high and low HEI-15 scores are shown in Figure 5. After G4G 2.0 implementation, significantly more Green-coded (+8%, p<0.05) and fewer Red-coded (-7%, p<0.05) options were selected overall (Figure 6). More Green options were selected for lunch (+8%, p<0.05) and dinner (+13%, p<0.05) and Red item selections decreased (-10%, p<0.05). At breakfast, a significant decrease in Red-coded items was noted (-5%, p<0.05), although no change in choice of Green-coded items was observed (27% Green-coded items selected).

Diner Satisfaction

Significantly more diners agreed that the main dishes served were healthy and performance-based and appreciated the availability of vegetarian food choices post-G4G 2.0 implementation (Table 4). Diners reported that food labeling enabled performance-based choices. No significant

differences were noted for other survey components pre- to post-G4G 2.0.

Plate Cost

The average plate cost for the G4G 2.0 menu was $13.11 per day. This value was based on two weeks of consolidated data when the G4G Program Office team at CHAMP was confident that the planned menu reflected the food costs actually served. This is approximately 11% higher than the established basic daily food allowance of $11.78 per day.[48]

Nutrition Knowledge of Diners

Nutrition knowledge (NK) survey was completed by 269 diners at the two DFACs pre- and post-G4G 2.0 program implementation (Table 5). Nutrition knowledge was compared between diners who were and were not exposed to G4G 2.0 program (n=166) and on prior nutrition education, with the majority (n=201, 75%) having no prior nutrition education. The nutrition knowledge subgroup from the 18-item questionnaire is shown in Table 6. The demographic and lifestyle variables (BMI, sleep and physical activity) were similar between diners with or without G4G 2.0 exposure or nutrition education.

The overall NK scores were similar between G4G 2.0 program exposure groups: 59.8±16% not exposed vs. 59.9±16% exposed (p=0.75). The questions were further categorized into four topics: macronutrients, vitamins and minerals, energy, and hydration. Of the four topics, only macronutrients yielded a significant difference in responses between the groups: 11±3 for G4G 2.0-exposed vs. 10±0 for not exposed (score - range 0-18 points; p=0.043). A greater proportion of G4G-exposed diners were correct and confident regarding the difference in nutrient source between whole, 2%, and 1% milk (22.3% vs. 15.5%, p=0.046). When grouped by nutrition education, a greater proportion of diners with at least one hour of nutrition education were

confident and correct in their responses for the following two NK questions compared to diners without nutrition education: “At least half of the food on their plate should be fruits and vegetable” (53.7% vs. 67.6%; *p*=0.029) and “Dark green vegetables, eggs and fortified cereal are sources of dietary iron sources” (42.8% vs. 66.2%; *p*=0.001) (Figures 7-9).

When examining NK (Figure 10) of the overall sample of diners (n=269), results were concerning for the proportion of confidently incorrect for the questions related to performance nutrition basics. The questions included:: “A recovery drink or snack should always be consumed after exercise” (65.4%); “Protein is an important source of energy for physical activity” (46.5%); “Most military personnel require four times more protein than civilians” (32.7%); “Sports beverage are a preferred beverage when exercising at moderate intensity” (25.7%); “Dietary fats are unimportant for a balanced diet” (20.4%); “Meat is a source of fiber” (24.5%); and “Vitamins and minerals are a source of energy (25.3%).” Only 17% of diners self-reported being extremely/very knowledgeable about their overall nutrition knowledge. The top five sources of nutrition information diners identified as “helpful” were nutrition websites (41%), nutrition health professionals (39%), gym and fitness personnel (38%), fellow Soldiers (33%), and social media (31%).

Nutrition Knowledge of Foodservice Staff

Foodservice staff (n=184) at the two DFACs completed questionnaires pre- and/or post-G4G 2.0 program implementation on NK and G4G program information. Study participants were primarily active-duty military (73%), non-supervisory (73%; 72% of which were junior enlisted), male (60%), and aged (mean ± SD) 25.7±8 year (Table 7). Only 25% of staff completed 50% (4 of 8 modules) of the G4G 2.0 training and 2.7% completed 100% (8 of 8 modules) of the training (Figure 11). The percent of NK questions correctly answered was 55.0±18% with a mean score of 29.2 ± 9 points (NK scores ranged 0-54); however, the percent correct was significantly

higher among trained G4G 2.0 staff compared to those without G4G 2.0 training (58.0±19% vs. 52.9±17%, p=0.025). A greater proportion of G4G 2.0-trained staff were confident and correct in their responses compared to those without training for questions on (1) protein requirements for military (38% vs. 21%, p=0.013) and (2) identifying good sources of iron (62% vs. 41%, p=0.006) (Figure 12).

Although there were no other significant differences between NK responses for G4G-trained and untrained staff, over 25% of staff were confidently incorrect on the ten NK areas (Figure 13): need for a recovery beverage or snack post exercise (72.8%), protein as a source of energy (64.7%), dietary supplement purity and safety (57%), nutrient source between whole, 2%, and 1% milk (42.4%), protein needs of military personnel (41.8%), recommendation for sports drinks after moderate intensity exercise (39.7%), vitamins and mineral as sources of calories (34.8%), meat as a source of fiber (34.2%), meeting dietary vitamin and mineral needs (33.7%) and good food sources of calcium (27.7%). Regardless of the level of G4G 2.0 training or NK, over 85% of staff acknowledged the importance of correct food labeling to maintain diner trust in the G4G 2.0 program.

DISCUSSION

This study evaluated the revised G4G 2.0 program as an intervention to improve Soldier meal quality and diner satisfaction at two Army DFACs. Our results indicate that diner meal quality can be enhanced without compromising satisfaction. Importantly, offering and supporting a high-quality nutrition program implementation is critical to optimizing performance-based foods in DFACs. Although the two DFACs met the benchmarks for most of the PRs, it is possible that if a greater proportion of PRs benchmark were met, meal quality may have improved to an even greater extent. This will require further research.

Although this study is the first G4G 2.0 program evaluation, our findings are consistent with other military DFAC interventions that employed similar elements. In a cross-sectional study, Crombie et al. observed lower intake of energy, fat, discretionary fat, and refined grains along with improved satisfaction in diners at 6 and 12 months after the menu changes, traffic light labels, and presence of educational materials compared to control DFACs.[8] Similarly, a performance nutrition DFAC intervention evaluation by Cole et al. reported an 11-point improvement in HEI-2010 after four months, which was sustained at 12 months compared to the control DFAC.[2] In a military eating environment multiple factors influence food choices and decision-making processes. Ghoniem et al. reported that food availability must be considered in combination with intrinsic motivational factors, such as desire for healthful food and previous learning experiences, as these factors interact to promote choice.[50] The G4G 2.0 program incorporated additional interventional strategies to address these complexities, but it is uncertain as to whether these strategies are sufficient.

Program Fidelity Assessment

The PFA is an objective tool to determine the success of DFACs in implementing the G4G 2.0 program. Evaluating G4G 2.0 implementation at both DFACs using the PFA revealed compliance strengths as well areas for improvement. Scores ranged from 0-100% highlighting the wide range of barriers and facilitators to program implementation success. Of note, the G4G Program Office at CHAMP team provided staff and management training (PR 1, PR 8), food and beverage coding (PR 2), a menu with at least 30% Green-coded items (PR 3), and printed marketing materials (PR 7), all of which facilitated 100% compliance on these PR subsections at both DFACs.

Areas where DFACs did not meet the benchmarks were menu targets and recipe fidelity (PR 3), promotion of Green-coded items (PR 6), and marketing and education (PR 7). A detailed review of the G4G 2.0 implementation data revealed specific challenges with program implementation:

current DFAC infrastructure (physical layout of food stations), limited Green-coded food placement, lack of Green-coded items, and limited promotion of such foods. The foodservice information management system prevented efficient loading and updating of standardized recipes, and frequent staff turnover challenged training efforts. The SMEs used results to focus resource creation, training, and support.

Evaluation of nutrition intervention implementations, such as G4G 2.0, can inform successes, challenges, and areas for improvement. Knowing the degree of program fidelity is critical for overall program execution, improvement, and potential impact on the intended audience of SMs eating in DFACs.

Meal Quality

The G4G 2.0 program facilitated an increase in diner selection and consumption of Green-coded foods with a decrease in consumption of Red-coded foods. The breakfast menu was particularly challenging to update given the nature of traditional breakfast food items with the lowest percentage of Green-coded items (41% vs 61% for lunch and dinner). Increasing nutrient-dense ingredients in DFAC recipes (whole grains, vegetables, beans, fish) translated to increased diner access to more nutritious Green-coded foods. Improvement in meal HEI score was primarily attributed to significant increases in participant selection of Green-coded whole grains, seafood, and plant protein along with a reduced selection of Red-coded refined grains. These results are consistent with those found in the civilian setting. Chen et al. also transformed food choices in a buffet-style cafeteria, successfully increasing diner selection of Green and Yellow-coded foods, with a resultant decrease of Red-coded foods.[23]

Diner Satisfaction

Similar to past military DFAC interventions, the G4G 2.0 program was well-received [8] [2] with diner satisfaction related to the availability of nutritious and performance-based main dishes,

availability of vegetarian options, and the presence of color-coded labels to help select performance-based foods. Maintaining diner satisfaction is crucial to DFAC success as preserving “diner headcount” (number of diners served per meal) can be a leadership concern with “healthy menu” initiatives. Balancing the desire to provide performance-focused menus built from nutrient-dense foods while serving familiar “comfort” foods is challenging yet essential to the success of any military nutrition intervention.

Plate Cost

Each DFAC receives funds allocated to feed each diner per day (“basic daily food allowance”) from which they plan and execute meals.[48] A performance-focused menu raises concerns that incorporating fresh produce, seafood, and whole grains will likely exceed food costs. Similar food cost anecdotal remarks from leaders were observed when planning a menu conversion from ready-to-serve options to scratch-made recipes. Modest increases in the average plate cost of the G4G 2.0 menu may influence the perception of program feasibility by higher-level decision-makers, despite improved meal quality and favorable diner satisfaction results. In the current study, food cost increases appeared attributable to large variations in daily projected diner headcount, which disrupted accurate forecasting and production. A transient increase in plate cost was expected with the initial G4G 2.0 menu implementation due to significant menu changes. Future research is needed to assess the plate cost changes with improvements in meal forecasting and reduction ins food waste reduced.

Nutrition Knowledge

<u>Diners’ Nutrition Knowledge</u>

This study highlights the widespread suboptimal nutrition knowledge (<60% correct responses) among warfighters on general and performance nutrition despite G4G program exposure and previous nutrition education. The G4G 2.0 program is designed to translate nutritional guidance

into easily identifiable high-performance menu options; however, it does not target education on the NK deficit areas. The reported sources for NK may contribute to the high proportion of confidently incorrect responses. Poor NK could be one of the many factors hindering improvement in overall meal selection.

DFAC Staff Nutrition Knowledge

Regardless of G4G 2.0 training completion or type of G4G training sessions attended, the DFAC staff scored poorly on the NK test. Foodservice staff can be a force multiplier when implementing a nutrition intervention as their efforts may determine the quality of food service outcome. Foodservice staff with a poor understanding of nutrition concepts will likely be challenged to implement a nutritious menu comprised of nutrient rich recipes using healthy food preparation practices. Innovative interactive strategies are needed to assess, educate, and empower foodservice staff at fast-paced military DFAC operations.

Strengths and Limitations

The greatest strength of this study was a closely engaged G4G Program Office team at CHAMP, who were involved with study site program implementation, including designing the study menu (led by collaborators at the Armed Forces Recipe Service), printing marketing materials, assembling color-coded food cards, and leading in-person training to DFAC staff and management. The implementation team was not involved with survey or meal quality data collection. Other strengths included program components that emphasized user-friendly traffic light labels, educational materials, and food placement for quick and easy selection of nutritious offerings. Additionally, digital food photography served the dual purpose of participant burden reduction with data collection and provision of accurate insight into diner food consumption. Given the fixed price per diner, there was no ability to track sales of specific items offered or to

assess food selection changes. Digital photography of food consumed is a much stronger reflection of changes in actual food intake than sales data (citation from food photography section).

Despite the strengths, several limitations were identified. In relation to the study design, a control DFAC was not available as a reference for G4G 2.0 implementation comparison. The current study gathered data at only two time points (pre- and post-G4G 2.0 implementation) over a shorter period compared to other military DFAC studies.[2,8] Use of different participants at pre- and post-G4G 2.0 implementation precluded the ability to assess within and between subject changes over time. Participant attrition in the current study was likely due to factors out of the participants' control. Modifiable personal preferences to attain meals elsewhere may influence dining location despite the voluntary commitment to the study. In addition, although SM may routinely eat at the study DFAC, changes in training missions, time and travel constraints, and unexpected additional duties may divert them away from dining at the study DFAC. These factors are anecdotally observed in military studies, are understandable given mission priority, but nonetheless challenging to researchers.

Regarding program fidelity, uncontrollable factors such as frequent turnover of DFAC management resulted in challenges with adequate training and marketing, and inaccurate preparation of menu items. Lessons learned from the current intervention will inform future studies seeking to improve diner access to tasty, appealing high-performance food choices. There is a need for on-going, well-designed research to evaluate nutrition program implementation and its impact as well as to better understand diners' food-related behaviors. Additional, increasing the leadership's awareness of optimal nutrition and how they can support soldier fueling, may reduce program barriers impeding full program implementation.

CONCLUSIONS AND IMPLICATIONS

G4G 2.0 is a comprehensive DFAC nutrition intervention aimed to offer tasty high-performance (Green-coded) menu items to optimize nutritional fueling. Despite system-wide related barriers, the revised G4G 2.0 program's multifaceted approach yielded positive results in meal quality and diner satisfaction at two fast-paced DFACs. Through this study, a much-needed mechanism to assess program fidelity was developed and iteratively refined.

G4G 2.0 successfully improved meal quality by nine points through significant improvements in selection of whole grains, seafood and plant proteins, fewer refined grains, and improved trends for other food groups. Menu revisions built on updated recipes (more whole grains, vegetables, and seasonings beyond salt) increased the availability of Green-coded foods and reduced the number of Red-coded foods successfully translating to significantly increased diner selection of Green-coded and fewer Red-coded food choices.

The improvement in meal quality occurred without detrimental impact on diner satisfaction and only a modest increase in plate cost. Some aspects of satisfaction improved which infers high acceptability of performance-focused, nutrient-dense menu items. Challenges observed in program implementation are not unique to the military settings. Overcoming these challenges could further enhance program implementation by positively impacting availability, access, and knowledge of performance-boosting foods.

Nutrition knowledge of DFAC foodservice staff and diners may impact the quality of foods served and actual meals consumed. Innovative interactive strategies are needed to educate and empower foodservice staff at fast-paced military DFAC operations. Enhanced NK can enable DFAC staff as stewards of nutrition programs, helping to translate program requirements into actual foods served. Pre-crafted G4G messaging through social media and the G4G website may increase SM awareness about performance-focused food choices. In addition, standardized nutrition education for SM at fitness centers, health clinics, and by nutrition

professionals embedded within the units, can provide the foundational knowledge needed to make better food choices.

RECOMMENDATIONS

Future research should continue to evaluate facilitators and barriers to availability, access, cost, and consumption of performance-based food options, and outcomes related to health and performance. Several recommendations are proposed:

1. Invest in nutrition programs implemented within military dining facilities as they provide crucial opportunities for pairing high-performance fueling options with education on nutritional fitness and mission readiness.
2. Develop standardized education materials (class, infographics, messaging, etc.) that increases the nutrition knowledge of DFAC diners as well as the DFAC foodservice staff. Arming SMs and leaders with credible nutrition information can influence optimal nutrition-related decisions even in an environment with limited choices. Innovative interactive strategies are needed to assess, educate, and empower DFAC staff at fast-paced operations.
3. Further develop a G4G 2.0 program communication plan to increase awareness that the G4G program is an evidenced-based best practice program. Upon completion of this study, the G4G Program Office at CHAMP prioritized communication of program resources and support. They launched a quarterly G4G Newsletter, including a spotlighted success story, targeted at G4G program operators and advocates. The G4G Team developed a focused social media schedule on the G4G Facebook page to target resources, news, success stories, and program updates for program operators. The G4G Program Office at CHAMP posted material created for the study site DFACs (templates, marketing materials, toolkits) on the public-facing website for DoD G4G

program operators and advocates (https://www.hprc-online.org/nutrition/go-green). Efforts are underway to close the gaps in resources and further develop the G4G website.

4. Conduct a new G4G study protocol (IRB approved by USUHS) in which several sites focus on 2-3 targeted G4G PR areas found deficient from this study. Program components such as menu enhancements, staff training, marketing, social media promotion are self-identified areas of interest by local facilities. The study should target key areas such as increasing menu and serving options (plant-forward, station style feeding operations) and non-traditional dining venues (snack bars, fueling stations, dining in afloat facilities).
5. Support G4G 2.0 required 5-year cycle program updates.

Evidence from this research study, the current targeted research studies, along with input from nutrition and foodservice experts across the DoD will contribute to programmatic changes. Future program implementation could involve more customized options for PRs, as this research showed not all PRs need to be implemented completely for diner impact. High-quality nutrition interventions in DFACs have the potential to impact SM nutritional fitness and mission readiness by improving the availability, access, and knowledge of performance-focused choices.

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Table 1. Evolution of the Go for Green® Program

Program Requirement (PR)	Original G4G (2008)	G4G 1.5 (2015)	G4G 2.0 (Current)
PR 1: Standardized Training for Management	—	√	√
PR 3: Assign Traffic Light Color Codes Based only on Approved Coding Algorithm	√	√	√
• Coding by only designated professionals	—	√	√
PR3: Menu Targets: Minimum Green-Coded Items	—	√	√
PR 4: Standardized Food Cards	√	√	√
PR 5: Food Placement Strategies	—	√	√
PR 6: Promotion of Green-coded Items	—	—	√
PR 7: Marketing and Education			
• Printed materials	√	√	√
• Social media, other media & press	—	—	√
• Nutrition education for diners	—	—	√
PR 8: Standardized Training for all Staff			
• Initial	—	√	√
• Ongoing	—	—	√

PR = Program Requirement; G4G = Go for Green.

Table 2. Demographic and lifestyle characteristics of active-duty military personnel consuming meals at two large military dining facilities pre- and post-G4G 2.0 program implementation (n=100)

Variables[a]	Pre G4G[b] (n=63)	Post G4G (n=37)	*P*-value
Age, y (median±IQR[c])	22.0±4	22.0±4.5	0.64
Sex			0.98
Male, n (%)	58 (92.1)	34 (91.9)	
Female, n (%)	5 (7.9)	3 (8.1)	
Race, n (%)			0.08
White	39 (61.9)	29 (78.4)	
Black / African American	14 (22.2)	5 (13.5)	
Native American/Alaskan Native/Hawaiian	2 (3.2)	1 (2.7)	
Asian	4 (6.3)	2 (5.4)	
Other	4 (6.3)	0 (0)	
Ethnicity, n (%)			0.47
Hispanic	10 (15.9)	8 (21.6)	
Not Hispanic	53 (84.1)	29 (78.4)	
Education, n (%)			0.80
Some High School/High School	38 (60.3)	23 (62.2)	
Post High School/Associates Degree	22 (34.9)	13 (35.1)	
Bachelors/Graduate Degree	3 (4.8)	1 (2.7)	
Military Rank, n (%)[d]			**0.02**
E1-E4 (Junior Enlisted)	62 (98.4)	32 (86.5)	
E5-E7 (Senior Enlisted)	1 (1.6)	5 (13.5)	
BMI, kg/m^2 (median±IQR)[e]	25.4±5.5	25.4±4.4	0.66
Physical Readiness Rating, n (%)			0.74
Good-Best Shape	48 (76.2)	27 (73)	
Neither Good Nor Bad	13 (20.6)	9 (24.3)	
Not Good- Worst Shape	2 (3.2)	1 (2.7)	
Daily Vigorous activity, hours (median±IQR)	1.5±1.0	1.0±1.0	0.63
Daily Moderate activity (hours) (median±IQR)	1.0±1.3	1.0±1.0	0.38
Daily Walking (hours) (median±IQR)	1.0±2.5	1.5±3.5	0.56
Total Sitting/week (hours) (median±IQR)	4.0±4.0	5.0±3.3	0.62
Army Physical Fitness Test Score (median±IQR)	249±64	244±55	0.89
Sleep hours (median±IQR)	6.5±2.0	6.0±1.5	0.44

[a] Self-reported data; [b]G4G =Go for Green® intervention; [c] IQR= interquartile range

[d] Rank, E=Enlisted. E1-E4 = Private, Private First Class, and Specialist; E5-E7 = Sergeant, Staff Sergeant, Sergeant First Class.

[e] BMI = Body Mass Index, estimated from self-reported height and body weight.

Table 3: G4G 2.0 Program Requirements with Benchmarks & Results from Two Sites

PR # and Description	Benchmark %	Site 1 %	Site 2A %	Site 2B %
PR1: Standardized Training for Management	100	100	100	100
PR2: Assign Traffic Light Color Codes	100	100	100	100
PR3: Menu Targets	75	66	99	81
• PR3.1: Minimum Green-coded items	100	100	100	100
• PR3.2: Planned vs. Served Menu	75	98	96	61
• PR3.3: Recipe Fidelity	75	0	100	NA[a]
PR4: Standardized Food Cards	75	89	97	91
PR5: Food Placement Strategies	75	75	93	97
PR6: Promotion of Green-coded Items	75	67	50	44
PR7: Marketing and Education	75	37	45	42
• PR7.1: Print Materials	75	100	100	100
• PR7.2: Social Media	75	0	0	0
• PR7.3: G4G Grand Opening	75	70	80	80
• PR7.4: Post-Grand Opening	75	14	NA[b]	29
• PR7.5: Nutrition Education	75	0	0	0
PR8: Standardized Training for all Staff	80	84	66	66
• PR8.1: Led by Certified Staff Trainer	100	100	0	0
• PR8.2: Standardized Slide Deck Training	80	68	99	99
• PR8.3: Hands-on Training	80	NA[c]	100	100

PR: Program Requirement

Site 1: Wolf DFAC

Site 2: Freeman Café; 2A= Grand opening; 2B= After 3 months of G4G implementation

Green highlighted= Compliance to PR (areas to sustain)

Red highlighted = Noncompliance to PR (areas to improve upon)

Table 4. Perceived changes in components of meal satisfaction and point-of-service nutrition labeling reported by participants consuming meals at two large military dining facilities pre and post-G4G program implementation (n=100)

17-Item Patron Satisfaction Survey[a]	Pre G4G[b] (n=63) Agreements		Post G4G (n=37) Agreements		Pre-Post *P*-value
	n	%	n	%	
1. Appearance of the food is pleasing	36	58	18	49	0.49
2. Flavor and taste of the food is good	33	52	16	43	0.67
3. Choices available are adequate	27	44	18	49	0.33
4. Availability of healthy foods is adequate	33	52	25	68	0.07
5. Availability of performance foods is adequate	31	49	17	46	0.79
6. Portion sizes are appropriate	29	47	22	60	0.14
7. Availability of fresh fruit is adequate	45	71	23	62	0.51
8. Salad bar offers a variety of fresh vegetables	32	51	22	60	0.38
9. Main dishes served: healthy & performance-based	20	32	21	57	**<0.01**
10. The side dishes are served without added fat	27	43	16	43	0.43
11. Healthy/performance-based dessert are available	15	24	11	30	0.07
12. Temperature of hot and cold foods is just right	32	51	19	51	0.71
13. Vegetarian food choices are available	16	25	14	38	**0.02**
14. DFAC[c] nutrition labels easy to use	30	48	23	62	0.19
15. Nutrition labels enables performance-based choices	30	48	24	65	0.09
16. Use DFAC nutrition labels to choose healthy foods	26	41	20	54	0.05
17. Use nutrition labels to choose performance foods	24	38	20	54	**0.04**

[a] Self-reported data; [b]G4G = Go for Green® intervention; [c] DFAC = Dining Facility

Table 5. Demographic and lifestyle characteristics of DFAC patrons who completed nutrition knowledge survey pre- and post-Go for Green® 2.0 program implementation

Variables[a]	Patron (n=269) n(%)
Age, y (mean ± SD[c])	22.41±3.3
Sex	
Male, n (%)	216 (80.3)
Female, n (%)	53(19.7)
Race, n (%)	
White	161(60.1)
Black / African American	71 (26.5)
Native American/Alaskan Native/Hawaiian	7 (2.6)
Asian	14 (5.2)
Native Hawaiian/Pacific Islander	1 (0.4)
Other	14 (5.2)
Ethnicity, n (%)	
Hispanic	73 (27.1)
Not Hispanic	196 (72.9)
Education, n (%)	
Some High School/High School	164 (61.0)
Post High School/Associates Degree	95 (35.3)
Bachelors/Graduate Degree	10 (3.7)
Years of Service	2.4 ± 2.8
Military Rank, n (%)[d]	
E1-E4 (Junior Enlisted)	257 (95.5)
E5-E9 (Senior Enlisted)	12 (4.5)
Warrant Officer	-

BMI (Adjusted), kg/m^2 (mean ± SD)[e]	25.3±3.1
Physical Readiness Rating, n (%)	
Good-Best Shape	180 (66.9)
Neither Good Nor Bad	79 (29.4)
Not Good- Worst Shape	8 (2.9)
Daily Vigorous physical activity, hours (mean ± SD)	1.5±1.0
Daily Moderate physical activity (hours) (mean ± SD)	1.4±1.4
Army Physical Fitness Test Score	243±43
Sleep hours (average)	6.3±1.5

[a] Self-reported data

[b] G4G = Go for Green intervention

[c] SD = standard deviation

[d] Rank, E = Enlisted; E1-E4 = Private, Private First Class, and Specialist; E5-E7 = Sergeant, Staff Sergeant, Sergeant First Class

[e] BMI = Body Mass Index, estimated from self-reported height and body weight

Table 6: Nutrition Knowledge Subgroups from the 18-Item Nutrition Knowledge Questionnaire

Macronutrients	
	• Most plants, fish, nuts and seeds are sources of unsaturated fats. • Whole milk is a better source of protein than 2% or skim milk . • Dietary fat is not considered an important part of a balanced diet. • At least half of the food on your plate should be fruits and vegetables. • Most military personnel require about four times more protein than civilians. • Meat is a good source of fiber**.**
Vitamins & Minerals	
	• Dietary supplements are regulated by the government for purity (cleanliness) and safety before sale. • Good sources of calcium include bread, steak, and corn. • Vitamins and minerals are sources of calories. • Iron is found in dark green vegetables, eggs, and fortified cereal. • As long as enough calories are consumed, vitamin and mineral needs of military personnel are met.
Energy	
	• As long as I am physically active and not overweight, I can eat whatever I want and be healthy. • A recovery beverage or snack should always be consumed after exercise. • Protein is the most important source of energy (calories) for physical activity. • Carbohydrates are the main fuel for mental performance. • Body fat is an important source of energy at rest and during long-duration exercise.
Hydration	
	• Replacing lost body weight from an exercise session with fluid is important. • Sports drinks are always the preferred beverage when exercising at moderate intensity.

Table 7. Demographic characteristics of food service staff from two large military dining facilities based on level of exposure to the performance nutrition programs (n=184)

Variables[a]	Staff[b] (n=184) n(%)
Age, y (mean ± SD[c])	25.67±8
Supervisor	38 (27)
Non-supervisor	102 (72)
Sex	
Male, n (%)	109 (60)
Female, n (%)	73 (40)
Education, n (%) (n=135)	
Some High School/High School	70(52)
Post High School/Associates Degree	57 (42)
Bachelors/Graduate Degree	8 (6)
Military Rank, n (%)[d] (n=134)	
Officer/Warrant Officer	2 (2)
Enlisted	132 (99)
E1-E4 (Junior Enlisted)	97 (72)
E5-E9 (Senior Enlisted)	35 (26)
Time Working at Dining Facility	
Less than 1 year	84 (46)
1 year but less than 3 years	78 (42)
3 or more years	22 (12)
Attended staff training session on G4G in last 6 months	77(42)

[a] Self-reported data; [b] Civilian and active duty military personnel; [c] SD = standard deviation
[d] Rank, E = Enlisted; E1-E4 = Private, Private First Class, and Specialist; E5-E9 = Sergeant, Staff Sergeant, Sergeant First Class, Master Sergeant, Sergeant Major

Figure 1. G4G 2.0 standardized traffic light labeling criteria and logos

Symbols: Checkmark = Green, caution sign = Yellow, stop sign = Red

Figure 2. G4G Study Implementation and Timeline
Note: T-1 occurred at only 1 site

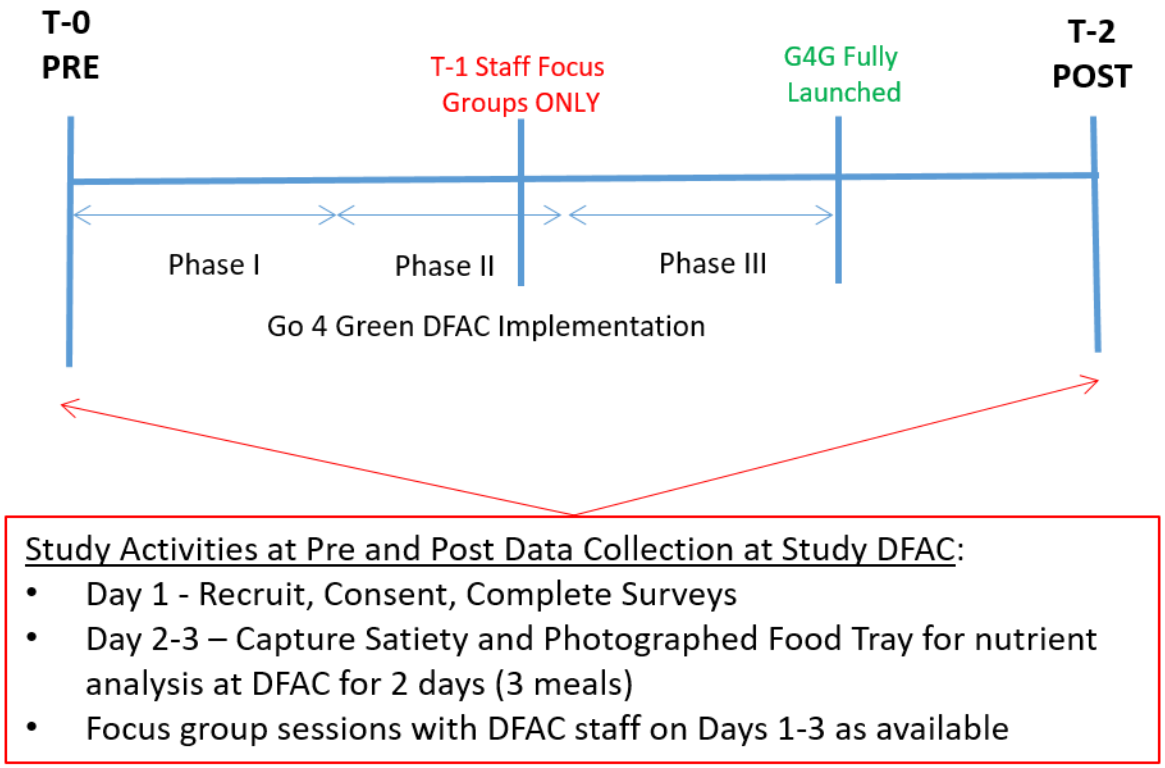


Figure 3. Digital Food Photography Station Example

Figure 4. Healthy Eating Index (HEI-2015) component food group and total median scores among participants consuming meals at two large military dining facilities pre- and post-Go for Green® (G4G) program implementation (n=100)

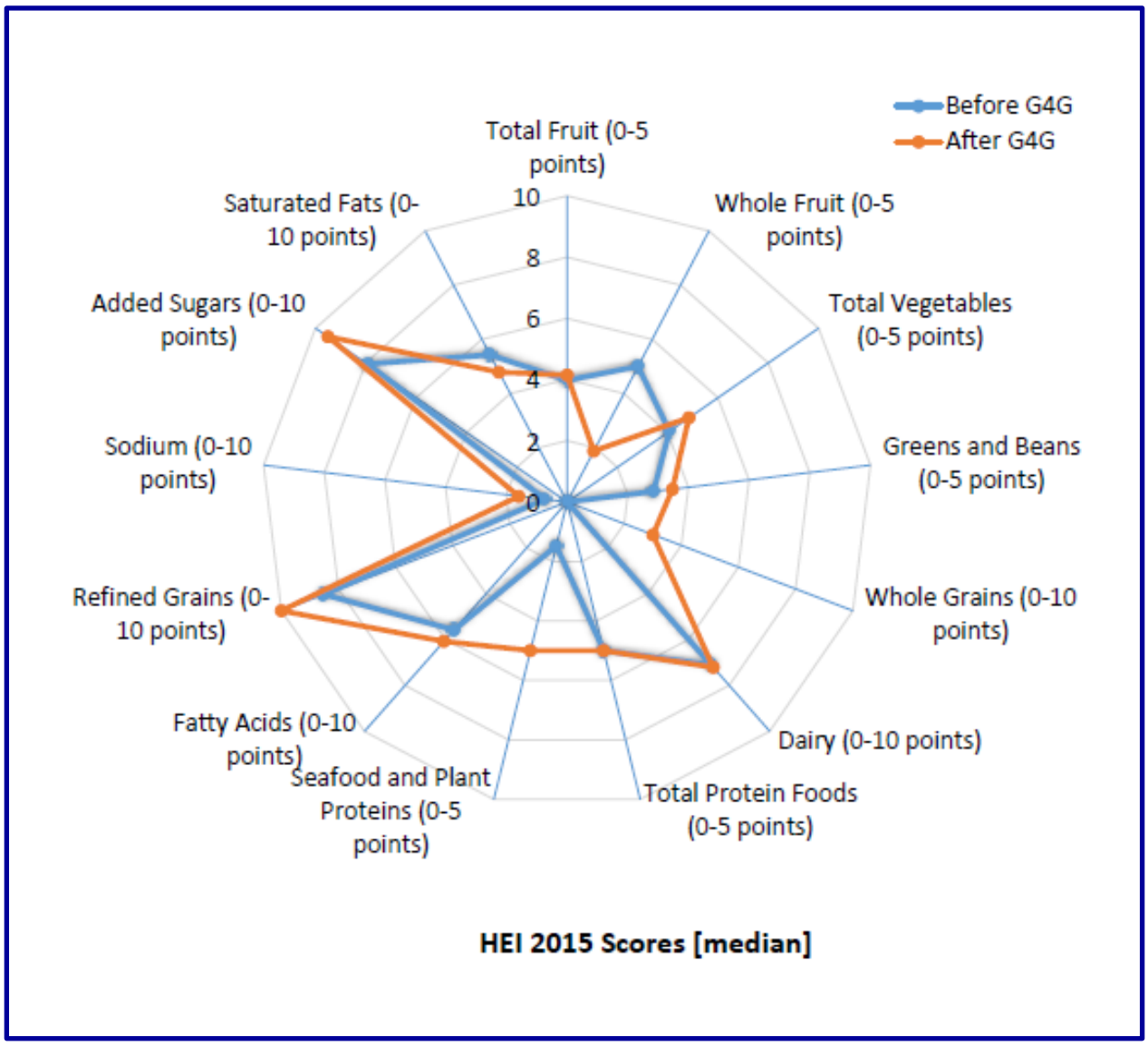
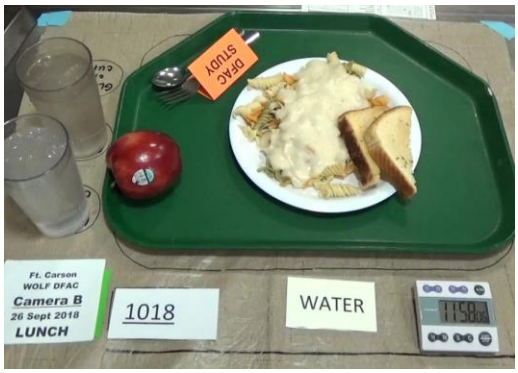


Figure 5. Examples of meals with high and low HEI-2015 scores

Meal	High HEI	Low HEI
Breakfast	 HEI =86	 HEI =25
Lunch	 HEI =88	 HEI =33
Dinner	 HEI =84	 HEI =37

Note: HEI scores calculated based on amount consumed vs. selected.

Figure 6. Overall meal and per meal changes in Green, Yellow, and Red food items of participants consuming meals at two large military dining facilities pre- and post-Go for Green® 2.0 program implementation (n=100)

Figure 7. Nutrition knowledge levels (%) reported by military dining facility diners (n=269)

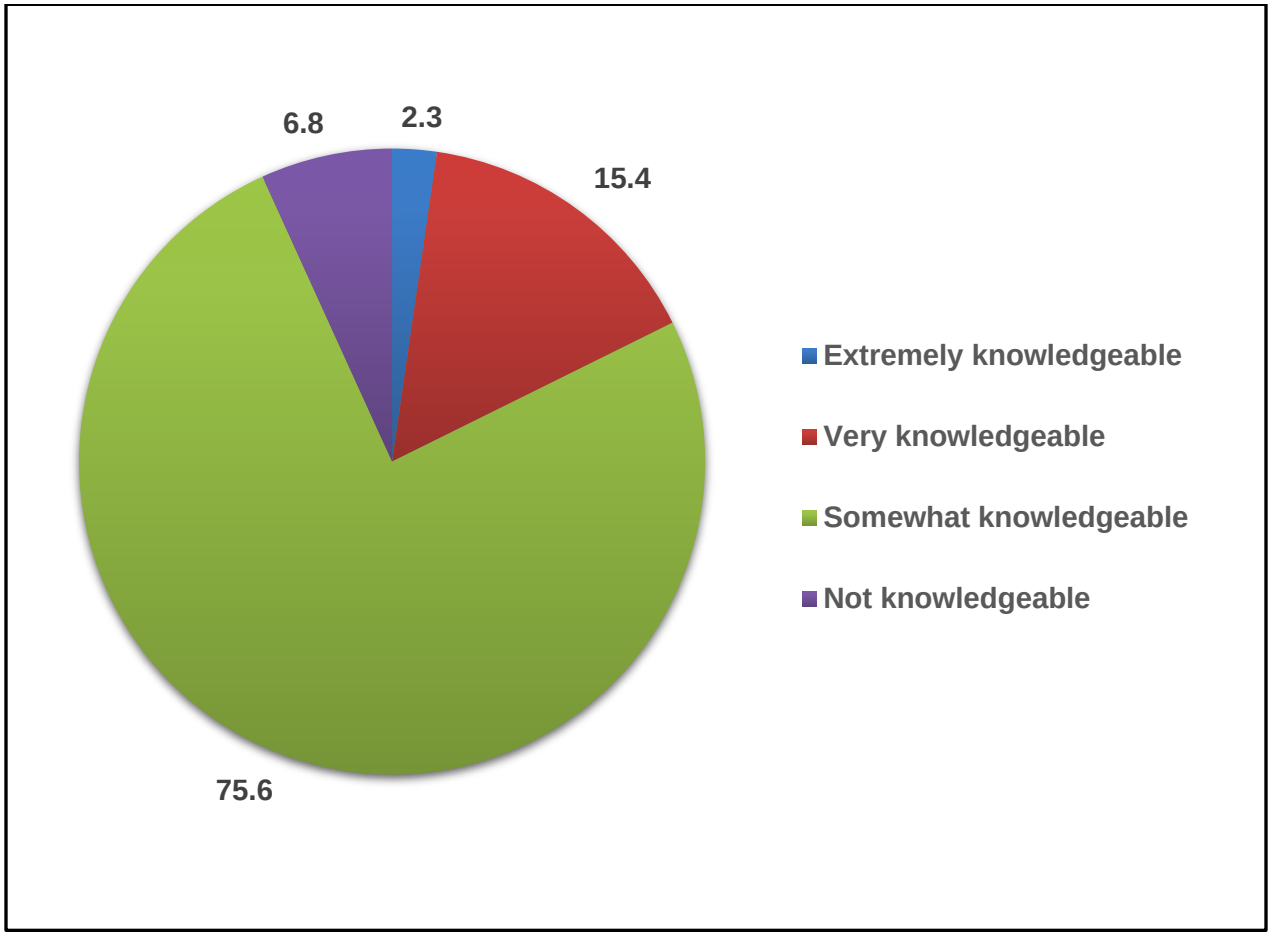


Figure 8. Extent of military/civilian nutrition education received by military dining facility diners (n=269)

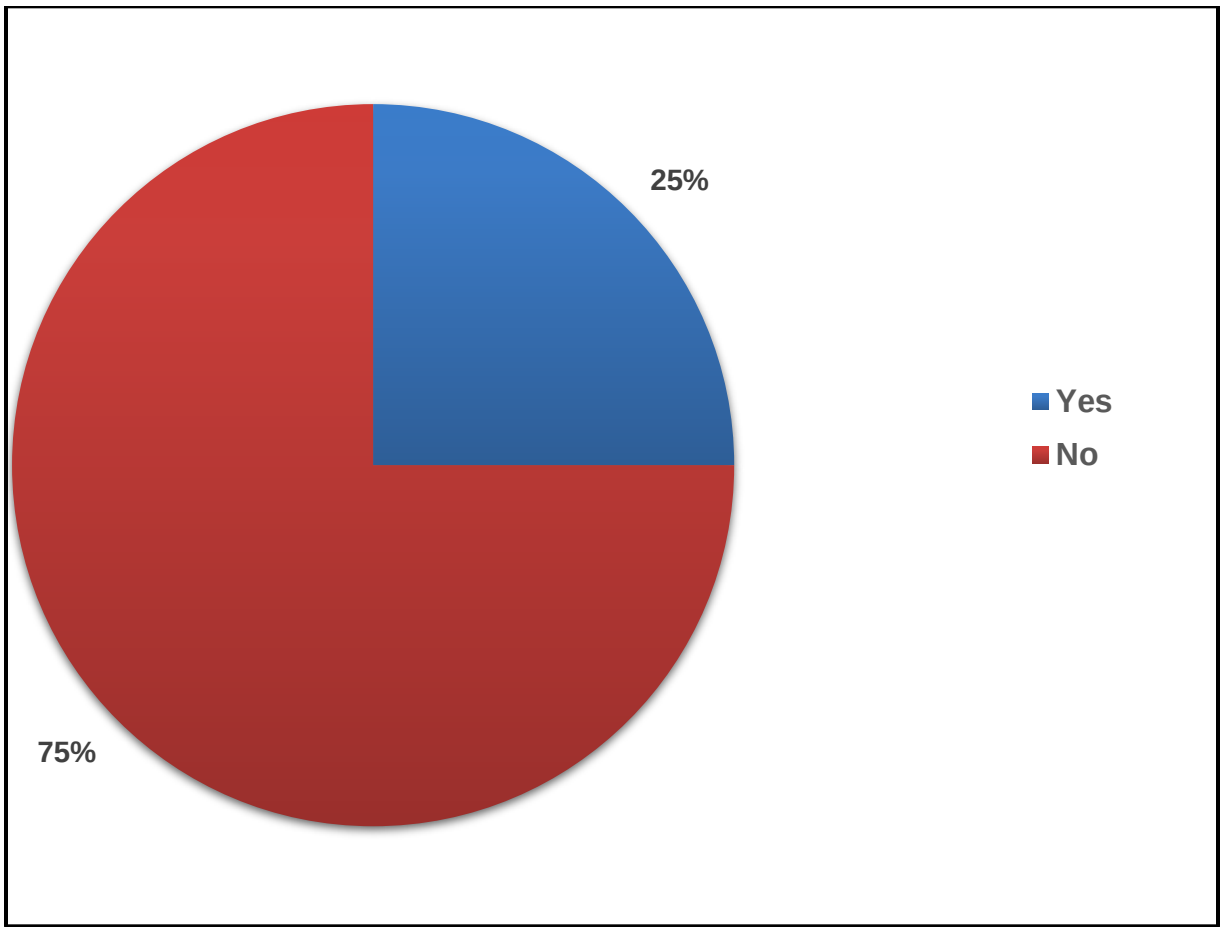


Figure 9. Hours of nutrition education received by military dining facility diners (n=269)

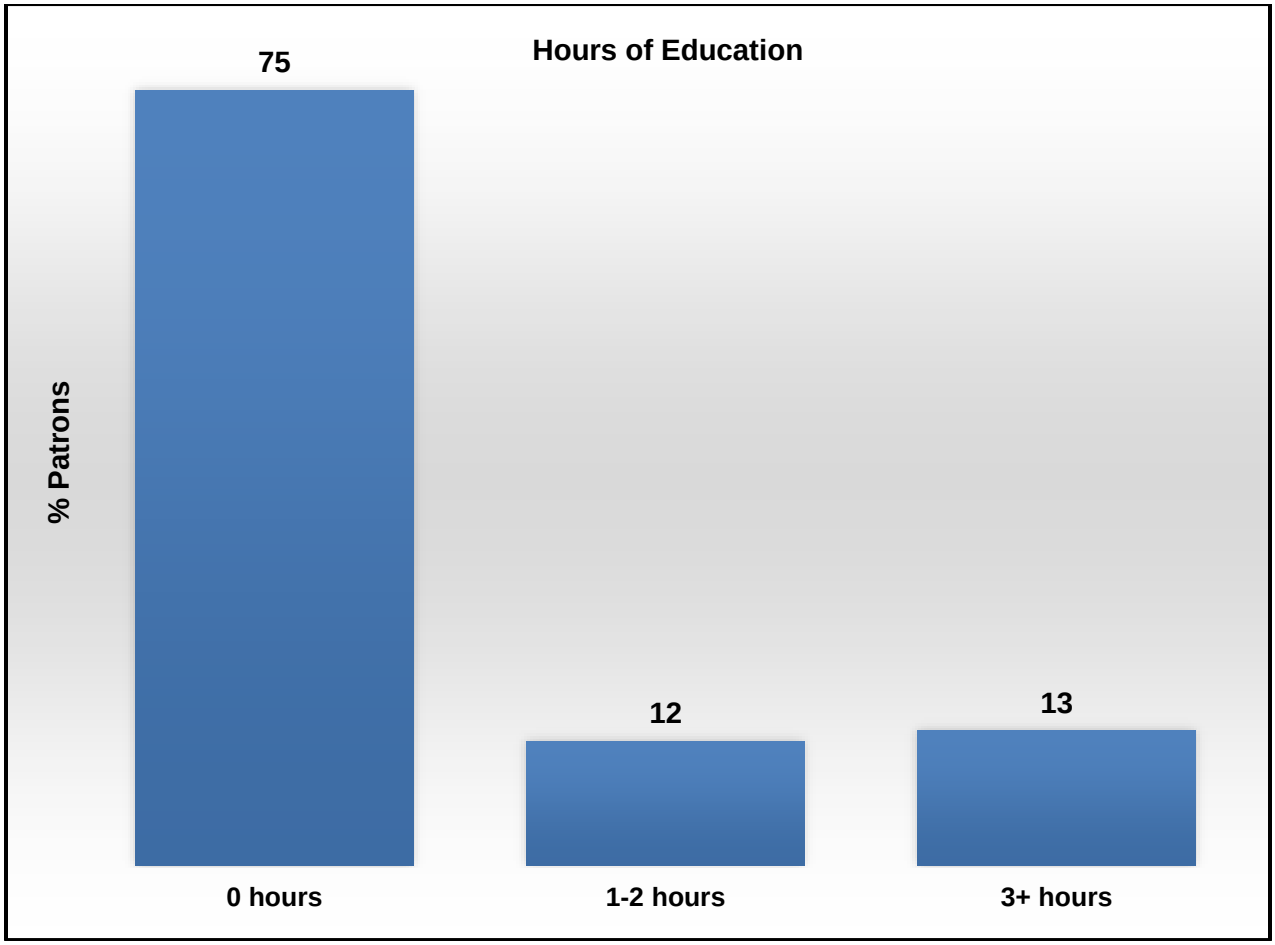


Figure 10. Military dining facility diners responses to 18 nutrition knowledge questions (n=269)

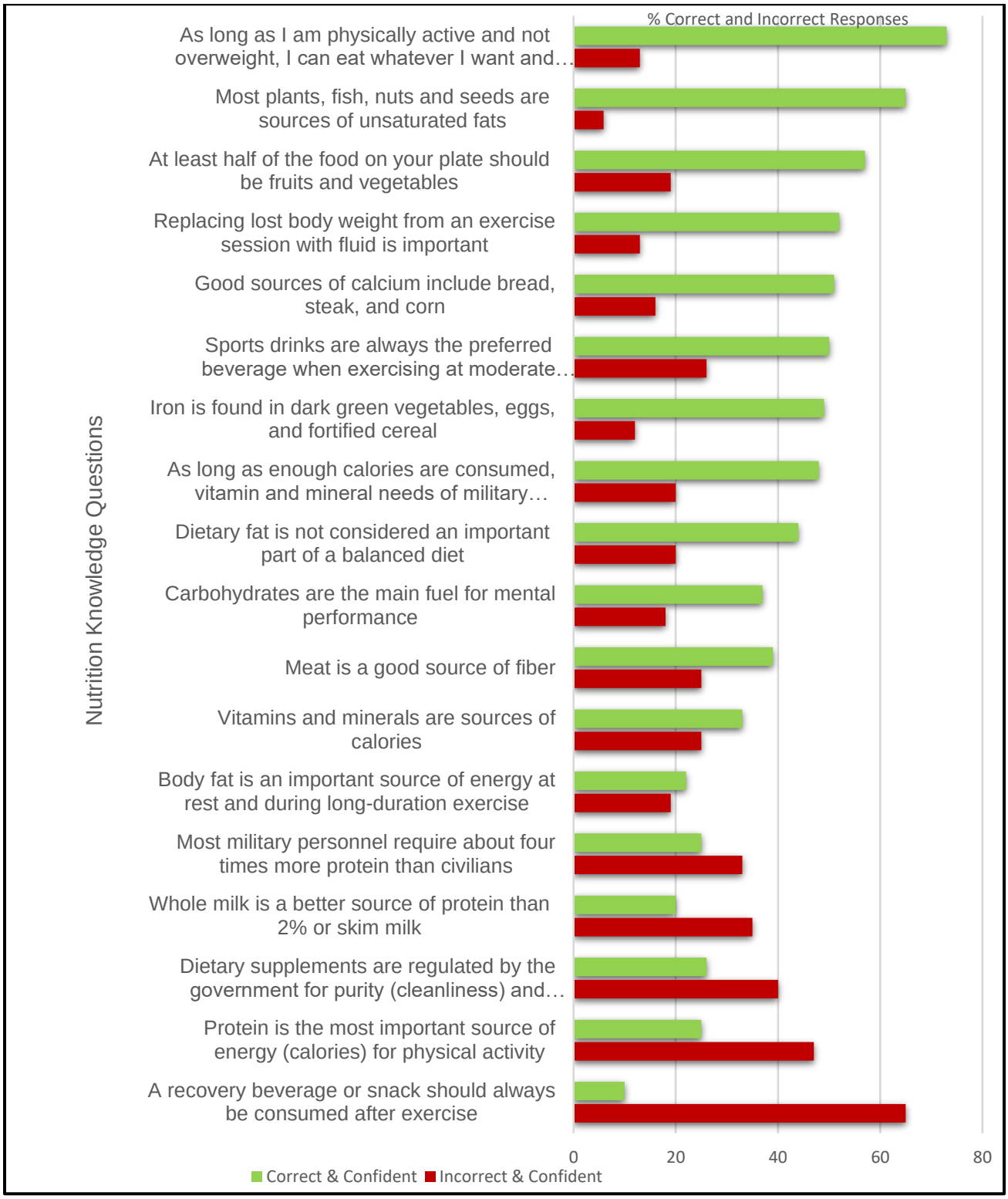
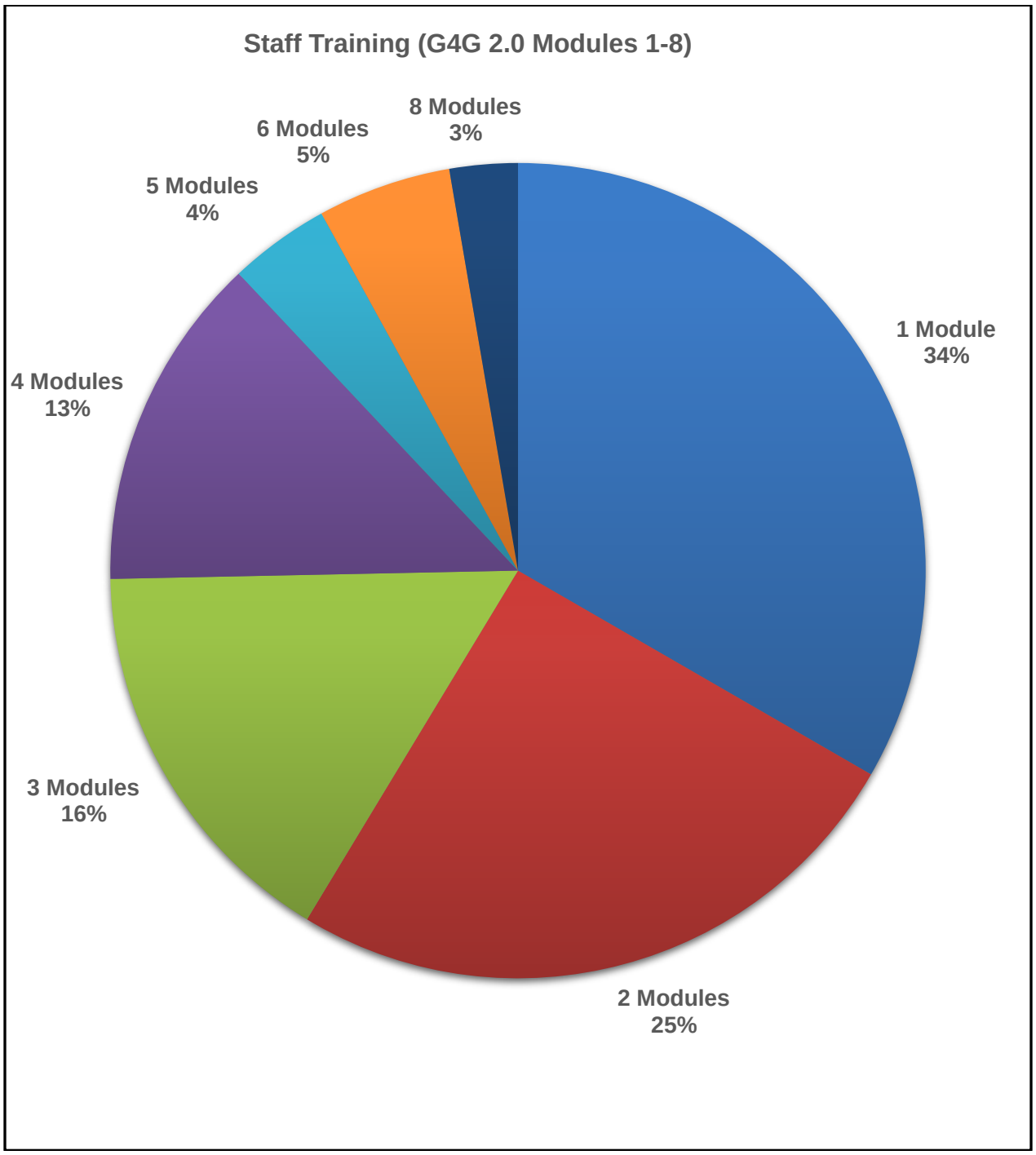
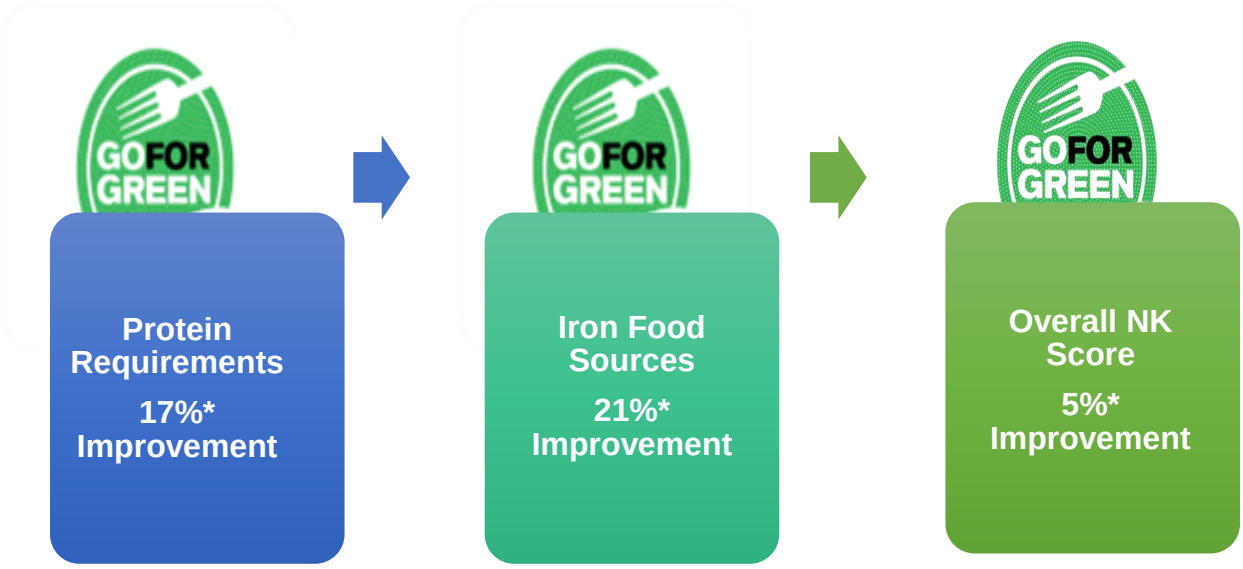


Figure 11. Level of food service staff training during G4G 2.0 program implementation



Foodservice staff exposed to G4G, only 25% completed 50% (4-8 modules) of the G4G training and 2.7% completed 100% (1-8 modules) of the training.

Figure 12. Food service nutrition staff knowledge improvement with exposure to G4G 2.0 program (n=184)

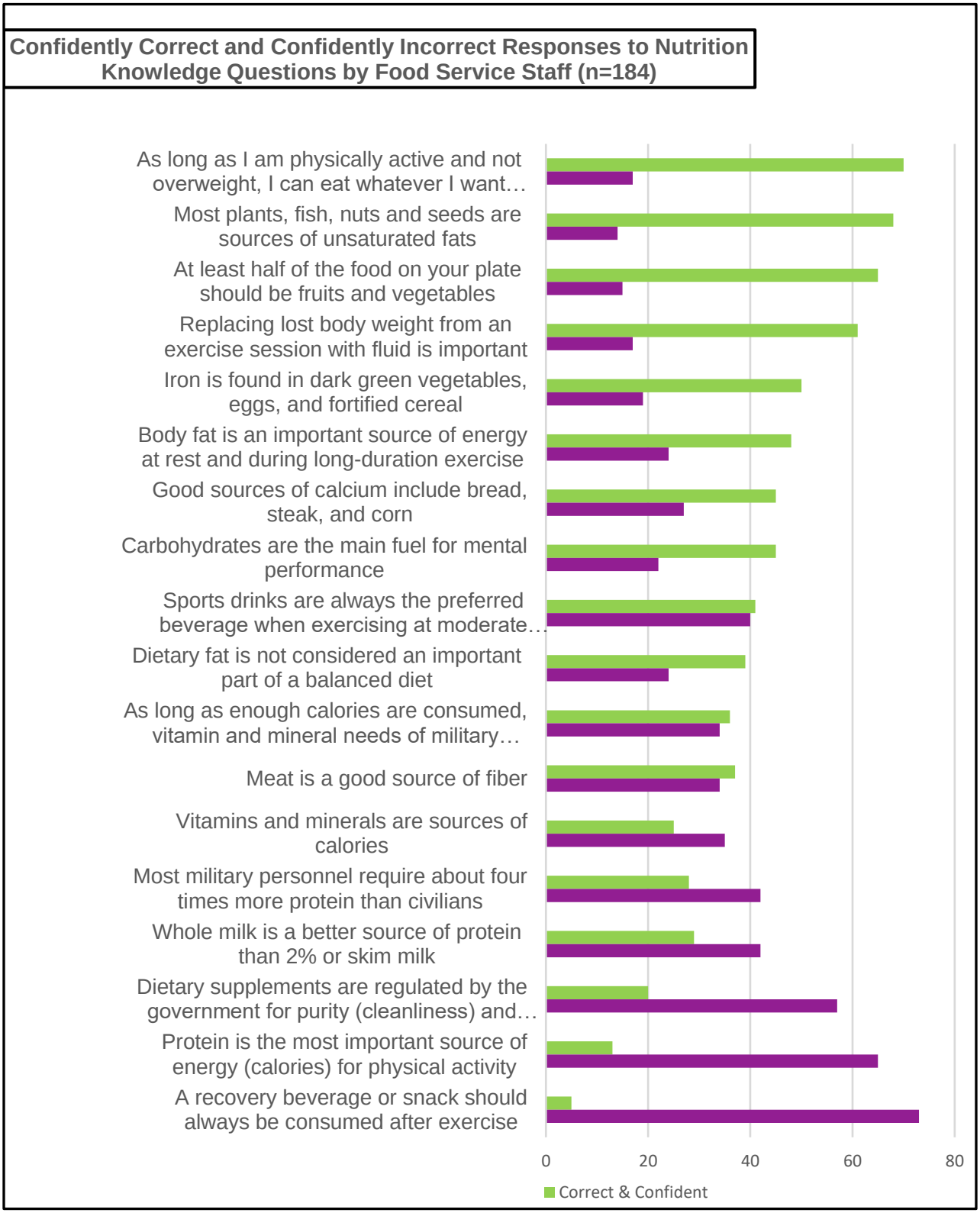


NK=Nutrition Knowledge

*P <0.05

Improvement in Food Service Staff Nutrition Knowledge Scores with any Exposure of G4G 2.0 Program (n=184)

Figure 13. Food service staff response to 18 nutrition knowledge questions



Appendix A: Go for Green® 2.0 Program Requirements

Note: The information is from below listed website and used here with permission of collaborators.
For full details on G4G program: https://www.hprc-online.org/sites/default/files/document/G4G_GR_Revise%2520Program%2520Requirement%2520links_011018.pdf

The Go for Green® (G4G) 2.0 food and recipe coding criteria are based on established guidelines, such as the Dietary Guidelines for Americans 2010[1] and subsequently 2015–2020 Dietary Guidelines for Americans[2], Military Dietary Reference Intakes (MDRIs)[3], joint regulation Nutrition and Menu Standards for Human Performance Optimization (AR 40–25/ OPNAVINST 10110.1/ MCO 10110.49/AFI 44–141)[4], Department of Defense Food Service Program (DoDI 1338.10)[5], and Joint Subsistence Policy Board DoD Menu Standards (DoDM 1338.10)[6]. G4G coding criteria also consider the specific and unique nutrition needs of the military community, where certain nutrient requirements are affected by extreme physical activity and environments[3].

Through its criteria for Green-coded foods and beverages, G4G promotes a balanced nutrient-dense eating pattern of fresh fruits and vegetables, whole grains, lean protein, low-fat dairy products, and healthful fats, which mirrors the focus of the 2015–2020 Dietary Guidelines for Americans. This dietary pattern optimizes intake of naturally occurring electrolytes (such as potassium, calcium, and magnesium), antioxidants, phytochemicals, vitamins, minerals, and dietary fiber. When Service Members select appropriately across all food groups, they eat a balance of macronutrients (carbohydrates, protein, and fats) and micronutrients to optimize performance, readiness, and health.

The G4G Criteria consider the complexity of the overall nutritional value of a food, beverage, or recipe and summarize the results in one of three easy-to-read color codes: Green, Yellow, or Red. This stoplight-labeling system makes it easier for Service Members to identify the best fuel for their performance and health. Research supports using stoplight-labeling systems because consumers find the information effective and easy to understand[7]. There already is a strong association between colors (Green, Yellow, and Red) and meaning (Green means "go")[8], which minimizes the amount of education Service Members need on how to use G4G.

G4G promotes eating more Green-coded foods—to at least half of all food choices—when feasible. Yellow- and Red-coded menu items still will be offered daily in military dining facilities. These items provide variety and fit into an overall nutritious eating pattern when consumed in moderation. Red-coded "comfort" foods and beverages also can help boost morale at times.

Revision and Approval Cycle

The science and research in the field of nutrition is constantly evolving. Therefore, G4G coding criteria will be reviewed, updated, and reapproved for major changes every five years to include the latest nutrition information and recommendations. In addition, G4G Criteria review and reapproval will occur when significant changes are made to the U.S. Food and Drug Administration (FDA) Nutrition Facts panel or when substantial policy changes are made requiring alignment. The next scheduled criteria review will occur in 2020 in order to allow time for adoption of the revised G4G 2.0 initiative as determined by each Service. In addition, this time point will align with the publication of the 2020–2025 Dietary Guidelines for Americans.

Alignment with G4G Coding Algorithm

The G4G Coding Algorithm is the practical application of the G4G Criteria, which are evidence-based but not readily operationalized. These two documents enable G4G coding, or the assignment of color codes to menu items. To maintain standardization, only a Certified G4G Coder can assign color and sodium codes to menu or ready-to-use items.

Evidence Basis for Criteria by Component

G4G 2.0 color-code assignment of foods and beverages is based on the following criteria: saturated fats, fiber, sugar, processing, and total fat. No one criterion (fat, sugar, fiber, etc.) determines the color code for an item;

instead, coding is assigned based on a combination of all criteria. Similarly, no single ingredient determines the color code of a recipe. A few exceptions—such as the presence of MSG, use of trans fats, or deep-fry cooking method—result in an automatic Red code. The G4G Criteria aim to identify the overall nutritional quality of foods and beverages. Items coded Green must provide nutritional value, not just lack undesirable nutrients. The following table is a snapshot of the criteria and is not meant as a coding tool.

GREEN, YELLOW, & RED FOOD CODES			
GO FOR GREEN · EAT WELL · PERFORM WELL			
PROCESSING	LEAST-PROCESSED	SOME PROCESSING	MOST-PROCESSED FOODS
NUTRIENTS	WHOLE FOODS, NUTRIENT PACKED	SOME HEALTHFUL NUTRIENTS	LOWEST-QUALITY INGREDIENTS
FIBER	HIGH IN FIBER	LOWER IN FIBER	MINIMAL FIBER
SUGAR	LOW IN ADDED SUGAR	ADDED SUGAR OR ARTIFICIAL SWEETNERS	ADDED SUGAR OR ARTIFICIAL SWEETNERS
FAT	HEALTHY FATS	POOR-QUALITY FATS	EXCESS FATS AND/OR TRANS FAT FRIED FOODS

Saturated Fats

The 2015–2020 Dietary Guidelines for Americans emphasize limiting saturated fats to less than 10% of daily calories[2]. Encouraging the consumption of natural oils from plants (for example, canola, olive, and safflower), nuts, seeds, seafood, olives, and avocados promotes monounsaturated and polyunsaturated fatty acids over saturated and trans fat. G4G Criteria reflect this nutritional goal.

Trans Fats

Given the evidence-based link between trans fats and cardiovascular risk, the 2015–2020 Dietary Guidelines for Americans recommends limiting trans-fat consumption to a minimum[2]. Despite a decrease in use, artificial trans fats from partially hydrogenated oils are still found in some margarines and packaged foods. Naturally occurring trans fats are found in small amounts in dairy and meat and do not need to be entirely avoided.

G4G Criteria support limiting trans-fat consumption by coding all packaged foods, ready-to-eat items, and recipes containing ingredients with artificial trans fats as Red. The absence of trans fats will be determined by the ingredients list for products showing zero grams of trans fats on the Nutrition Facts panel. In addition, all deep-fried foods, including those that are pre-deep fried and heated in an oven, such as French fries, are automatically coded Red.

Fiber

The Institute of Medicine recommends women 50 and younger consume 25 grams of fiber and men 50 and younger consume 38 grams of fiber per day[9]. Food-labeling guidelines indicate that "good" sources of fiber must contain ≥2.5 grams (or 10% of the recommended daily value of 25 grams) and "high-fiber" sources must contain ≥5 grams (or 20% of the recommended daily value of 25 grams)[10]. These calculations are based on recommendations for women. To account for the recommended 38 grams per day for men, "good" sources of fiber would contain ≥3.8 grams and "high-fiber" sources would contain ≥7.6 grams. G4G Criteria use an adaptation of the official fiber recommendations and FDA food-labeling guidelines. The criteria for "good" sources of fiber at 3–6 grams and "high-fiber" sources at >6 grams align with the Institute of Medicine's recommendations for men and women.

FDA has proposed a new dietary fiber definition that includes "added (isolated or synthetic) non-digestible carbohydrates (≥3 monomeric units) that FDA has determined to have a physiological benefit."[11] G4G Criteria will be updated based on further guidance from FDA regarding added non-digestible carbohydrates, such as inulin, found in packaged foods and not yet proven to be beneficial.

Sugar

The 2015–2020 Dietary Guidelines for Americans recommends a daily maximum consumption of 10% of calories from added sugar[2]. Current information about added sugar is either limited or unavailable for most foods and beverages; therefore, the following approach uses total sugar (grams) to approximate the recommendation based on added sugars. To obtain sugar recommendations, G4G nutrition experts applied the 10% maximum recommendation to a 2,800-calorie diet, on which the Basic Daily Food Allowance (BDFA) is based. The recommendation of 70 grams of added sugar as the daily maximum was doubled to 150 grams to account for naturally occurring sugars. To translate this recommendation into G4G Criteria, G4G nutrition experts conducted a detailed review of food categories where the presence of sugar would be expected (for example, beverages, desserts, yogurts, and sauces) and identified low, moderate, and high levels of total sugar per category.

When the new Nutrition Facts panel includes "Added Sugars" on packaged products beginning in 2018[12], the G4G evaluation criteria will be revised: Products and recipes will be evaluated based on "added sugars" instead of "total sugars."

Non-nutritive Sweeteners

Non-nutritive sweeteners are a popular replacement for the calories from added sugar found in beverages, yogurts, and desserts. However, the research is inconclusive about their effectiveness for long-term weight management[2]. Given non-nutritive sweeteners have not been found to be healthful or provide any nutritional value, beverages (that is, "diet" drinks) and foods containing non-nutritive sweeteners do not meet the G4G Criteria to qualify as Green-coded choices. These will code Yellow, at most.

Total Fat

Nutrition recommendations have shifted focus from percentage of calories from total fat to the types of fat. "Calories from fat" was removed from the updated Nutrition Facts panel to reflect new scientific information that shows the type of fat is more important to health than the amount of fat[12]. The benefits of the Mediterranean Diet—which is high in unsaturated fats from olive oil, nuts, and seeds—are well documented. Research has shown the benefits of the Mediterranean-style eating pattern on cardiovascular risk factors, which experts attribute to the combination of high-unsaturated-fat and low-saturated-fat content[13].

G4G Criteria reflect the updated research and recommendations on total fat by focusing on the types of fat. This allows for highly nutritious foods such as nuts, seeds, avocadoes, and healthful oils—which would be coded Red based on their percentages of calories from fat—to be coded Green instead.

Processing

Recommendations in the 2015–2020 Dietary Guidelines for Americans move away from an emphasis on individual nutrients and foods and instead focus on a healthy-eating pattern by encouraging the consumption of nutrient-dense foods and beverages across and within all food groups[2]. Recipes made with minimally processed or mostly whole-food ingredients such as fruits, vegetables, whole grains, seafood, lean meats and poultry, eggs, legumes, nuts, seeds, and oils contribute to a healthy eating pattern. Processing ingredients—such as with refined grains, meats/poultry, and processed packaged foods—might remove healthy nutrients, such as key vitamins or fiber, and add undesirable components such as saturated or trans fats.

G4G Criteria mirror the 2015–2020 Dietary Guidelines for Americans by coding minimally processed foods Green to encourage their intake. Moderately processed packaged foods and ingredients tend to be coded Yellow, while highly processed packaged foods and ingredients code Red.

Monosodium Glutamate

Monosodium glutamate (MSG) occurs naturally in many foods and is also a popular food additive due to its flavor enhancing properties. According to DoD Manual 1338.10 section 10b, "Products containing monosodium glutamate as an ingredient must be avoided."[6]

Caffeine

Research has shown that caffeine use is associated with increased alertness and enhanced physical performance[14]. Moderate caffeine use is generally safe. However, there is a wide range of individual response to caffeine (that is, caffeine sensitivity) affected by factors including genetics, stimulant or drug use, stress, and relevant health conditions[14]. Given these findings, G4G Criteria do not incorporate caffeine level into coding for food and beverages, but encourage Service Members to be mindful of their caffeine consumption through G4G educational material and resources such as Operation Supplement Safety. Unsweetened teas and coffees fall into the Green category. As beverages combine caffeine along with added sugar or high saturated-fat ingredients, they tend to code as Yellow or Red.

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G4G Coding Calculator

Color Code

Nutrition Component	Value	Scoring
Preparation	Is the cooking method deep-frying?	☐ Yes * Items are automatically marked Red if this answer is "yes"
Trans Fat	Does the product contain "partially hydrogenated" fat/oil (trans fat)?	☐ Yes * Items are automatically marked Red if this answer is "yes"
Additives	Does the product contain added monosodium glutamate (MSG)?	☐ Yes * Items are automatically marked Red if this answer is "yes"
Total Calories	Enter total number of calories This is used to determine the percentage of total and saturated fat only.	cal
% of calories from saturated fat	How many grams of SATURATED fat? or What % of calories are from SATURATED fat?	g or %
% of calories from total fat	How many grams of TOTAL fat? or What % of calories are from TOTAL fat?	g or %
Fiber	Grams of fiber per serving	g
Sugar	Grams of total sugar per serving	g
Processing	How processed are the ingredients in the product? Mostly:	○ Whole foods ○ Lightly processed ○ Moderate to highly processed

Results

Green
9-13 Points

Yellow
5-8 Points

Red
<5 Points

Current Score: 0

Sodium Code

Type of Food	Select type of food from list Note: beverages and fruits will not be labled for sodium	-- Choose One --
Mg of Sodium	Enter total mg of sodium per serving	mg

Results

select type of food

High:

Moderate:

Low:

Final Score:

Go for Green® Coding Algorithm

Color Code			
Nutrition Component	**Value**	**Possible Points**	**Points**
Preparation	Is the cooking method of the product deep-frying?	Stop here: Automatically Red	
Trans Fat	Does the product contain "partially hydrogenated" fat/oil (trans fat)?	Stop here: Automatically Red	
Additives	Does the product contain added monosodium glutamate (MSG)?	Stop here: Automatically Red	
% of calories from saturated fat	Calculate % of calories from SATURATED fat or use nutrient analysis	≤ 10% sat fat = 2 11–15% sat fat = 1 ≥ 16% sat fat = 0	
% of calories from total fat	Calculate % of calories from TOTAL fat * Total fat may be higher than 30% and still score 2 points for select items if the saturated fat is ≤ 10%. Items that may qualify for this exception include salmon and salad dressings or condiments made with heart-healthy fats.	≤ 30% total fat* = 2 31–49% total fat = 1 ≥ 50% total fat = 0	
Fiber	Grams of fiber per serving	> 6 grams = 3 4–6 grams = 2 2–3.9 grams = 1 < 2 grams = 0	
Sugar	Grams of total sugar per serving	< 12 grams of sugar = 3 12–18 grams of sugar = 1 > 18 grams of sugar = 0	

Color Code			
Nutrition Component	**Value**	**Possible Points**	**Points**
Processing ► Processing that minimally affects nutritional value = canning, dehydrating, freezing, etc. What is added during processing may be unhealthy, but the processes themselves are not harmful ► Processing that affects nutritional value = processes/ingredients where nutrients have been stripped away and/or artificial flavors and/or colors have been added; curing	How processed are the ingredients in the product? Mostly: ► Whole-food ingredients: fresh or frozen vegetables, fresh fruits, nuts, seeds, whole grains, unprocessed meat, poultry, and seafood, canned tomatoes and beans, plain dairy products ► Some processed ingredients: canned plain vegetables, canned fruits in juice or water, dehydrated fruits or vegetables, canned soups, meat or poultry injected with solution, uncured deli meats ► Moderately to highly processed and/or refined ingredients: refined (white) grains (for example, white bread, rice, and pasta), canned fruits or vegetables with added saturated fat and/or low to moderate amounts of added sugar, nitrates/nitrites, artificial flavors, non-nutritive sweeteners: Acesulfame potassium ("Sunett" or "Sweet One"), Aspartame ("Equal" or "NutraSweet"), Neotame, Saccharin ("Sweet'N Low"), Sucralose ("Splenda"), Truvia, Stevia	Mostly whole-food ingredients = 3 Lightly processed, but still of moderate nutritional value = 1 Moderately to highly processed and/or refined ingredients = 0	
		Total Points	
Scoring (total points)		**Green = 9–13** **Yellow = 5–8** **Red = < 5**	

Sodium Code
Reference Sodium Criteria table to identify appropriate Low-, Moderate-, or High-sodium code.
Category Name:
Sodium Code:

Sodium Table‡

Sodium is part of the Go For Green® initiative. Sodium levels of foods are labeled by the Low, Moderate, or High salt-shaker symbols shown below.

The sodium code works together with the Green, Yellow, and Red code to help diners choose foods that are acceptable for them. Sodium needs vary from person to person, depending on activity level and health concerns.

Sodium Content	 LOW	 MODERATE	 HIGH
Full-plate Meal*	< 800 mg	800–1500 mg	>1500 mg
Entrée** Protein, vegetables, starch	< 650 mg	650–1100 mg	>1100 mg
Entrée** Protein and vegetables	< 450 mg	450–800 mg	> 800 mg
Entrée** Protein and starch (carb)	< 600 mg	600–950 mg	> 950 mg
Protein only	< 350 mg	350–800 mg	> 800 mg
Grains & Other Starches	< 300 mg	300–700 mg	> 700 mg
Vegetables	< 150 mg	150–400 mg	> 400 mg
Soup	< 450 mg	450–600 mg	> 600 mg
Dairy	< 150 mg	150–300 mg	> 300 mg
Condiments, Gravies	< 200 mg	200–300 mg	> 300 mg
Dessert	< 300 mg	300–600 mg	> 600 mg
Beverages	Will not be labeled for sodium		
Fruits	Will not be labeled for sodium		

‡ Sodium values will be revised at three-year intervals, as more reduced-sodium products and recipes become available.

** Full-plate meal includes fruit and dairy.*

*** Entrees exclude fruit and dairy.*

Go for Green® Coding Algorithm: Beverage Table

The Go for Green® Coding Algorithm (web-based or handwritten) shouldn't be used to code beverages. Instead, use the following coding table. Beverages are coded based on added sugar content, artificial ingredients, saturated fat content, and healthful nutrients such as vitamins and minerals. Provide G4G educational materials to Service Members to help them make informed choices too.

Code	Beverages
	► Water (plain or carbonated) ► Naturally flavored water, including fruit/vegetable/herb-infused (no artificial sweeteners) ► Herbal tea ► Unsweetened iced or hot tea ► Unsweetened iced or hot coffee ► 100% vegetable juice ► Milk, unsweetened (skim, 1%) ► Milk alternatives: soy, almond, rice, unsweetened or plain with added calcium and vitamin D
	► Sports drinks ► 100% fruit juice ► Lightly sweetened iced or hot tea ► Coffee with small amounts of sugar, cream, or milk ► Artificially sweetened beverages (diet or light sodas, tea, juices, and many flavored waters) ► Milk, unsweetened (2%) ► Flavored milk (skim, 1%, 2%) (vanilla, chocolate, etc.) Flavored milk alternatives: coconut, soy, almond, and rice ► Hot chocolate made with water or milk (skim, 1%, 2%)
	► Energy drinks ► Sweet tea ► Coffee with large amounts of whole milk or cream and sugars or syrups ► Sweetened beverages of any kind (sodas, fruit punches, and juice drinks) ► Milk, plain or flavored (whole) ► Hot chocolate made with whole milk, cream, or half-and-half

NOTE: Use the point-based approach (pages 28 and 29 of this document).

G4G Menu Coding Goals

These Menu Coding Goals are intended to define—for dining facilities and galleys—what will qualify as menus compliant with Go for Green® 2.0. The overall goal is to shift menu design away from an overabundance of Red-coded items towards more Green-coded items. In general, there should always be a Green-coded option for each meal part (entrée, starchy side, non-starchy side, etc.) at each station (Main line, Short Order, specialty bar, etc.) for each meal served daily.

The goals are designed around an average-size facility. The size of your foodservice operation—particularly small or exceptionally large—might impact how these goals are applied. For example, in very small facilities where only one entrée is offered on the Main line and one on the Short Order at lunch, the goal might be that only one of those can be a Red-coded entrée and the other should be a Green-coded entrée. For an exceptionally large facility where there might be four or more entrées on the Main line, at least one must be a Green-coded entrée and no more than one Red-coded entrée on each line. This leaves options for additional Green- and/or Yellow-coded entrées. The goals are presented both by meal and by overall menu for two different ways to assess your menus.

Guideline Cards are available for various types of specialty bars and other areas within the dining facility, including Breakfast, Dessert Bar, and Beverage Bar. Refer to these **Guideline Cards** for specific guidance on how to give your dining facility a performance-boosting makeover!

Go for Green® Menu Coding Goals: Breakfast

Menu Coding Goals for Breakfast are presented separately from those for Lunch and Dinner. As more Green- and Yellow-coded breakfast recipes become available, more Green- and Yellow-coded items should be offered. Over time, Menu Coding Goals (percentage of Green-coded items) will be the same for Breakfast as for Lunch and Dinner.

Dining Facility/Galley Serving Line Component	Green-coded Items in Overall Menu	Green-coded Items per Meal	Red-coded Items per Meal
Main/Hotline Entrées	At least 30%	At least 1	—
Main/Hotline Starchy Sides	At least 30%	At least 1 (every other day)	—
Main/Hotline Non-Starchy Sides	At least 30%	At least 1	—
Grill/Short-Order Entrées: Omelet Station Breakfast Entrees (where applicable)	At least 30%	At least 1 (omelet or entrée) At least 4 omelet toppings/fillings	—
Grill/Short-Order Sides	At least 30%	At least 1	—
Breakfast/Fitness Bar	At least 30%	At least 6	No more than 3
Cereals, Cold	At least 30%	At least 2	No more than 2
Cereals, Hot	At least 30%	At least 1	–
Beverages	At least 30%	At least 1	—
Smoothies (if offered)	At least 30%	—	—

Go for Green® Menu Coding Goals: Lunch and Dinner

Separate Menu Coding Goals are included for Breakfast vs. Lunch and Dinner. At present, an insufficient number of Green-coded recipes are available for Breakfast. As more Green- and Yellow-coded breakfast recipes become available, more Green- and Yellow-coded items should be offered. Over time, Menu Coding Goals (percentage of Green-coded items) will be the same for Breakfast as for Lunch and Dinner.

Dining Facility/Galley Serving Line Component	Green-coded Items in Overall Menu	Green-coded Items per Meal	Red-coded Items per Meal
Main/Hotline Entrées	At least 30%	At least 1	No more than 1
Main/Hotline Starchy Sides	At least 30%	At least 1	No more than 1
Main/Hotline Non-Starchy Sides	At least 30%	At least 1	No more than 1
Grill/Short-Order Entrées	At least 30%	At least 1	No more than 50%
Grill/Short-Order Sides	At least 30%	At least 1	No more than 2
Sandwich Line (Cold) (featured)	At least 30%	At least 2	—
Salad Bar (excluding dressings)	At least 50%	Unlimited	No more than 3–5 toppings on the bar
Legumes	At least 30%	Unlimited	—
Desserts	At least 30%	Unlimited	—
Beverages	At least 30%	—	—
Dressings	At least 30%	At least 3	No more than 3
Chips/Portable Snacks/ Sides	At least 30%	Unlimited	—
Specialty Bars (Pizza, Potato, Taco, Chicken, etc.)	At least 30%	At least one entrée and one side	—

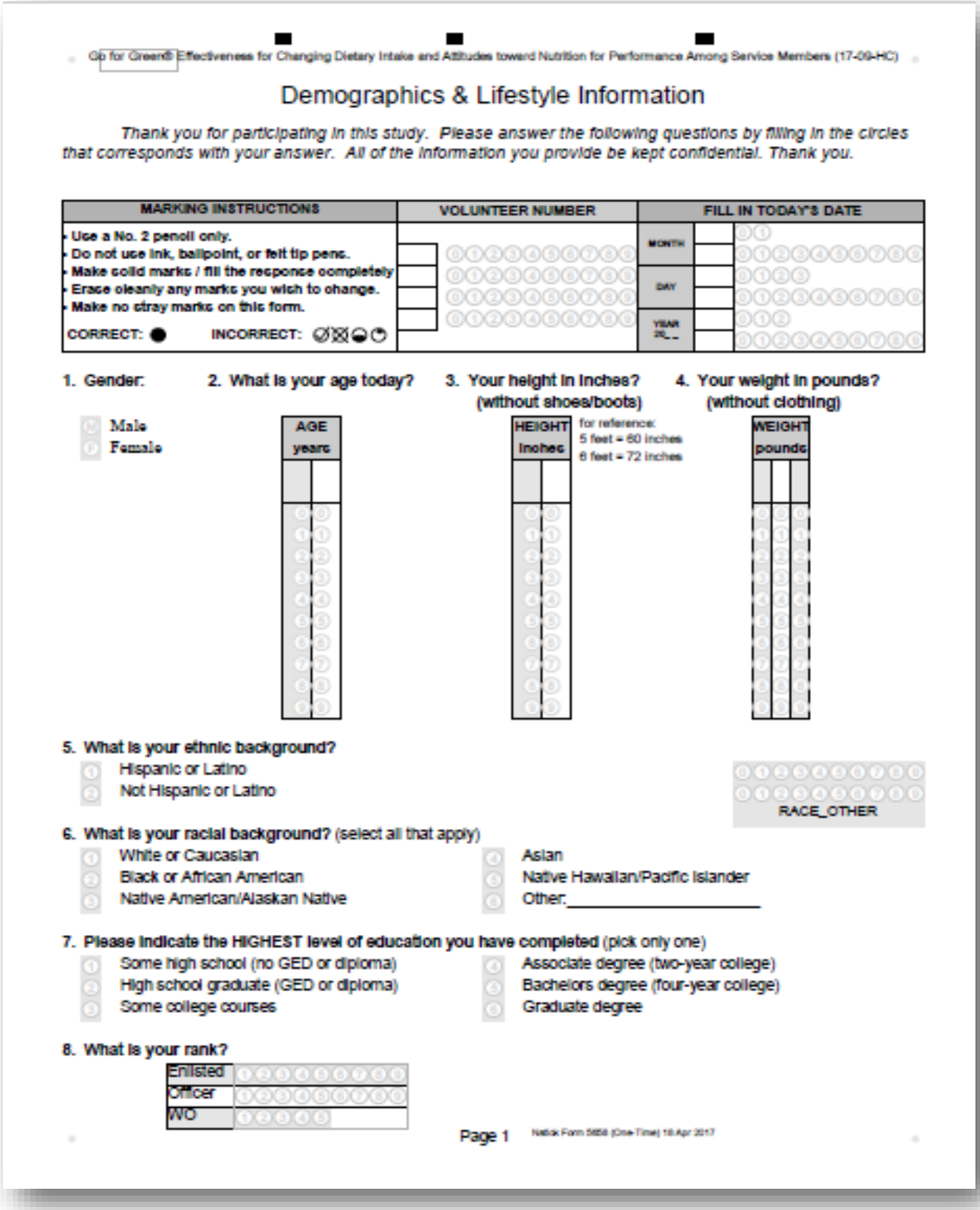
G4G Food-placement Goals

For each serving area, implement at least 3 food-placement goals.

Bar/Station	Food-placement Goals
Hotline/Main Line	Place Green-coded items first, followed by Yellow-coded ones, and then Red-coded items
	Offer 2 non-starchy vegetables
	Offer whole-grain versions of starches and place first in line
	Examples: brown rice, whole-wheat pasta
	Offer Red-coded sauces on the side, at the end of the line
Short Order/Grill	Place Green-coded items first, followed by Yellow-coded ones, and then Red-coded items
	Make whole-grain bread, wraps, and pita the default
	Place white bread, rolls, wraps, and pita out of sight
	Offer 4 vegetables as burger or sandwich toppings
	Offer only one fried starch (French fries or onion rings)
	Offer grilled chicken
	Offer veggie burgers
	Offer baked fries instead of deep-fried ones
Deli/Sandwich Bar	Place Green-coded items first, followed by Yellow-coded ones, and then Red-coded items
	Make whole-grain bread, wraps, and pita the default
	Place white bread, rolls, wraps, and pita out of sight, such as under the counter
	If offering pre-made sandwiches, place Green-coded options at or above eye level
	Offer Green-coded spreads such as hummus or guacamole; place before Red-coded options such as mayonnaise or creamy dressings
	Offer at least 6 vegetables as sandwich toppings
	Place Red-coded toppings in smaller containers at the end of the line
	Offer meatless options such as Portobello mushrooms or marinated tofu

Bar/Station	Food-placement Goals
Salad Bar	Offer at least 10 Green-coded vegetables
	Offer whole-grain starchy salads (for example, those made with brown rice or quinoa)
	Offer Green-coded dressings such as olive oil and homemade vinaigrettes; place before Red-coded options
	Offer Green-coded fats such as nuts, seeds, or avocados; place before Red-coded options
	Place Red-coded toppings in smaller containers at the end of the line
	Make whole-grain bread, wraps, and pita the default
	Place white bread and pita out of sight, such as under the bar
Specialty Bar	Place Green-coded items first, followed by Yellow-coded ones, and then Red-coded items
	Offer at least 4 vegetables
	Offer meatless options such as Portobello mushrooms, beans, or marinated tofu
	Place Red-coded toppings in smaller containers at the end of the line
	Offer Green-coded fats such as nuts, seeds, or avocadoes; place before Red-coded options
	Offer whole-grain versions of starches and place first in line *Examples:* brown rice, whole-wheat pasta
Dessert Bar	Offer fruit, whole or cut-up
	Place Dessert Bar out of the main traffic flow
	Decrease the physical space of the Dessert Bar
	Offer fruit-and-yogurt parfaits
	Offer more Yellow-coded options than Red-coded ones
Beverages	Offer infused or "spa" water
	Serve water in multiple places
	Assign water its own full fountain tab on the drink machine
	Offer unsweetened tea, and place in line before sweet tea
	Add lemon slices to water or unsweetened tea
	Move Red-coded beverages to the end of the station
	Place low-fat and plain milks before flavored (chocolate) milk
	Offer 100% juice rather than juice drinks or fruit punches

Appendix B: Demographic & Lifestyle Survey



Go for Green® Effectiveness for Changing Dietary Intake and Attitudes toward Nutrition for Performance Among Service Members (17-09-HC)

Demographics & Lifestyle Information

Thank you for participating in this study. Please answer the following questions by filling in the circles that corresponds with your answer. All of the information you provide be kept confidential. Thank you.

MARKING INSTRUCTIONS	VOLUNTEER NUMBER	FILL IN TODAY'S DATE
• Use a No. 2 pencil only. • Do not use ink, ballpoint, or felt tip pens. • Make solid marks / fill the response completely • Erase cleanly any marks you wish to change. • Make no stray marks on this form. CORRECT: ● INCORRECT: ∅ ⊠ ◒ ◔		MONTH DAY YEAR 20__

1. Gender:
   - (M) Male
   - (F) Female

2. What is your age today?
   AGE years

3. Your height in inches? (without shoes/boots)
   HEIGHT inches
   for reference:
   5 feet = 60 inches
   6 feet = 72 inches

4. Your weight in pounds? (without clothing)
   WEIGHT pounds

5. What is your ethnic background?
   - (1) Hispanic or Latino
   - (2) Not Hispanic or Latino

   RACE_OTHER

6. What is your racial background? (select all that apply)
   - (1) White or Caucasian
   - (2) Black or African American
   - (3) Native American/Alaskan Native
   - (4) Asian
   - (5) Native Hawaiian/Pacific Islander
   - (6) Other:_____

7. Please indicate the HIGHEST level of education you have completed (pick only one)
   - (1) Some high school (no GED or diploma)
   - (2) High school graduate (GED or diploma)
   - (3) Some college courses
   - (4) Associate degree (two-year college)
   - (5) Bachelors degree (four-year college)
   - (6) Graduate degree

8. What is your rank?
   - Enlisted
   - Officer
   - WO

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9. What is your primary MOS? Description:_____

10. How long have you been in the Armed Services?

Active Duty	1 Less than one year	OR	If a year or more, please fill in the number of years (start with leading zero's when needed).	

11. During the past 7 days, which meals and snacks did you eat on a regular basis (at least 5 times per week)?
Please fill in one response for each line:

Yes	No	
Y	N	A. Early morning snack
Y	N	B. Breakfast
Y	N	C. Morning snack
Y	N	D. Lunch
Y	N	E. Afternoon snack
Y	N	F. Dinner
Y	N	G. Evening snack

12. During the past 7 days, where did *MOST* of your meals and snacks come from? Select ONLY ONE choice for each meal and snack.

	Do not eat a meal/snack at this time	Home / Barracks (current residence)	Military dining facility	Restaurants / Dine in	Restaurants / Take-out	Convenient stores / PX / Shoppette	Other _____
Early Morning Snack	0	1	2	3	4	5	6
Breakfast	0	1	2	3	4	5	6
Morning Snack	0	1	2	3	4	5	6
Lunch	0	1	2	3	4	5	6
Afternoon Snack	0	1	2	3	4	5	6
Dinner	0	1	2	3	4	5	6
Evening Snack	0	1	2	3	4	5	6

Q12_oth

For questions 13-16, during the last 7 days, think about only those physical activities that you did continuously for at least 10 minutes at a time. On how many days did you do each type of activity and on the average, for how long?

13. VIGOROUS physical activity

(makes you breathe much harder than usual with heavy sweating; e.g. lifting weights, aerobics, or fast running / bicycling)?

Number of days per week ○○○○○○○ X

TIME per day	
Hr.	Min.
0 0	0 0
1 1	1 1
2 2	2 2
3 3	3 3
4 4	4 4
5 5	5 5
6 6	
7 7	
8 8	
9 9	

14. MODERATE physical activity

(makes you breathe somewhat harder than usual; e.g. jogging, carrying light loads, or bicycling at a regular pace)?

Number of days per week ○○○○○○○ X

TIME per day	
Hr.	Min.
0 0	0 0
1 1	1 1
2 2	2 2
3 3	3 3
4 4	4 4
5 5	5 5
6 6	
7 7	
8 8	
9 9	

15. WALK for at least 10 minutes at a time?

This includes walking at work and at home, walking to travel from place to place, and other walking that you did solely for recreation, sport, exercise or leisure.

Number of days per week ○○○○○○○ X

TIME per day	
Hr.	Min.
0 0	0 0
1 1	1 1
2 2	2 2
3 3	3 3
4 4	4 4
5 5	5 5
6 6	
7 7	
8 8	
9 9	

16. How much time in total did you usually spend SITTING on a week day?

This includes while at work or home, while doing course work and during leisure time, sitting at a desk, visiting friends, reading, traveling in a vehicle, and sitting or lying down to watch television.

TIME per day	
Hr.	Min.
0 0	0 0
1 1	1 1
2 2	2 2
3 3	3 3
4 4	4 4
5 5	5 5
6 6	
7 7	
8 8	
9 9	

Use the table below to indicate how many hours during a typical day (24 hrs), during the week and then again during the weekends, you spend engaged in electronic activities.

17. DURING WEEKDAYS							
WATCHING TV		VIDEO GAMES		USING COMPUTER FOR WORK OR SCHOOL		USING COMPUTER FOR LEISURE	
0 0 1 1 2 2 3 3 4 4 5 5 6 6 7 7 8 8 9 9		0 0 1 1 2 2 3 3 4 4 5 5 6 6 7 7 8 8 9 9		0 0 1 1 2 2 3 3 4 4 5 5 6 6 7 7 8 8 9 9		0 0 1 1 2 2 3 3 4 4 5 5 6 6 7 7 8 8 9 9	

18. DURING WEEKEND							
WATCHING TV		VIDEO GAMES		USING COMPUTER FOR WORK OR SCHOOL		USING COMPUTER FOR LEISURE	
0 0 1 1 2 2 3 3 4 4 5 5 6 6 7 7 8 8 9 9		0 0 1 1 2 2 3 3 4 4 5 5 6 6 7 7 8 8 9 9		0 0 1 1 2 2 3 3 4 4 5 5 6 6 7 7 8 8 9 9		0 0 1 1 2 2 3 3 4 4 5 5 6 6 7 7 8 8 9 9	

19. How would you rate your physical readiness for military training or combat at this time?

1. Best physical shape in my life
2. Good physical shape
3. Neither good nor bad physical shape
4. Bad physical shape
5. Worst physical shape in my life

APFT

20. APFT score

0	0	0
1	1	1
2	2	2
3	3	3
4	4	4
5	5	5
6	6	6
7	7	7
8	8	8
9	9	9

21. Number of pushups

0	0	0
1	1	1
2	2	2
3	3	3
4	4	4
5	5	5
6	6	6
7	7	7
8	8	8
9	9	9

22. Number of sit ups

0	0	0
1	1	1
2	2	2
3	3	3
4	4	4
5	5	5
6	6	6
7	7	7
8	8	8
9	9	9

23. 2 MILE RUN TIME

minutes		/ seconds	
		/	
0	0		0
1	1		1
2	2		2
3	3		3
4	4		4
5	5		5
6	6		6
7	7		7
8	8		8
9	9		9

24. Alternate APFT event:

1. Bike
2. Walk
3. Swim
4. Other_____

26. DATE OF LAST APFT		
MONTH		0 1 0 1 2 3 4 5 6 7 8 9
DAY		0 1 2 3 0 1 2 3 4 5 6 7 8 9
YEAR 20__		0 1 2 0 1 2 3 4 5 6 7 8 9

SLEEP

26. During the last 7 days, how would you rate your sleepiness during the day?

1. Feeling active, vital, alert, or wide awake
2. Functioning at high level, but not at peak; able to concentrate
3. Awake but relaxed; responsive but not fully alert
4. Somewhat foggy; let down
5. Foggy; losing interest in remaining awake; slowed down
6. Sleepy, woozy, fighting sleep; prefer to lie down
7. No longer fighting sleep, sleep onset soon; having dream-like thoughts

27. During the last 7 days, on average how many hours of sleep did you get in a 24-hour period? *(to nearest ½ hr)*

Hours per day	
Hr.	Min.
00	00
01	01
02	02
03	03
04	04
05	05
06	06
07	07
08	08
09	09
10	10
11	11
12	12
13	13
14	14
15	15
16	16
17	17
18	18
19	19
20	20
21	21
22	22
23	23
24	24

PERFORMANCE

28. During the last 7 days, did your food choices in the dining facility have an effect on:

	NEVER	SOMETIMES	MOST OF THE TIME	ALWAYS
Feeling energized throughout the day?	1	2	3	4
Improving your mood during the day?	1	2	3	4
Feeling satisfied for several hours after meals (not over hungry nor over full)?	1	2	3	4
Improving your mental performance (e.g. ability to think clearly, focus, learn, and ability to recall information during the day)?	1	2	3	4
Improving your level of physical performance (e.g. during workout or military training)?	1	2	3	4
Improving your ability to sustain physical performance longer?	1	2	3	4
Feeling good about yourself?	1	2	3	4
Improving your recovery after a vigorous physical activity OR workout? *(recovery refers to how quickly your muscles and cardiovascular systems rebound after a workout or physical activity)*	1	2	3	4
Improving your recovery after a moderate physical activity OR workout? *(recovery refers to how quickly your your muscles and cardiovascular systems rebound after a workout or physical activity)*	1	2	3	4
Reducing injury?	1	2	3	4
Improving your sleep quality?	1	2	3	4
Improving your response to emotional or psychological stress?	1	2	3	4

Appendix C: Dining Facility Satisfaction Survey

Go for Green® Effectiveness for Changing Dietary Intake and Attitudes toward Nutrition for Performance Among Service Members (17-09-HC)

Dining Facility Satisfaction Survey

MARKING INSTRUCTIONS	VOLUNTEER NUMBER	FILL IN TODAY'S DATE
• Use a No. 2 pencil only. • Do not use ink, ballpoint, or felt tip pens. • Make solid marks / fill the response completely • Erase cleanly any marks you wish to change. • Make no stray marks on this form. CORRECT: ● INCORRECT: ⊘ ⊗ ◒ ◔		MONTH, DAY, YEAR 20__

Thank you for participating in this study. Please answer the following questions by filling in the circles that reflect your experience with the food service. All of the information you provide be kept confidential. Thank you.

Complete by marking the boxes that reflect your experience with our Food service.

		STRONGLY AGREE	MODERATELY AGREE	AGREE	UNDECIDED	DISAGREE	MODERATELY DISAGREE	STRONGLY DISAGREE
1.	Appearance of the food is pleasing	1	2	3	4	5	6	7
2.	Flavor and taste of the food is good	1	2	3	4	5	6	7
3.	Choices available are adequate	1	2	3	4	5	6	7
4.	Availability of healthy foods is adequate	1	2	3	4	5	6	7
5.	Availability of performance foods is adequate	1	2	3	4	5	6	7
6.	Portion sizes are appropriate	1	2	3	4	5	6	7
7.	Availability of fresh fruit is adequate	1	2	3	4	5	6	7
8.	The salad bar offers a variety of fresh vegetables	1	2	3	4	5	6	7
9.	The main dishes served are healthy and performance-based	1	2	3	4	5	6	7
10.	The side dishes are served without added fat (ex: butter)	1	2	3	4	5	6	7
11.	Healthy and performance-based dessert choices are available	1	2	3	4	5	6	7
12.	Temperature of food (ex: hot food is hot) is just right	1	2	3	4	5	6	7
13.	Vegetarian food choices are available	1	2	3	4	5	6	7
14.	I find the DFAC nutrition labels easy to use	1	2	3	4	5	6	7
15.	Nutrition labels provide knowledge to make performance based choices	1	2	3	4	5	6	7
16.	I use the DFAC nutrition labels to chose healthy foods	1	2	3	4	5	6	7
17.	I use the DFAC nutrition labels to chose performance foods	1	2	3	4	5	6	7

18. How long have you been eating at this dining facility *(i.e., years/months OR weeks)*? *Please use leading zeros when needed. If you are not reporting in a row, please fill in a zero.*

YEARS	
MONTH	
-OR-	
WEEKS	

Natick Form 5667 (One-Time) 18 Apr 2017

Appendix D: Nutrition Knowledge Survey

Go for Green® Effectiveness for Changing Dietary Intake and Attitudes toward Nutrition for Performance Among Service Members (17-09-HC)

Nutrition Knowledge

Thank you for participating in this study. Please answer the following questions by filling in the circles that corresponds with your answer. All of the information you provide will be kept confidential. Thank you.

MARKING INSTRUCTIONS	VOLUNTEER NUMBER	FILL IN TODAY'S DATE
• Use a No. 2 pencil only. • Do not use ink, ballpoint, or felt tip pens. • Make solid marks / fill the response completely • Erase cleanly any marks you wish to change. • Make no stray marks on this form. CORRECT: ● INCORRECT: ⊘ ⊠ ◒ ◔		MONTH DAY YEAR 20__

This section is intended to assess your general knowledge about nutrition:

First tell us if each statement is TRUE or FALSE, then tell us if you are confident with your answer (YES), or not confident in your answer (NO).

This section is intended to assess your general knowledge about nutrition:
First tell us if each statement is TRUE or FALSE, then tell us if you are confident with your answer (YES), or not confident in your answer (NO).

		TRUE	FALSE	Are you confident with your answer? YES	NO
1.	Dietary supplements are regulated by the government for purity *(cleanliness)* and safety before sale.	T	F	Y	N
2.	Feeling fatigued midway through a workout may be a sign of insufficient carbohydrate calories in your diet.	T	F	Y	N
3.	Protein helps to build and repair muscle.	T	F	Y	N
4.	Replacing lost body weight from an exercise session with fluid is important.	T	F	Y	N
5.	Protein, carbohydrate, and fat all provide the same amount of calories per gram.	T	F	Y	N
6.	Vitamin D helps your body better absorb calcium for bone health.	T	F	Y	N
7.	Common foods that are low in saturated fat include cheese, pizza, and fried chicken breast.	T	F	Y	N
8.	Weight loss occurs from eating fewer calories, burning more calories, or both.	T	F	Y	N
9.	Thirst sensation during or after exercise is an indicator that your body is already dehydrated.	T	F	Y	N
10.	As long as I am physically active and not overweight, I can eat whatever I want and be healthy.	T	F	Y	N
11.	Good sources of calcium include bread, steak, and corn.	T	F	Y	N
12.	Most plants, fish, nuts and seeds are sources of healthy unsaturated fats.	T	F	Y	N
13.	Iron deficiency can cause mental and physical fatigue.	T	F	Y	N
14.	Military personnel should avoid carbohydrates in their diet.	T	F	Y	N
15.	Whole milk is a better source of protein than 2% or skim milk.	T	F	Y	N
16.	A recovery beverage or snack should always be consumed after exercise.	T	F	Y	N
17.	Military personnel who are vegetarian need to consume a daily protein supplement because they cannot get enough protein from their diet.	T	F	Y	N
18.	Vitamins and minerals are sources of calories.	T	F	Y	N
19.	A fluid deficit can lead to an electrolyte imbalance that is not easily overcome by simple rehydration.	T	F	Y	N

Natick Form 9654 (One-Time) 18 Apr 2017

First tell us if each statement is TRUE or FALSE, then tell us if you are confident with your answer (YES), or not confident in your answer (NO).

		TRUE	FALSE	Are you confident with your answer? YES	NO
20.	Dietary fat is not considered an important part of a balanced diet.	○	○	○	○
21.	Protein is the most important source of energy *(calories)* for physical activity.	○	○	○	○
22.	Men need more iron than women.	○	○	○	○
23.	At least half of the food on your plate should be fruits and vegetables.	○	○	○	○
24.	Most military personnel require about four times more protein than civilians.	○	○	○	○
25.	Meat is a good source of fiber.	○	○	○	○
26.	Vitamin E is important for turning the food you eat into energy.	○	○	○	○
27.	Carbohydrates are the main fuel for mental performance.	○	○	○	○
28.	As long as enough calories are consumed, vitamin and mineral needs of military personnel are met.	○	○	○	○
29.	Fiber is important for regular bowel movements.	○	○	○	○
30.	Sports drinks are always the preferred beverage when exercising at moderate intensity.	○	○	○	○
31.	Common carbohydrate-rich foods are pasta, potato, cereal and bread.	○	○	○	○
32.	Iron is found in dark green vegetables, eggs, and fortified cereal.	○	○	○	○
33.	Carbohydrates *(stored as muscle glycogen)* are the most important energy source for high-intensity activity.	○	○	○	○
34.	To lose weight, recommendations say that skipping meals is best.	○	○	○	○
35.	Good sources of protein include yogurt, black beans and nuts.	○	○	○	○
36.	A healthy person should be able to get all of the vitamins and minerals the body needs from a balance of food choices.	○	○	○	○
37.	Fat is an important source of energy at rest and during long-duration exercise.	○	○	○	○
38.	Eating a poor-quality diet may increase risk for injury or illness in military personnel.	○	○	○	○
39.	Vitamin C is sometimes called the sunshine vitamin because the sun helps your body make it.	○	○	○	○
40.	Consuming more than 2 grams of protein per kg of body weight per day will build muscle.	○	○	○	○

Thank you for taking the time to fill out this survey. Please check over the questions to be sure nothing was missed.

Appendix E: G4G Awareness for Diner

Diners Survey - Patrons

Thank you for participating in this study. Please answer the following questions by filling in the circles that corresponds with your answer. All of the information you provide will be kept confidential. Thank you.

MARKING INSTRUCTIONS	VOLUNTEER NUMBER	FILL IN TODAY'S DATE
• Use a No. 2 pencil only. • Do not use ink, ballpoint, or felt tip pens. • Make solid marks / fill the response completely • Erase cleanly any marks you wish to change. • Make no stray marks on this form. CORRECT: ● INCORRECT: ⊘ ⊠ ◒ ◔		MONTH DAY YEAR 20__

Instructions: For all questions and/or statements presented in this survey, please select only one (1) response unless the question and/or statement indicate otherwise.

1. **Do you believe the foods you eat will impact your physical performance?**
   - Yes
   - No

2. **Do you believe the foods you eat will impact your mental performance?**
   - Yes
   - No

3. **What source do you use the most in helping to understand nutrition?** *(Choose all that apply)*
   - Social media *(Facebook, Twitter, Instagram, etc.)*
   - Health professionals such as Nurses, Physicians or Dietitians
   - Fellow Soldiers
   - Command leadership
   - Family members
   - Blogs
   - Health and fitness magazines
   - Gym/fitness personnel
   - Specialty foods or supplement stores *(GNC, Whole Foods, etc.)*
   - Posted information *(posters, table tents, brochures)*
   - Websites
   - Podcasts
   - Other, please specify_____

4. **Have you received any military or civilian education on nutrition, not including any Go for Green trainings?**
   - Yes
   - No (skip to question 5)

   If you selected *YES*, how many hours of nutrition training have you received?
   - 1-2 hours
   - 3-5 hours
   - 6-8 hours
   - 9 hours or more

Natick Form 3952 (One-Time) 18 Apr 2017

5. **How would describe your overall nutritional knowledge?**

① Extremely knowledgeable
② Very knowledgeable
③ Somewhat knowledgeable
④ Not knowledgeable

6. **Which of the logos are you familiar with?**

① ② Both ③ Neither ④

7. **If you recognized this logo** 

which of the following statements do you most associate with the logo *(Choose all that apply)?*

Ⓐ Performance focused foods
Ⓑ New menu items
Ⓒ New promotions such as posters, brochures and social media
Ⓓ Food labels
Ⓔ Education
Ⓕ All of the above
Ⓖ None of the above
Ⓗ I do not recognize this logo

8. **From which of the following did you learn about Go for Green®?** *(Choose all that apply)*

YES	Source
①	Print Media *(newspaper, press release, command newsletter, etc.)*
②	Social Media *(Facebook, Twitter, etc.)*
③	Posters
④	Table tents in the dining facility
⑤	Email
⑥	Unit Leadership
⑦	Word of Mouth *(friends, peers, dining facility staff, etc)*
⑧	Other, please specify: _____

9. **Do you use Go for Green® to help make food choices in the dining facility?**

① Yes
② No

10. To what extent do you agree or disagree with the following statements about the Go for Green® initiative.

	STRONGLY DISAGREE	SOMEWHAT DISAGREE	NEITHER AGREE NOR DISAGREE	SOMEWHAT AGREE	STRONGLY AGREE
I find Go for Green® useful	1	2	3	4	5
Go for Green® motivates me to pay attention to what I eat/drink	1	2	3	4	5
I find Go for Green® simple to use	1	2	3	4	5
Go for Green® provides accurate information about food and nutrition	1	2	3	4	5

11. **Do you believe that you have received enough information about the Go for Green® approach to nutrition to help make decisions about what to eat or purchase outside of the dining facility?**
    1. yes
    2. no (skip to question 12)

"If you selected *YES*, where else do you use the Go for Green® guidelines to help make food choices?
- A. Commissary or local grocery store
- B. Restaurants and local eateries
- C. Cooking at home
- D. Other, please specify_____

12. **Go for Green® initiative encourages Soldiers to eat *Green-Coded* items.**
    1. Yes
    2. No

13. **Which of the following is most true about a *Green-coded* food or beverage?** *(Pick one response)*
    1. High in fiber
    2. Low in fiber
    3. Contains artificial sweeteners
    4. Contains trans fat

14. **Using the Go for Green® guidelines which of the following foods or beverages would most likely be *Green-coded*?** *(Pick one response)*
    1. Chocolate milk
    2. Broccoli with cheese sauce
    3. 100% fruit juice
    4. Frozen vegetables

15. **A *Green code* on a food or beverage means which of the following within Go for Green®?** *(Pick one response)*
    1. It must be a green colored food such as dark green leafy vegetables
    2. It must be low in calories
    3. It is the best choice for performance and should be eaten often
    4. All of the above

16. **Which of the following is most true about a *Yellow-coded* food or beverage?** *(Pick one response)*
    1. Nutrient packed whole food
    2. Automatically higher in sodium than Green-coded food or beverage
    3. May contain artificial sweeteners
    4. Mostly processed food, often with multiple unhealthy ingredients

17. **Which of the following is most true about a *Yellow-coded* food or beverage?** *(Pick one response)*
- Low-performance food that should be eaten rarely
- Moderate-performance food that should be eaten occasionally
- High-performance food that should be eaten often
- None of the above

18. **Using the Go for Green® guidelines what type of milk would be considered *Yellow-coded*?** *(Pick one response)*
- Skim, fat-free, or 1% milk
- Chocolate milk (made with skim, fat-free or 1% milk)
- Whole milk
- Half and half

19. **Which of the following is most true about a *Red-coded* food or beverage?** *(Pick one response)*
- Low-performance food that should be eaten rarely
- Moderate-performance food that should be eaten occasionally
- High-performance food that should be eaten often
- None of the above

20. **Which of the following is most true about a *Red-coded* food or beverage?** *(Pick one response)*
- Naturally packed with nutrients
- High in fiber
- Low in sodium
- High in added sugar

21. **Using the Go for Green® guidelines which of the following fruits would most likely be *Red-coded*?** *(Pick one response)*
- Fresh peach
- Sweetened applesauce
- Canned pears in light syrup
- Frozen strawberries without added sugar

22. **How often do you use the Go for Green® Food Card to help you decide what foods you will eat?**
- Never
- Rarely
- Sometimes
- Often
- Always

23. **How often do you use the Go for Green® Beverage Cards to help you decide what beverages you will drink?**
- Never
- Rarely
- Sometimes
- Often
- Always

24. **How helpful/informative are the following Go for Green® materials? Circle a rating of 0-5 with 0 =not helpful/informative at all to 5 = most helpful/informative for <u>each</u> material listed.**

	Have NOT seen	Rate between 0-5: 0 (not helpful/informative) to 5 (most helpful/informative)					
Go for Green® materials	(a)	0	1	2	3	4	5
Food and Beverage Cards in DFAC	(a)	0	1	2	3	4	5
Pamphlets/brochures	(a)	0	1	2	3	4	5
Social media (Facebook, Twitter, etc) post from DFAC	(a)	0	1	2	3	4	5
Social media (Facebook, Twitter, etc) post from Command	(a)	0	1	2	3	4	5
Posters in DFAC	(a)	0	1	2	3	4	5
Table tents DFAC	(a)	0	1	2	3	4	5

25. **From which sources would you <u>*PREFER*</u> to learn about G4G and about Performance Nutrition?**
(Choose all that apply)

(A) Print Media *(newspaper, press release, command newsletter, etc.)*
(B) Social Media *(Facebook, Twitter, etc.)*
(C) Posters
(D) Table tents in the dining facility
(E) Email
(F) Brief/class by Unit Leadership
(G) Informal discussion with Unit Leadership
(H) Brief/class with Performance-focused Dietitian
(I) Word of Mouth *(friends, peers, dining facility staff, etc)*
(J) Other, please specify: _____

26. **Please select how much you agree or disagree with each statement by placing a mark in the corresponding box.**

	STRONGLY DISAGREE	SOMEWHAT DISAGREE	NEITHER AGREE NOR DISAGREE	SOMEWHAT AGREE	STRONGLY AGREE
I'm just not that interested in the information on Go for Green® Food Cards.	1	2	3	4	5
The difference in meaning between the colors on the Go for Green® Food Cards is hard to understand.	1	2	3	4	5
It takes too much time to read the Go for Green® Food Cards.	1	2	3	4	5
I prefer getting nutrition information from other sources besides Go for Green® Food Cards.	1	2	3	4	5
I find the Go for Green® Food Cards easy to use.	1	2	3	4	5
I use the Go for Green® Food Cards to choose healthy foods.	1	2	3	4	5
I use the Go for Green® Food Cards to choose performance food.	1	2	3	4	5
I do not use the Go for Green® Food Cards since I already know which foods to eat.	1	2	3	4	5
I find it easier to choose healthy performance optimizing foods since the revised/rebranded Go for Green® came to the dining facility.	1	2	3	4	5
The name of the food on Food Card does not match the food being served, making it difficult to use.	1	2	3	4	5
I do not trust that the information on the Go for Green® Food Cards is accurate.	1	2	3	4	5
Colored Cards (e.g. Green, Yellow, Red) are more useful than caloric labeling.	1	2	3	4	5
I find the Go for Green® Food Cards useful, when making decisions about what to eat.	1	2	3	4	5
I am learning more about nutrition/fueling for performance through the Go for Green® Food Cards.	1	2	3	4	5

26. Continued: Please select how much you agree or disagree with each statement by placing a mark in the corresponding box.

	STRONGLY DISAGREE	SOMEWHAT DISAGREE	NEITHER AGREE NOR DISAGREE	SOMEWHAT AGREE	STRONGLY AGREE
I am learning more about nutrition/fueling for performance through the Go for Green® posters and table tents.	1	2	3	4	5
I am learning more about nutrition/fueling for performance through the Go for Green® Facebook and Twitter messages.	1	2	3	4	5
I choose more performance based foods since Go for Green® arrived.	1	2	3	4	5
I am NOT learning about nutrition from Go 4 Green®	1	2	3	4	5

27. Have you shared any of the information you learned from the Go for Green® program with others?

- Y Yes
- N No (skip to question 28)

*If you selected *YES*, with whom have you shared the information with?

- A Family members
- B Friends
- C Peers
- D Subordinates
- E Superiors
- F Other, please specify:_____

28. Do you intend to share any of the information you learned from Go for Green® with others?

- Y Yes
- N No (skip to question 29)

*If you selected *YES*, with whom do you intend to share the information with?

- A Family members
- B Friends
- C Peers
- D Subordinates
- E Superiors
- F Other, please specify:_____

29. What are the other ways you would recommend improving the Go for Green® initiative?

_____

_____

_____

Appendix F: G4G Awareness for Staff

Go for Green® Effectiveness for Changing Dietary Intake and Attitudes toward Nutrition for Performance Among Service Members (17-09-HC)

Staff Survey

Thank you for participating in this study. Please answer the following questions by filling in the circles that corresponds with your answer. All of the information you provide will be kept confidential. Thank you.

MARKING INSTRUCTIONS	VOLUNTEER NUMBER	FILL IN TODAY'S DATE
• Use a No. 2 pencil only. • Do not use ink, ballpoint, or felt tip pens. • Make solid marks / fill the response completely • Erase cleanly any marks you wish to change. • Make no stray marks on this form. CORRECT: ● INCORRECT: ⊘⊠◒◔		MONTH, DAY, YEAR

Instructions: For all questions and/or statements presented in this survey, please select only **one (1)** response unless the question and/or statement indicate otherwise.

Participant Demographics

1. **How long have you worked at your current dining facility?**
   - Less than 1 month
   - 1 month to 3 months
   - 4 months to 7 months
   - 8 months but less than 1 year
   - 1 year but less than 3 years
   - 3 or more years

2. **What is your affiliation with this installation?**
   - Civilian Employee
   - Contractor
   - Military Service Member
   - Other, please specify: _____

3. **If you selected <u>Civilian Employee</u> in Question 2, what is your GS grade or equivalent?** (*Please bubble your selection*) If you did not select Civilian Employee in Question 2, please bubble "N/A".

   - OR -

4. **If you selected <u>Military Service Member</u> in Question 2, what is your rank?** (*Please bubble your selection*) If you did not select Service Member in Question 2, please bubble "N/A".

Enlisted	
Officer	
WO	

- OR -

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5. **What is your current job title at this dining facility?**
   1. Food Program Advisor
   2. Dining Facility Manager
   3. NCOIC
   4. Shift leader/ supervisor
   5. 92G *(Non-Supervisor)*
   6. Administrative
   7. Other *(please specify)*:_____

6. **In the last 6 months, did you attend any staff training sessions on G4G** *(or key G4G concepts not limited to food placement and maintaining food cards)*?
   1. Yes*
   2. No *(skip to question 7)*
   3. Unsure/Cannot remember

*If you chose ***YES***, how many G4G staff training modules *(15-30 minutes each)* have you participated in?

1 2 3 4 5 6 7 8 9

Participant Knowledge of G4G program

Select a one response for your level of agreement with the following statements:

	STRONGLY DISAGREE	DISAGREE	NEITHER AGREE NOR DISAGREE	AGREE	STRONGLY AGREE
7. **I fully understand my role and duties for the G4G program.**	1	2	3	4	5
8. **I understand that labeling a food item correctly** ***(e.g., Eggs are not labeled as pancakes)*** **is important to maintaining diner trust in the program.**	1	2	3	4	5

9. **When a food item is given the** ***wrong Food Card*** ***(e.g., Baked Chicken Food Card placed on Corn)*****, the** ***best*** **way to address it is to:**
   1. Replace the card myself
   2. Notify another staff member to replace the card
   3. Notify the NCOIC or DFAC manager
   4. No need to do anything; it's an equivalent product.
   5. If you can't find the correct card, address at the next meal

10. **When a food item is labeled with the** ***wrong color code*** ***(e.g., French fries are coded Green)*****, the** ***best*** **way to address is to:**
    1. Replace the card myself
    2. Notify another staff member to replace the card
    3. Notify the NCOIC or DFAC manager
    4. No need to do anything; it's an equivalent product.
    5. If you can't find the correct card, address at the next meal

11. **You notice there is a new recipe** ***(or an existing recipe has an ingredient change)*****, how can you** ***best*** **get the recipe re-evaluated for a possible new food card code?** *(Pick only one answer)*
    1. I can choose the codes myself
    2. Notify the admin team who can assign the codes
    3. Notify the NCOIC or DFAC manager who can assign the codes
    4. Notify the NCOIC or DFAC manager who can obtain the codes from the Dietitian
    5. No need to do anything; it's an equivalent product

12. **Which option is incorrect?**
   1. Green = High Performance Food
   2. Red = Low Performance Food
   3. Yellow = Low Performance Food
   4. All of the above

13. **Which of the following is a key part of the revised G4G program?** *(Pick only one answer)*
   1. Food placement with easy access to Red-coded foods and beverages
   2. Food labeling with a revised two-part coding: Green, Yellow, or Red for nutritional quality and Low, Moderate, or High for sodium content
   3. Coding that highlights only low-calorie options
   4. Any staff member can determine the coding for Green, Yellow, or Red food items if he/she thinks the color code is wrong
   5. Food and beverages with a Red color code means it is a high-performance fuel

14. **A food item's color code is Green. Which of these actions could result in a change of the item's actual color code to Yellow or Red?**
   1. Changing the cooking technique or preparation method for a food item *(e.g., fry vs. bake)*
   2. Adding or replacing an ingredient that is not in the recipe *(e.g., butter instead of oil)*
   3. Using a different type or cut of meat than the recipe states
   4. Adding more low-fat cheese or sour cream than is in the recipe
   5. All of the above can change the color code of a food item

15. **Which of the following can be found on G4G food and beverage cards?** *(Select all that apply)*
   - A. Sodium code *(Low, Moderate, or High)*
   - B. Calorie count
   - C. Color code *(Green, Yellow, or Red)*
   - D. Food or beverage name
   - E. Grams of sugar

16. **In the spaces provided, match the form of a cooked white potato with its correct color code.**

	GREEN	YELLOW	RED
Deep-fried French Fries	G	Y	R
Baked with skin	G	Y	R
Baked French Fries	G	Y	R

17. **Can Green-coded foods be high in sodium?**
   - Y. Yes
   - N. No
   - U. Unsure

Awareness of G4G implementation at dining facility

Food placement describes the different ways that food choices could be presented to encourage selection of specific menu offerings and promote healthy eating (e.g., placing Green-coded items first on the hot line, putting fruit in highly visible locations, etc.)

18. Does your dining facility use *food placement* to encourage healthy choices?

- Yes *
- No
- Unsure

*If *Yes*, please describe some of the food placement efforts at your dining facility. Please list the change and the serving station name. Example: "Fruit was placed next to dessert options."

_____

_____

_____

_____

19. Match the color code to the order each item should appear on the hotline:

	GREEN	YELLOW	RED
1st on Serving Line			
2nd on Serving Line			
Last on Serving Line			

20. Are original G4G promotional materials currently on display within your dining facility?

- Yes
- No
- Unsure

21. Which of the revised G4G promotional materials are found within your dining facility?
(Choose all that apply)

- Posters
- Table tents or napkin dispensers
- Brochures
- Other (please specify):_____
- Revised G4G promotional sources are not displayed

22. What are the biggest changes your dining facility has made to promote Green-coded foods? Please describe:

_____

_____

_____

Attitudes/Beliefs about the revised G4G's implementation

Answer the following questions on your thoughts and feelings of Go for Green® program and your dining facility environment

	NEVER	RARELY (~20% OF TIME)	SOMETIMES (~50% OF TIME)	OFTEN (~80% OF TIME)	ALWAYS	N/A - NOT INVOLVED WITH FOOD PREP
23. **How often does the Food Card NOT match the food item *(e.g., pancake label for bacon)*?**	0	1	2	3	4	
24. **How often do you see the kitchen staff make changes to recipes *(e.g., add butter or oil)* during food preparation?**	0	1	2	3	4	
25. **How often does the color code seem wrong for the food item *(e.g., steamed vegetables coded red)*?**	0	1	2	3	4	
26. **How often do you make changes to recipes *(e.g., add butter or oil)* during food preparation without relabeling?**	0	1	2	3	4	5

27. **To what extent do you agree or disagree with the following statements:**	STRONGLY DISAGREE	DISAGREE	NEITHER AGREE NOR DISAGREE	AGREE	STRONGLY AGREE
a. The G4G program encouraged our dining facility to add more healthy food options into our menu.	1	2	3	4	5
b. The G4G program makes it easier to find the performance nutrition/healthy options in our facility.	1	2	3	4	5
c. The G4G program is a valued program in our dining facility.	1	2	3	4	5
d. The G4G program is easy to apply at our dining facility/galley.	1	2	3	4	5
e. The G4G program's healthy items are popular with our diners.	1	2	3	4	5
f. The G4G program's implementation is time consuming to dining facility staff.	1	2	3	4	5
g. It is a hassle to find or display G4G Food Cards.	1	2	3	4	5
h. Adding more healthy items on the menu is a priority at our dining facility/galley.	1	2	3	4	5

28. **Please choose any of the following challenges you experienced while implementing the G4G program.** *(Choose all that apply)*

- (A) It was difficult to follow the recipes exactly as printed on the recipe cards.
- (B) It was difficult to place the correct G4G food card when food items change.
- (C) It was difficult to maintain G4G Food Cards *(e.g., clean and orderly)*.
- (D) Diners were confused by G4G Food Cards.
- (E) Food service staff could not answer diner's questions about the G4G program.
- (F) Implementing the G4G program was time consuming.
- (G) Sometimes we did not have the right ingredients to implement the new menus.
- (H) Other, please list _____
- (I) None, there were no challenges with implementation.

29. **Please explain in more detail some of the biggest challenges you had when implementing G4G program.**

30. **What recommendation(s) would you make to improve the G4G program within this dining facility/galley?**

31. **What resources would help the staff at this dining facility/galley to improve G4G implementation?**

32. **How can the program become more useful for diners?**

Appendix G: Demographic & Lifestyle for Staff

Demographics & Lifestyle Information

Thank you for participating in this study. Please answer the following questions by filling in the circles that corresponds with your answer. All of the information you provide be kept confidential. Thank you.

MARKING INSTRUCTIONS	VOLUNTEER NUMBER	FILL IN TODAY'S DATE
• Use a No. 2 pencil only. • Do not use ink, ballpoint, or felt tip pens. • Make solid marks / fill the response completely • Erase cleanly any marks you wish to change. • Make no stray marks on this form. CORRECT: ● INCORRECT: ⊘ ⊠ ◒ ◔		MONTH, DAY, YEAR 20__

1. Gender:
   - ○ Male
   - ○ Female

2. What is your age today?

AGE years

3. Your height in inches? (without shoes/boots)

HEIGHT inches

for reference:
5 feet = 60 inches
6 feet = 72 inches

4. Your weight in pounds? (without clothing)

WEIGHT pounds

5. What is your ethnic background?
   - ○ 1 Hispanic or Latino
   - ○ 2 Not Hispanic or Latino

RACE_OTHER

6. What is your racial background? (select all that apply)
   - ○ 1 White or Caucasian
   - ○ 2 Black or African American
   - ○ 3 Native American/Alaskan Native
   - ○ 4 Asian
   - ○ 5 Native Hawaiian/Pacific Islander
   - ○ 6 Other:_____

7. Please indicate the HIGHEST level of education you have completed (pick only one)
   - ○ 1 Some high school (no GED or diploma)
   - ○ 2 High school graduate (GED or diploma)
   - ○ 3 Some college courses
   - ○ 4 Associate degree (two-year college)
   - ○ 5 Bachelors degree (four-year college)
   - ○ 6 Graduate degree

8. What is your rank?

Enlisted	
Officer	
WO	

9. What is your primary MOS? Description: _____

10. How long have you been in the Armed Services?

Active Duty

1 Less than one year **OR** If a year or more, please fill in the number of years (start with leading zero's when needed).

Appendix H: Satiety Labeled Intensity Magnitude (SLIM) Scale
Appendix H1: Pre-SLIM

Go for Green® Effectiveness for Changing Dietary Intake and Attitudes toward Nutrition for Performance Among Service Members (17-09-HC)

Pre-SLIM scale

MARKING INSTRUCTIONS	VOLUNTEER NUMBER	FILL IN TODAY'S DATE
• Use a No. 2 pencil only. • Do not use ink, ballpoint, or felt tip pens. • Make solid marks / fill the response completely • Erase cleanly any marks you wish to change. • Make no stray marks on this form. CORRECT: ● INCORRECT: ⊘ ⊠ ◒ ◔		MONTH DAY YEAR 20__

TIME (24 HR FORMAT)	PRE-MEAL ONLY: WHEN DID YOU LAST EAT SOMETHING	PRE-MEAL ONLY: WHAT WAS YOUR LAST MEAL	IF A SNACK, WHAT DID YOU EAT?
Station (A B C D)	1 Early morning snack* 2 Breakfast 3 Morning snack* 4 Lunch 5 Afternoon snack* 6 Dinner 7 Evening snack*	A B C	

Please indicate your level of hunger or fullness right now by placing a hash mark (/) on the scale below.

GREATEST IMAGINABLE FULLNESS
EXTREMELY FULL
VERY FULL
MODERATELY FULL
SLIGHTLY FULL
NEITHER HUNGRY NOR FULL
SLIGHTLY HUNGRY
MODERATELY HUNGRY
VERY HUNGRY
EXTREMELY HUNGRY
GREATEST IMAGINABLE HUNGER

DO NOT WRITE IN THIS BOX

slim code	snack code
	snack-1 snack-3 snack-5 snack-7

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Appendix H: Satiety Labeled Intensity Magnitude (SLIM) Scale
Appendix H2: Post-SLIM

Go for Green® Effectiveness for Changing Dietary Intake and Attitudes toward Nutrition for Performance Among Service Members (17-09HC)

Post-SLIM scale

MARKING INSTRUCTIONS	VOLUNTEER NUMBER	FILL IN TODAY'S DATE
• Use a No. 2 pencil only. • Do not use ink, ballpoint, or felt tip pens. • Make solid marks / fill the response completely • Erase cleanly any marks you wish to change. • Make no stray marks on this form. CORRECT: ● INCORRECT: ⊘ ⊠ ◒ ◔		MONTH DAY YEAR 20__

TIME (24 HR FORMAT)	POST-MEAL ONLY
Station (A) (B) (C) (D)	1. Was today's meal: (1) Shorter than usual (2) Typical (3) Longer than usual 2. Did you have enough time to eat what you want? (Y) Yes (N) No

Please indicate your response for the next questions by placing a hash mark (/) on the scale below.

3. How would you describe the speed you ate?

AS FAST AS POSSIBLE

DO NOT WRITE IN THIS BOX

AS SLOW AS POSSIBLE

4. Please indicate your level of hunger or fullness right now.

GREATEST IMAGINABLE FULLNESS
EXTREMELY FULL
VERY FULL
MODERATELY FULL
SLIGHTLY FULL
NEITHER HUNGRY NOR FULL
SLIGHTLY HUNGRY
MODERATELY HUNGRY
VERY HUNGRY
EXTREMELY HUNGRY
GREATEST IMAGINABLE HUNGER

DO NOT WRITE IN THIS BOX

Natick Form 5655 (One-Time) 18 Apr 2017

Appendix I: G4G Program Fidelity Checklist

Note: Reference with permission from G4G consultants.

G4G Management Checklist – Daily

Print for use during your daily maintenance walk-throughs.

Date: _____

Meal period (choose one): _____

Completed by: _____

Prepare menu items from approved recipes, and label them with the correct color and sodium codes.

Yes	No	Ensure Menu Coding Goals are met
		Is at least one Green-coded menu item offered on each line (Hotline, Deli Bar, Salad Bar, etc.) in each category as stated in the Menu Coding Goals?

Place Food Cards in the appropriate locations, and ensure they're clean and serviceable.

Yes	No	Check appearance of Food Cards or G4G Coding Signs
		Does the name on the Food Card match the food item prepared and served to diners?
		Does the color code make sense for the identified food?
		Does each menu item have an individual Food Card near or in front of it with color and (except beverages and fruit) sodium codes? Or is the G4G 8.5" × 11" Coding Sign displayed near the appropriate bar/serving station?
		Are Food Cards arranged in a way that is uncluttered and easy to read? Or is the G4G 8.5" × 11" Coding Sign clearly displayed and easy to read?
		Are Food Cards and holders clean and neat?
		If a menu item is switched out during service (for example, if one item ran out and was replaced with a different item), was the Food Card for the original item removed and replaced with a card that matched the new item?

Each serving area (Hotline, Deli Bar, Salad Bar, etc.) must have at least 3 food-placement strategies in place to market high-performance foods and beverages. See list in Appendix H: G4G Food-placement Goals.

Yes	No	Ensure placement of healthy food items
		For each serving line (Hotline, Deli Bar, Salad Bar, etc.), are Green-coded items displayed first on the line, followed by Yellow-coded ones, and then Red-coded items?
		Is water placed prominently at the Beverage Bar? For example, is there a tab on the soda fountain for water, or is infused water offered?
Serving Area:		Evaluate one serving area in detail for food-placement goals.
Goal 1:		
Goal 2:		
Goal 3:		

Food Promotion

Yes	No	Ensure promotion of healthy food choices
		Phases 1 and 2: Is there at least one Green-coded "Featured Meal" offered and displayed with a sample plate, photograph, or sign? **Phase 3 and Maintenance:** Is there at least one Green-coded "Featured Meal" offered and displayed with a sample plate, photograph, or sign at 3 stations?
Names of stations:		Which station(s) offered "Featured Meals" today?

G4G Management Checklist – Monthly

Print and complete monthly.

Take corrective action for any item that is not in compliance with your checklist. Identify any item(s) assessed as "not meeting" standards. These should include a record (including supervisor's name) of the reported issue(s), temporary solutions taken to address the matter(s), and recommendations for long-term solutions that will help prevent future recurrences.

Date: _____

Completed by: _____

Menu Items: Breakfast

Yes	No	Menu-item changes
		Have any new menu items been added?
		Have any recipe ingredients changed?
		If "yes," has this menu item been sent to the Certified G4G Coder for coding?
		If "yes," is a temporary white Food Card being used until coding is completed?
		Is coding completed and a new Green, Yellow, or Red Food Card being used?
		Are the Food Cards and white sticky labels or G4G Coding Signs in good condition (that is, no tears, holes, stains, etc.)?

Menu Items: Lunch

Yes	No	Menu-item changes
		Have any new menu items been added?
		Have any recipe ingredients changed?
		If "yes," has this menu item been sent to the Certified G4G Coder for coding?
		If "yes," is a temporary white Food Card being used until coding is completed?
		Is coding completed and a new Green, Yellow, or Red Food Card being used?
		Are the Food Cards and white sticky labels or G4G Coding Signs in good condition (that is, no tears, holes, stains, etc.)?

Menu Items: Dinner

Yes	No	Menu-item changes
		Have any new menu items been added?
		Have any recipe ingredients changed?
		If "yes," has this menu item been sent to the Certified G4G Coder for coding?
		If "yes," is a temporary white Food Card being used until coding is completed?
		Is coding completed and a new Green, Yellow, or Red Food Card being used?
		Are the Food Cards and white sticky labels or G4G Coding signs in good condition (that is, no tears, holes, stains, etc.)?

Marketing and Education

Yes	No	Marketing and educational materials
		Are posters displayed at eye level?
		Are permanent posters (Traffic Light, Food Cards, and Sodium) displayed at entrances and serving areas?
Date		Key-message posters should be rotated every 4 months. When were these last changed?
		Are G4G brochures neatly displayed in a highly visible location?
		Are table tents and table signs displayed on each table in the dining room?
		Are all marketing and educational materials in good condition (that is, no tears, holes, fading, stains, etc.)?
Yes	**No**	**Marketing and educational strategies**
		Has G4G been marketed outside your dining facility? Examples include articles in the installation newspaper or website, features in the health promotion or wellness department newsletter, and email announcements.
		Has G4G been marketed on social media? For example, have any G4G messages or graphics been posted on dining facility-level and command-level Facebook or Twitter accounts?
		Were any performance nutrition and/or G4G education talks offered to Service Members outside the dining facility this month? Refer to the nutrition asset on the local G4G Planning Team for verification.

Staff Training

Yes	No	Staff training should be up-to-date and verified
		Is 80% of current staff trained on G4G? Review staff training records.
		Have any new staff members arrived in the past month?
		If "yes," have they been oriented to G4G (target: within one month)?
		Was a G4G in-service, refresher training, or program update session provided to staff this month?
Module/Topic		**If "yes," which module or training topic?**
		Have staff members been trained on how to prepare and display any new menu items or ingredients?
Menu items		**If "yes," which items?**