

USARIEM TECHNICAL REPORT T12-02

**COMMERCIAL CAFFEINATED PRODUCTS FOR MILITARY USE: CUSTOMER
ACCEPTABILITY**

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14. ABSTRACT Warfighter cognitive performance degrades during sustained operations in part due to difficulty consuming adequate calories and limited access to stimulants such as caffeine. This investigation tested the effectiveness of a snack-based ration, containing caffeinated components, to increase energy and preserve cognitive performance during sustained operations. Eighty-nine Marines consumed either an entree-based (MRE) or a snack-based (FSR) ration during a four-day field exercise with limited sleep. Outcome measures included visual reaction time, logical reasoning, mood state (POMS), and energy intake. Total calories, CHO and caffeine intake was greater (P<0.05) for FSR compared to MRE in part due to a significant increase in the number of daily eating episodes in those consuming the FSR (P<0.05). Reaction time was faster and fewer lapses in attention occurred in Marines consuming the FSR compared to MRE (P<0.05). There was no difference in logical reasoning between groups. Overall mood deteriorated over the course of the exercise with no difference between ration groups.					
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BACKGROUND

Caffeine is an effective supplement for sustaining physical and cognitive performance, particularly when sustained vigilance is necessary and sleep deprivation is present. A gum product containing caffeine is provided in the individual field ration, the First Strike Ration. While this product is acceptable, there may be other modes of delivery that are equally effective as a vehicle for caffeine delivery and that could be used to increase variety for consumers. The commercial market has introduced a number of different delivery vehicles for caffeine, including sweet-tasting beverage powders, mints/candies, and various food products. This investigation aimed to identify the Warfighter's preferred vehicles for caffeine delivery, and solicit Warfighter opinions regarding the optimal quantity and variety of caffeinated products for individual field rations.

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EXECUTIVE SUMMARY

Caffeine is effective for sustaining physical and cognitive performance, particularly under conditions when sustained vigilance is necessary and sleep deprivation is present. The purpose of this project was to determine Warfighter preferences for caffeine-containing food products, particularly in regards to their acceptability and utility in individual ration packs. An initial survey of Warfighters (n=1265), at 4 separate stations and geographic locations in the continental United States, was performed to identify typical Warfighter caffeine use and commonly consumed caffeine products. Survey results narrowed down the field to the top 10 most wanted caffeine products for follow-on investigations in a garrison setting (n=102). Ensuing field tests allowed Warfighters (n=62) to sample the products during field training and then self-select 3 caffeine products per day over a 2 day field training exercise to obtain product preference. Energy shots were the most preferred caffeinated product, as 90% of Warfighters picked up at least one of this product-type each of the two self-select days, and 72% of those individuals picked two or more energy shots each day. Caffeinated gum was the next most popular product selected by 36% of Warfighters and 14% of products picked, followed by a caffeinated beef jerky (23% and 9%), fruit chews (18% and 7%), chocolate chews (6% and 3%) and energy bar (10% and 3%). The Warfighters preferred the energy shot and gum for their convenience, effectiveness, size/weight, and durability.

INTRODUCTION

The commercial availability of caffeinated products has been growing rapidly. This expansion of the commercial market reflects civilian customer demand, which varies across demographic factors. Caffeine consumption and caffeine preference varies according to the individual's age; with younger Warfighters preferring energy drinks and older Warfighters preferring coffee and tea products (Lieberman 2011). However, whether Warfighter preferences mirror civilian preference for caffeine products is not known, nor is it known whether these commercial caffeinated products are acceptable for incorporation into individual ration packs. A search of the Defense Technical Information Center (DTIC) literature using the key words "caffeine survey," found 429 matches of which none involved caffeine preference. As secondary DTIC search for key words "caffeine gum" yielded two reports that involved the efficacy of gum in field in regards to performance, but no information regarding preferred caffeinated food products for Warfighters.

Caffeine consumption can improve physical performance, and reduce sensation of discomfort during vigorous exercise (Cole 1996, Graham 2001, Motl 2003, McLellan 2004). Caffeine ingestion can also enhance cognitive performance, particularly when sleep is restricted (Amendola 1998, Lieberman 2002, McLellan 2005a, 2005b, 2007). Based on these findings, the Food and Nutrition Board of the Institute of Medicine (IOM 2001) recommended that 100-600 mg of caffeine be provided in operational rations for cognitive and psychomotor performance sustainment during periods of sleep deprivation.

A gum product containing caffeine is provided in the individual field ration, the First Strike Ration (FSR). However, in a recent (FSR) field test with ration-experienced Warfighters (McClung 2011) the caffeinated gum received mixed product acceptability ratings. Although previous research suggests caffeinated gum is a fast and efficacious manner to deliver caffeine (Kamimori 2002), other forms of delivery may be preferred by the Warfighter. For example, the popularity of energy drink consumption was demonstrated in a recent survey by the Air Force, with 61% of Airmen surveyed reporting that they consume caffeinated energy drinks, and 30% of respondents consume this product type least once a week (Schmidt 2008). Energy “shots” (2-4 fluid ounce beverage containing approximately 100 mg of caffeine) are another new popular caffeinated product grossing over \$800 million dollars in sales in 2011 (Sports Drinks 2011). To assist with the Combat Feeding Directorate (CFD) effort to improve the efficacy of operational rations, The Military Nutrition Division of the United States Army Research Institute of Environmental Medicine (USARIEM) performed a set of experiments to establish Warfighter intake and preferences for caffeine delivery.

METHODS

To define the preferred vehicles for caffeine delivery as well as the quantity and variety of caffeine items in individual field rations, customer preferences and the acceptability of select commercial caffeinated products for military use were captured using a three-part data-collection strategy. In Phase 1, Warfighters were surveyed using a questionnaire to identify current caffeine intake (average: mg/day), caffeine-containing products most widely used by military personnel, and what products they felt

deserved consideration for field use. From the Phase I questionnaire a top ten list of caffeine items was generated for further taste and acceptability testing. In Phase II, Warfighters were provided ten caffeine-containing product types to sample in garrison. Their feedback was then used to down select the six most preferred products for use in the Phase III field evaluation. In Phase III, the objectives were to determine the acceptability of the caffeine products in an operationally relevant environment and to objectively study Warfighter product preferences. To determine product acceptability, the participants initially sampled the caffeine products while training in a field setting and provided feedback regarding product performance. To study product preferences, the participants were provided the opportunity to pick three caffeinated items from the caffeine product inventory on two consecutive days, and the products selected and their fate (consumed or discarded) were recorded. A questionnaire was provided after the Phase III field tests, to capture why the participants chose the items they selected and to collect their preferences for delivering caffeine in an individual field ration.

Phase I

A questionnaire (Appendix A) was administered to 1,265 Warfighters from the Marine Corps Mountain Warfare Training Center (MCMWTC; Bridgeport, CA), Twenty-Nine Palms (San Bernardino, CA), Naval Air Station Jacksonville (Jacksonville, FL), Camp Atterbury (Columbus, IN), and Fort Polk (Fort Polk, LA). Only Warfighters who had a history of consuming individual rations during field operations were included in the evaluation. The survey is provided in Appendix A, and asked for demographic information, the types and amounts of caffeine containing products they typically consume, caffeine product types they have tried in the field and/or would be worth

further consideration, and their recommendations for caffeine in combat rations. The top ten caffeine products identified were matched with commercially available products for product acceptability and utilization studies in Phases II and III.

Phase II

A total of 102 Warfighters participated in Phase II data collection. They were Warfighters from the MCMWTC (n= 80) - primarily engaged in indoor and outdoor classroom instruction, and the Special Tactics and Training Squadron (STTS), Hurlburt Field, FL (n=22) involved in a field training exercise. They were male and ranged in age from 20 to 42 years old (28[5] yr). Eighty percent of the participants were enlisted with a rank of E-3 to E-8. Nineteen percent were Officers, with 74% being O-1 or O-2. The participants were drawn from a mix of MOS, with infantry (n=64) having the greatest representation. During this 4 day product sampling phase, ten commercially available caffeine products (cited products from the Phase I Warfighter evaluation) were provided in their original packaging to Warfighters following a brief investigator description of products and intended use. Warfighter ratings of taste (7-pt Likert Scale: 1=dislike extremely to 7=like extremely), serving size, ease of consumption and overall acceptability, and side effects were obtained by questionnaire (Appendix B). Ratings of product value and desirability were obtained via post-sampling questionnaire (Appendix B) that included identifying and ranking the top 5 products in order of preference. A weighted score was calculated and the top six caffeine-containing products were identified and bundled for Phase III (field environment) evaluation.

Phase III

A subset of the Phase II Warfighters participated in Phase III (n=62), including 42 individuals from MCMWTC (May and June 2010) and 20 from STTS (November 2010). The MCMWTC participants primarily performed day and night rock climbing tasks, while those in STTS were performing dismounted movements and established and operated forward communication assets for ground to air coordination during simulated air strike missions.

Phase III participants received a total of seven products, the top six caffeine-containing products from Phase II plus caffeinated gum (an existing ration component). At MCMWTC, the participants were provided bundles containing 3 caffeine items over the first two days. Day 1 caffeine products were: chocolate chews, chocolate candy, beef jerky; Day 2 products were: energy shot, energy bar, fruit chews. Each bundle provided approximately 300 mg caffeine. They were instructed to sample the items and score each product for acceptability. On each of the next two days, the participants were instructed to self-select three items from an inventory of the seven caffeinated products. They could select multiples of the same item or up to three different item types. The investigators recorded the products that were chosen and if they were consumed during the field training. Product feedback, user preference and their opinions on how to bundle caffeine in a ration platform such as the FSR were collected through daily intake assessment logs (and collection of eaten and uneaten product wrappers) and post-Phase III questionnaire (Appendix C). The Phase III experimental design was modified somewhat for the STTS Warfighters, their schedule did not accommodate both the field sampling and self-selection components of the intended Phase III design. Instead, they performed only the self-selection portion of Phase III

design, selecting three caffeine products prior to an initial 1 day field training mission and 6 products prior to a 2-day field training mission. For the latter, data analysis only considered caffeine usage over the first 24 h of the mission.

Data analysis

Descriptive statistics were generated from all questionnaires (Appendix A-C). Comparisons between products were made using chi square and inferential confidence intervals. To determine the most popular products from Phase II, a weighted composite score for each product was generated, where: score = (# of times ranked 1st x 5) + (# of times ranked 2nd x 4) + (# of times ranked 3 x 3) + (# of times ranked 4th x 2) + (# of times ranked 5th x 1). A one-way ANOVA was used to determine the total amount of caffeine intake and product categories as a function of age. Chi-square was used to examine if primary caffeine sources and product preferences for field use differed as a function of age. Data were analyzed using SPSS (version 18) statistical software. Data are presented as mean [sd]. A *P* value ≤ 0.05 was considered significant.

RESULTS

Phase I

A total of 938 acceptable surveys, of a possible 1265, were obtained from Warfighters at MCMWTC (n=29), Twenty-Nine Palms (n=239), Naval Air Station Jacksonville (n=67), Camp Atterbury (n=305), and Fort Polk (n=298). Eighty-seven percent were male. Ninety-two percent were enlisted, with 53% of rank E-3 or E-4. Six percent were Officers, with 46% being O-1 or O-2. The participants were drawn from a

mix of military occupational specialties (MOS) (> 11 MOS), with engineers (n=176), transportation (n=141) and infantry (n=137) having the greatest representation. The participants were experienced users of individual ration packs, with 69% reporting consuming them “many times” and additional 27% having consumed them “several times”. The majority also consumed caffeine products when in the field, with 43% self-reporting consumption of 100-300 mg/day and an additional 35% self-reporting >301 mg/day; only 23% reported no consumption when in the field. Typical daily caffeine intake averaged 451[513] mg/day (Table 1).

The Phase I respondents consumed multiple forms of commercially-available caffeine products; liquid forms (49%), energy bars (45%), energy shots (40%), candy bars (31%), and gum (24%) were the five caffeinated-product types most frequently reported. Seventy-nine percent of the respondents reported use of caffeinated products during field training and/or missions, with liquid forms (38%), energy bars (37%), energy shots (26%), beverage powders (20%), candy bars (20%) and gum (17%) cited with greatest frequencies. Age influenced the typical sources of caffeine. As illustrated in Figure 1, younger Warfighters (< 35 yrs) obtained their caffeine primarily from soda and energy drinks whereas the older respondents (\geq 35 yrs) obtained their caffeine primarily from coffee ($\chi^2=125.7$; $p < 0.01$). The same pattern of product choice persists when the self-reported consumption behavior is stratified by age (Table 1).

In response to the question, “*Which caffeinated products would you prefer in the field? (pick 3 products)*”, the most frequently chosen caffeinated product-types were: liquid beverages (42%), energy shots (40%), energy bars (36%), beef jerky (27%) and candy bars (25%); the remaining top ten included gum; beverage, powdered; sunflower

seeds; chocolate covered espresso beans; and chewy candies (Figure 2). Product preferences were somewhat dependent on age; while liquid beverage was cited more or less at same frequency independent of age ($\chi^2=7.2$; $p >0.05$), energy bar and energy shots were recommended more often by participants < 35 years old ($\chi^2=9.7-10.4$; $p <0.02$) whereas those older than 35 more frequently recommended candy bars ($\chi^2=14.1$; $p <0.01$) (Figure 2).

The Warfighters had varied opinions regarding how much caffeine a ration pack/system should provide daily. Warfighter responses ranged from 100 to 1,000 mg per day. The mean response was 442[268] and median was 400 mg caffeine per day. They also had varied opinions regarding the number of caffeinated items to achieve the daily caffeine dose, with responses ranging from 1 to 12 items per 24 hour ration pack/system; the median response was 4 items. The preferred number of items per day was dependent on the amount of caffeine the respondents desired in the ration (Table 2). Food items appeared to be an acceptable vehicle for caffeine delivery as 3 of their top 5 most recommended items were food products. Moreover, 50% of non-caffeine users picked food components for caffeine delivery. When asked to construct a ration with caffeinated products from food, beverage, candy and accessory categories, 79% of respondents preferred caffeine come from more than one single product category (e.g. not just from food, beverage, candy, or accessory). The beverage category was selected by 80% of respondents. Next most popular was food (63%), followed by accessory (48%) and candy (45%). Sixty one percent of respondents constructed their ration with greater than one caffeinated beverage per day. Whereas, the most frequent response was 1 item/day from the other categories.

Phase II

Ninety-six percent of the participants consumed caffeine on regular basis; 18% consuming 16-99 mg/day, 46% consuming 100-299 mg/day, and 32% consuming 300 mg or more per day. The average reported caffeine intake was 299[315] mg/day; with coffee and energy drinks being the primary sources. The products provided to the respondents were relatively novel to them, as only 5%, 10%, 13%, 4% and 12% reported that they had previously tried caffeinated forms of beef jerky, chewy candies, energy concentrates, sunflower seeds or candy bars, respectively. However, 59% and 48% of the respondents had a history of consuming energy shots and energy bars.

Table 3 presents the commercial products sampled in Phase II. The liquid beverage, despite being the most preferred in the Phase I evaluation (Figure 1), was not included in the Phase II evaluation after consultation with the ration developer (CFD) revealed that this product type is too big and heavy for ration pack inclusion. Similarly, they suggested elimination of the chocolate covered espresso beans and jelly beans as both products had recently failed shelf-stability tests. Likewise, caffeinated strips were disqualified as they aren't eligible for ration inclusion. Beverage tablets were considered too similar to beverage powder and also eliminated from further consideration. To generate 10 unique product types, chewy candies and an energy concentrate were selected.

Table 4 presents the acceptability scores for the 10 products. As a consequence of initial MCMWTC class providing poor verbal and written rating for taste of the arctic mint flavored caffeinated gum, spearmint flavored gum was substituted and used for all remaining Phase II and Phase III tests. It should be noted, that many of the participants

did not sample all 10 products. Reasons for not sampling a product were varied. The energy shot was rated highest overall and nearly 89% of those who responded reported that they would use energy shots if they were provided. The spearmint flavored gum received an overall rating that was similar to other products (except energy shots), but Warfighters rated the gum as more valuable and more likely to consume. Table 5 presents the participants preferred products for Phase III evaluation.

Phase III

The Warfighters in Phase III testing self-selected energy shots more frequently than any of the other caffeinated products (Figure 3). Energy shots were self-selected by 90% and 89% of participants on the first and second day of field training respectively. Importantly, 72% of those individuals picked 2 or more energy shots each day. Out of the possible 372 item-opportunities for the energy shot to be selected (62 vol x 2 days x 3 items/day), energy shots were selected 218 times (59%, Figure 4). The product was also consumed at a high rate, as 81% of the bottles taken to the field were consumed (Figure 5). Eighty seven and 93% of the Warfighters rated the energy shots favorably (≥ 5 on 7 point scale) on day 1 and day 2 of field training respectively, and 95% believe the energy shot would be a valuable addition to the ration.

Caffeinated gum was the second most frequently selected product (Figure 3 & 4) with 30 individuals selecting at least one pack of gum and 5 selecting two packs on a test day. Ninety-three percent consumed at least one piece of the gum on a test day. When the total number of pieces (5 pieces per package) is taken into account, the total amount of caffeine consumed, was second only to energy shots (Figure 5). Ninety-two and 88% of the Warfighters on day 1 and day 2, respectively, of field training rated the

gum favorably (≥ 5 on 7 point scale), and 86% indicated that caffeinated gum would be a valuable addition to the ration pack.

The third most selected product was the caffeinated beef jerky, representing 9% of the products chosen (Figure 3 & 4). The beef jerky was selected by 32 and 15% of the Warfighters on day 1 and day 2 respectively, and 97% of the beef jerky taken was consumed (Figures 5). Moreover, 70% of Warfighters indicated on their exit survey that the caffeinated beef jerky would be a valuable addition to the ration.

The remaining four caffeine products were picked by very few participants and usually only single quantities were taken. Combined together, they accounted for only 15% of the inventory removed by Phase III participants (Figure 4). Warm weather was a possible confounding factor to the poor performance of the two chocolate products (chocolate chew and chocolate candy), as both melted in warmer weather. The heat instability of the chocolate candy was so profound that the product was not offered to STTS participants (and not presented in the Phase III figures or tables).

Table 6 presents the acceptability ratings for the 6 products used in Phase III. Energy shot was rated as a valuable item by more Warfighters than the other products; with gum second. Eighty-two percent of the Warfighters reported that they would be “extremely likely” to consume energy shots if the product were made available to them when subsisting on individual rations. Eight out of 10 reported that they would consume the gum and beef jerky if they were made available. Figures 6 and 7 illustrate the product attributes that led to their selection during Phase III testing. For energy shots and gum, the most frequently cited attributes were convenience and effectiveness.

These attributes were cited less frequently for the other products and didn't stand out compared to other features such as ability to inhibit hunger and taste.

The Warfighters in Phase III testing most frequently recommended ~300 mg/d of caffeine, with the average requested being 500 mg/d (Table 7). The users felt that 4 caffeinated items would be sufficient, and preferred a variety of items over the same item. When asked to partition the items into accessory, food, beverage or candy type products, the averaged response was 2 accessory items, with balance from the other category types. Three flavors of any item was selected as satisfactory for sufficient taste variety for extended ration use (e.g., greater than 7 days).

DISCUSSION

This research effort determined the vehicles of caffeine delivery preferred by Warfighters for individual ration packs as well as their opinions regarding product variety and quantity. Survey instruments and consumer behavior assessments were used to formulate recommendations regarding product types to consider for ration pack inclusion. Naive or invalid consumer feedback was minimized by targeting experienced Warfighters who subsist on individual rations as part of their military duties and/or perform duties where caffeine might be beneficial for sustaining performance. Overall the participants reported levels of usual caffeine intake is in agreement with findings of other studies of military personnel (Lieberman 2011).

The primary finding is that energy shots were the preferred mode of caffeine delivery. Energy shots were a popular item throughout all three test phases (Figures 2-

5; Table 4 & 6), and this product type ranked among the top 3 cited products when stratified by age (Figure 1). The acceptability of energy shots for field use is evident from the finding that 9 out of 10 Warfighters participating in Phase III testing self-selected at least one energy shot for a source of caffeine, and >80% of the bottles taken were consumed.

Caffeinated gum produces pronounced increases in blood caffeine levels and is an effective vehicle for preserving Warfighter performance during periods of sleep deprivation (McClellan 2005a, 2005b, 2007; Lieberman 2002). In our study, the caffeinated gum was the second most frequently selected caffeine product during Phase III assessments (Figures 3 & 5). It also accounted for the second most doses of caffeine consumed (Figure 4). Eighty-six percent of participants in Phase III ranked the gum as a valuable product and 79% reported that they would consume caffeinated gum if provided. Acceptability, however, was dependent on taste acceptability and education, as product selection was initially low (iteration 1 = 7%); it increased markedly (iteration 2= 100%; iteration 3=70%) once the unpopular tasting arctic mint flavor was replaced and participants were specifically instructed that the gum should only be chewed for a few minutes and then discarded. Regardless, the current study demonstrates that caffeinated gum is a Warfighter-accepted vehicle for caffeine delivery.

The attributes that contributed to the popularity of energy shots and gum were their convenience, effectiveness, size/weight, and durability. The other products were selected for different attributes. For example, beef jerky was selected not only because

it was convenient, but also for its taste and ability to inhibit hunger. Likewise, the fruit chews were selected primarily for taste and sweetness characteristics.

In each phase of the experiment, food products were rated as an acceptable vehicle for caffeine delivery. In Phase I, beef jerky, energy bar, and sunflower seeds were among the top 10 most frequently cited caffeinated products for further consideration, and in Phase II beef jerky and energy bar were rated sufficiently high to be carried forward for Phase III. During Phase III, the third most frequently selected product overall was the caffeinated beef jerky. Thus Warfighters appear amenable to supplementing ration food components with caffeine.

The participants recommended that caffeine be included in field rations and be available in multiple items. Phase I respondents recommended that the caffeine be delivered in 3-6 items or doses per day. These Warfighters also preferred that the ration include a variety of delivery vehicles for caffeine rather than just a single product. As shown in Table 7, if supplied with four caffeinated items per 24 hour ration, Phase III participants would build the ration with two accessory type items (e.g., energy concentrate/shots, gum, mints, caffeinated breath spray, or strips) and two items from the food, beverage and/or candy categories. Three flavors of any item type is apparently adequate, as this was the most frequently cited number for energy shot, energy bar, fruit chew and gum products. In contrast, respondents thought one flavor of beef jerky or chocolate chew was sufficient.

The level of usual caffeine use in this study is in general agreement findings of other studies of military personnel. The reported typical intake of 300-500 mg/day is consistent with a separate multi-service survey of caffeine intake (Lieberman 2011).

Likewise, the finding that younger Warfighters typically receive their caffeine from soda and energy drinks, whereas the older Warfighters rely on coffee and teas for their caffeine sources (Figure 1) is consistent with behavior of other service members (Lieberman 2011).

There are some limitations in this study design that could have influenced the study outcomes. First, we relied on commercially available caffeine products to represent the modes of delivery that Phase I participants expressed interest for field use. While we attempted to gather products that had received positive customer acceptability scores or were known leaders in their market, they were not matched for taste acceptability. We also kept the products in their original packaging; there was no attempt to hide the commercial labels from the participants. Therefore, the results could be skewed if a participant had prior impressions of a specific product(s). Lastly, as the gum came packaged as 5 pieces inside a single overwrap, this item couldn't be delivered in single serving units. This could have influenced the number of packages that were self-selected, as each package would provide five doses of caffeine (500 mg total caffeine) rather than just a single (100 mg) dose. Regardless, each participant in Phase II and III sampling had opportunities to sample and form their own opinions about each product. Moreover, the data were examined not only by what was selected but what was consumed. As such, it is unlikely that the above limitations affect the general outcomes of this study.

CONCLUSIONS

Energy shots were the most preferred vehicle for caffeine delivery by the Warfighters we studied in field settings. Caffeinated gum was also an acceptable

product. These products were most frequently cited for their convenience, effectiveness, size/weight, and durability during field training. Food products were acceptable modes of caffeine delivery, and caffeinated beef jerky was the third most popular caffeinated item when the Warfighters were permitted to self-select their caffeine products. Warfighters recommended that 24 hour ration/system provide 300-500 mg of caffeine with the caffeine divided into three to six units.

RECOMMENDATIONS

These findings justify development of new ration components to increase the variety of caffeine products in ration packs. As energy shots are clearly a preferred delivery vehicle for caffeine, efforts should be made to include this mode of caffeine delivery in future ration menus. Additionally, efforts should be made to increase the variety of caffeinated products and/or number of flavors to avoid component item fatigue. Study recommendations are for the ration to include three or more caffeinated products with each unit of delivery providing 100-135 mg of caffeine, and packaged to provide 300-500 mg caffeine daily.

Table 1. Self-reported daily caffeine intake of Phase I participants sorted by age and caffeine product source.

	Mean, mg	Coffee, mg	Tea, mg	Soda, mg	Energy drink, mg	Gum, candy, medications, mg
18-20 yr (n=148)	338 [452] ^A	73 [208] ^A	43 [122]	102 [211]	101 [192] ^{AB}	19 [88]
21-24 yr (n=298)	404 [459] ^A	102 [197] ^A	57 [118]	81 [130]	141 [255] ^A	23 [96]
25-29 yr (n=168)	479 [528] ^{AB}	127 [213] ^A	65 [140]	104 [164]	156 [296] ^A	26 [117]
30-34 yr (n=113)	472 [503] ^{AB}	184 [315] ^A	91 [260]	82 [113]	103 [182] ^{AB}	12 [69]
35-39 yr (n=87)	627 [676] ^B	309 [457] ^B	105 [193]	101 [130]	100 [202] ^{AB}	12 [37]
40-44 yr (n=53)	517 [521] ^{AB}	306 [422] ^B	82 [144]	73 [115]	35 [92] ^B	22 [101]
> 45 yr (n=66)	489 [508] ^{AB}	297 [376] ^B	103 [185]	59 [110]	21 [58] ^B	9 [43]
Overall	451 [513]	157 [292]	70 [161]	89 [152]	114 [228]	20 [90]

Data are mean [sd] for n=938; different letters denote between group statistical differences, similar letters denote no statistical difference.

Table 2. Interaction between Phase I participants recommended quantity of caffeine in a daily ration and desired number of caffeinated items in the ration.

Qty of Caffeine in Ration	1-2 items/day	3-6 items/day	7+ items/day
Low (100-200 mg/d)	52%	42%	6%
Mod (300-400 mg/d)	17%	77%	7%
High (500+ mg/d)	6%	70%	24%

n=938

Table 3. Products that were sampled during Phase II.

Product	Commercial Name	Manufacturer	Caffeine Dose/serving	# servings/ pkg
Chocolate Chews	Buzz Bites Chocolate Chews	Vroom Foods, Inc.	100 mg/ pc; 6 pc/pkg	6
Chocolate Candy	Starbuzzer's Rocket Chocolate (English Toffee Latte)	Galaxy International	150 mg/ 11g bar	1
Energy Bar	First Strike Bar (Mocha)	Sterling Foods	110 mg/ 35 gm bar	1
Energy Concentrate	FIXX Extreme Ultra Shot (Cappuccino)	Fixxtreme, Inc.	400 mg/ 5 ml packet	1
Energy Drink Powder	ZipFizz Energy Drink Mix (Orange)	Zipfizz Corp.	100 mg/ tube	1
Energy Shot	5-h Energy Shot (Orange)	Living Essentials	138 mg/ 59 ml bottle	1
Fruit Chews	Atomic Energy Bites (Fruit Punch)	Atomic Energy Bites	33 mg/ pc; 3 pc/pkg	3
Gum	Stay Alert Chewing Gum*	Mastix Medica	100 mg/ pc; 5 pc/pkg	5
Beef Jerky	Lightning Rods Synergy Beef Stick	Power Hungry Foods LLC	75 mg/ stick	1
Sunflower Seeds	SumSeeds	Dakota Valley Products	140 mg/ 25 gm pkg	1

Abbreviations: pc- piece; pkg- package

Stay Alert Chewing Gum flavors included arctic mint and spearmint

Table 4. Acceptability scores for ten caffeinated products provided in Phase II sampling.

Product	Taste [†]	Serving Size [†]	Ease of Use [†]	Overall [†]	Value, %Yes	Eat if Provided, %Yes	Use during FTX, % Yes
Energy Shot	5.0 (0.4)	5.1 (0.5)	6.4 (0.2)	6.1 (0.3)	85	89	88
Beef Jerky	4.7 (0.4)	4.3 (0.4)	5.7 (0.4)	5.0 (0.4)	57	68	62
Fruit Chews	4.4 (0.4)	4.5 (0.5)	5.6 (0.3)	4.8 (0.4)	52	66	63
Chocolate Chews	4.6 (0.4)	4.8 (0.4)	5.2 (0.5)	4.9 (0.4)	53	66	51
Energy Concentrate	3.4 (0.8)	4.4 (0.6)	4.7 (0.7)	4.1 (0.6)	37	54	41
Energy Bar	4.7 (0.4)	4.6 (0.5)	5.2 (0.4)	4.9 (0.4)	55	63	58
Chocolate Candy	5.0 (0.4)	4.3 (0.5)	5.4 (0.5)	5.1 (0.4)	46	64	56
Gum *	3.5 (0.5)	5.1 (0.5)	5.8 (0.4)	4.7 (0.5)	76	76	71
Sunflower Seeds	5.4 (0.4)	4.8 (0.6)	4.6 (0.6)	4.9 (0.5)	52	67	55
Energy Drink Powder	5.3 (0.5)	5.1(0.6)	5.1 (0.6)	5.2 (0.5)	43	53	46

*Spearmint Flavor; [†]values based on number of participants who rated the product. n= 102; Data are mean (95% CI).

Table 5. The Phase II top six caffeinated products ranked in order of preference.

Item	Composite Weighted Score
Energy Shot	317
Beef Jerky	152
Chocolate Chews	132
Fruit Chews	123
Energy Bar	110
Gum*	109

n= 102; *both arctic mint and spearmint flavor data included.

Table 6. Acceptability of the caffeinated products provided to Phase III participants.

	Energy Shot	Gum	Beef Jerky	Energy Bar	Fruit Chew	Chocolate. Chew
Valuable?	95%	86%	72%	66%	62%	54%
Would you use?	98%	79%	82%	74%	70%	69%
Likely to use during field training?						
Yes	98%	76%	82%	78%	61%	60%
Extremely Likely	82%	48%	51%	32%	30%	29%

n=61

Table 7. Phase III participant preferences for delivering caffeine in daily field rations.

Question	Mean	Min	Max	Mode	Median
How much caffeine (mg)?	525	200	1000+	300	500
Distributed into how many items?	4	2	12	3	3
Variety in 24 h?	Variety				
# of items as accessory item?	2	0	5	2	2
# of items as food?	1	0	4	1	1
# of items as beverage?	1	0	6	0	1
# of items as candy?	1	0	6	1	1
How many flavors?	3				

n=61; serving = equivalent to 1 cup of coffee (100 mg); shading indicates statistics are not applicable for survey question; accessory= caffeinated breath spray, strips, energy concentrate/shots, gum, or mints; food= beef jerky, gels, energy bar, pudding, and sunflower seeds; candy= candy bar, chewy candy or chocolate, chocolate covered coffee beans, jelly beans, or lollipops.

Figure 1. The interaction of age on primary source of caffeine of Phase I respondents.

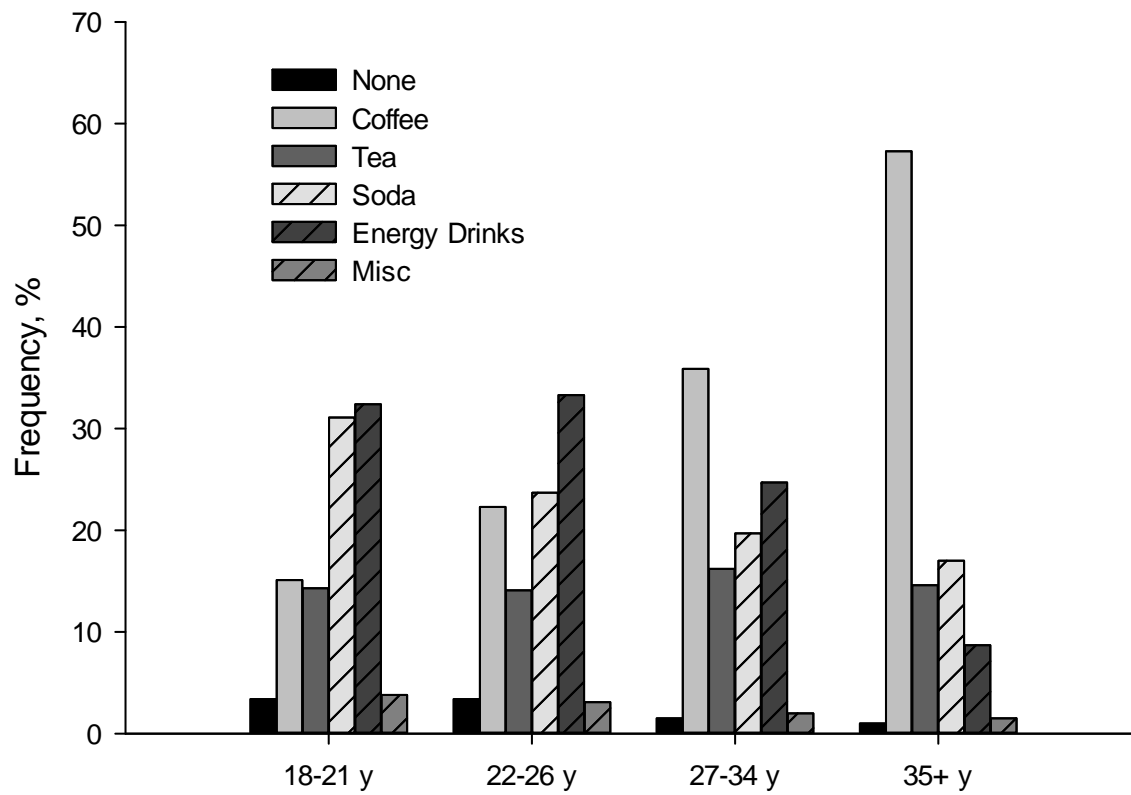


Figure 2. Caffeine product types recommended by Phase I respondents for field consideration sorted by frequency they were recommended.

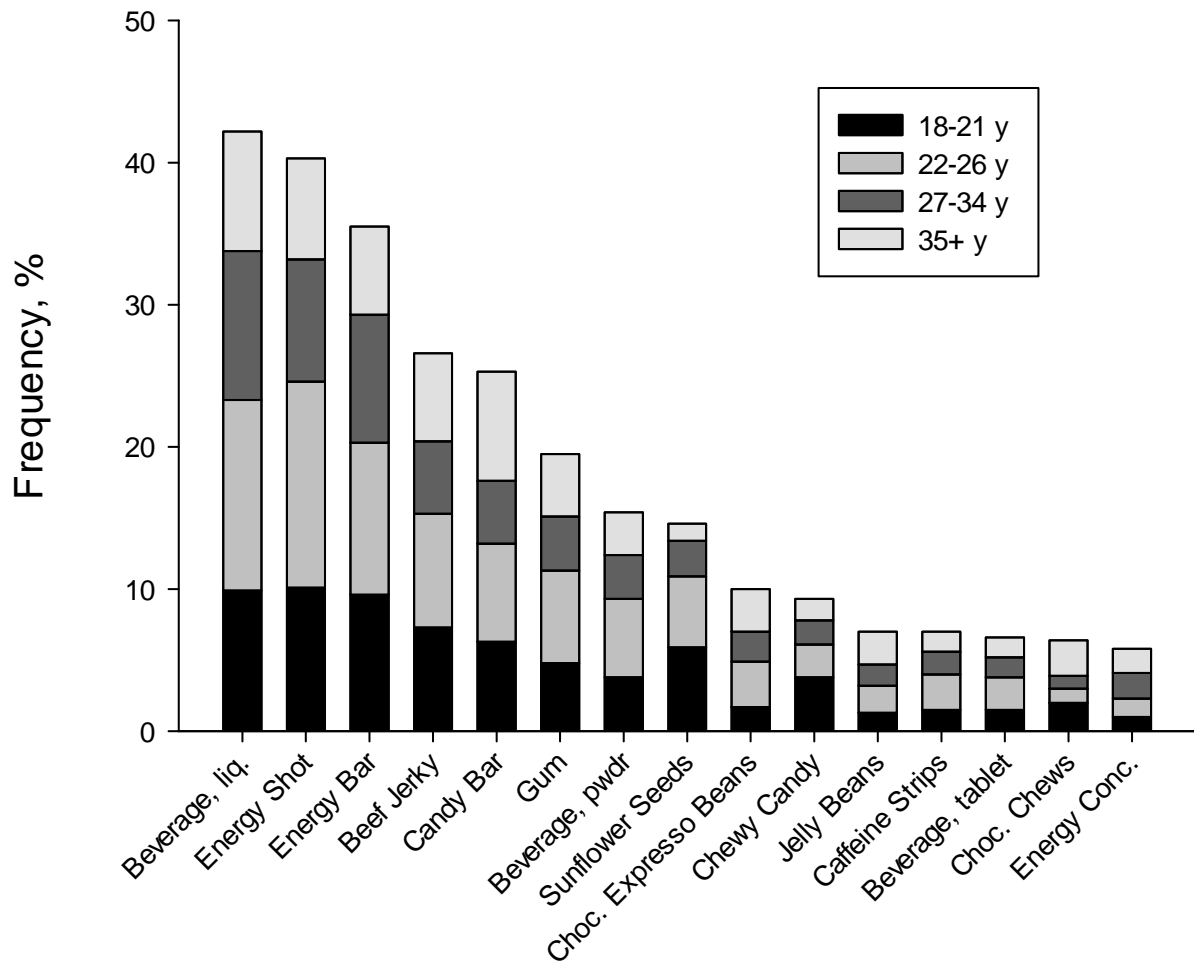


Figure 3. Percent of participants selecting the caffeinated products during Phase III self-select test (2-day average). N=62.

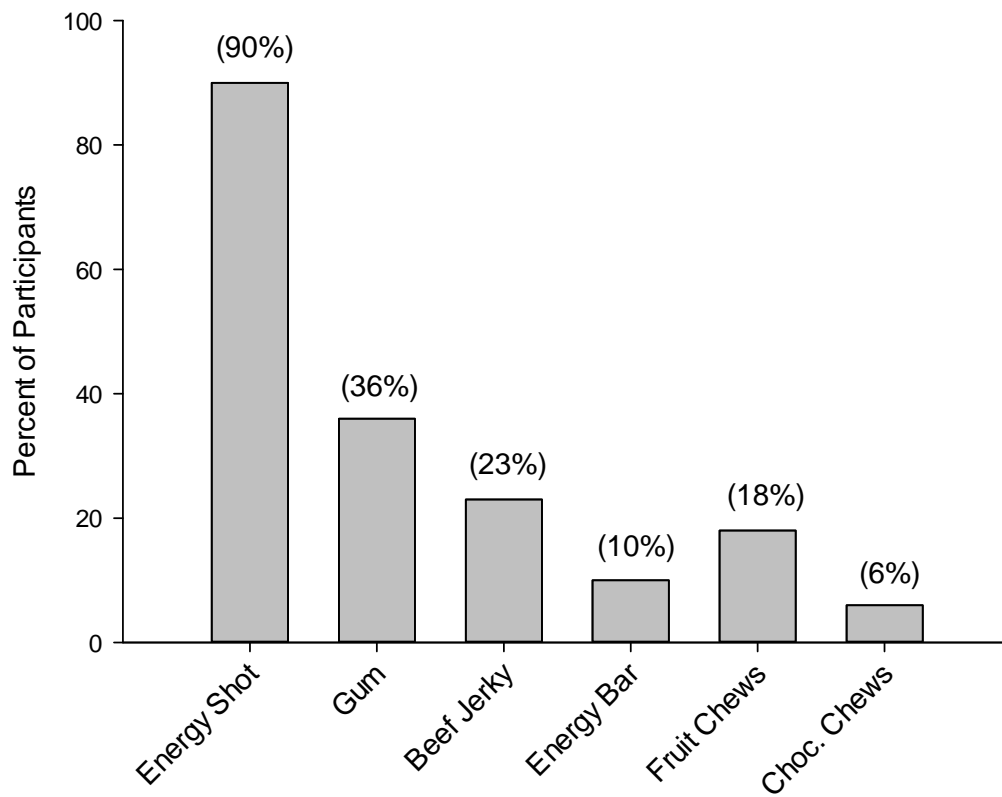


Figure 4. The total number of packages of each caffeine item selected during the Phase III 2-day self-select test. The values in parenthesis are the relative percent. n=62

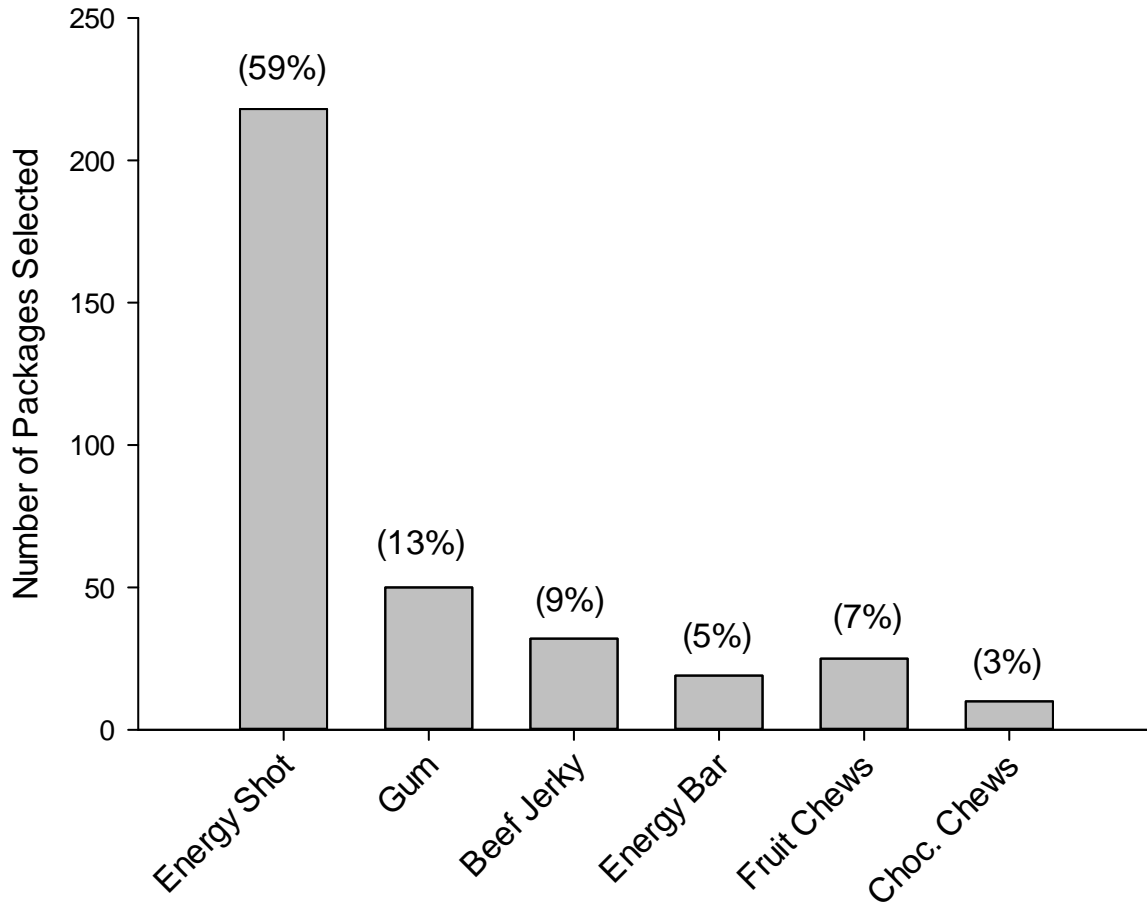


Figure 5. The number of caffeine doses/units consumed over the Phase III 2-day self-select test, sorted by caffeine product. N=62.

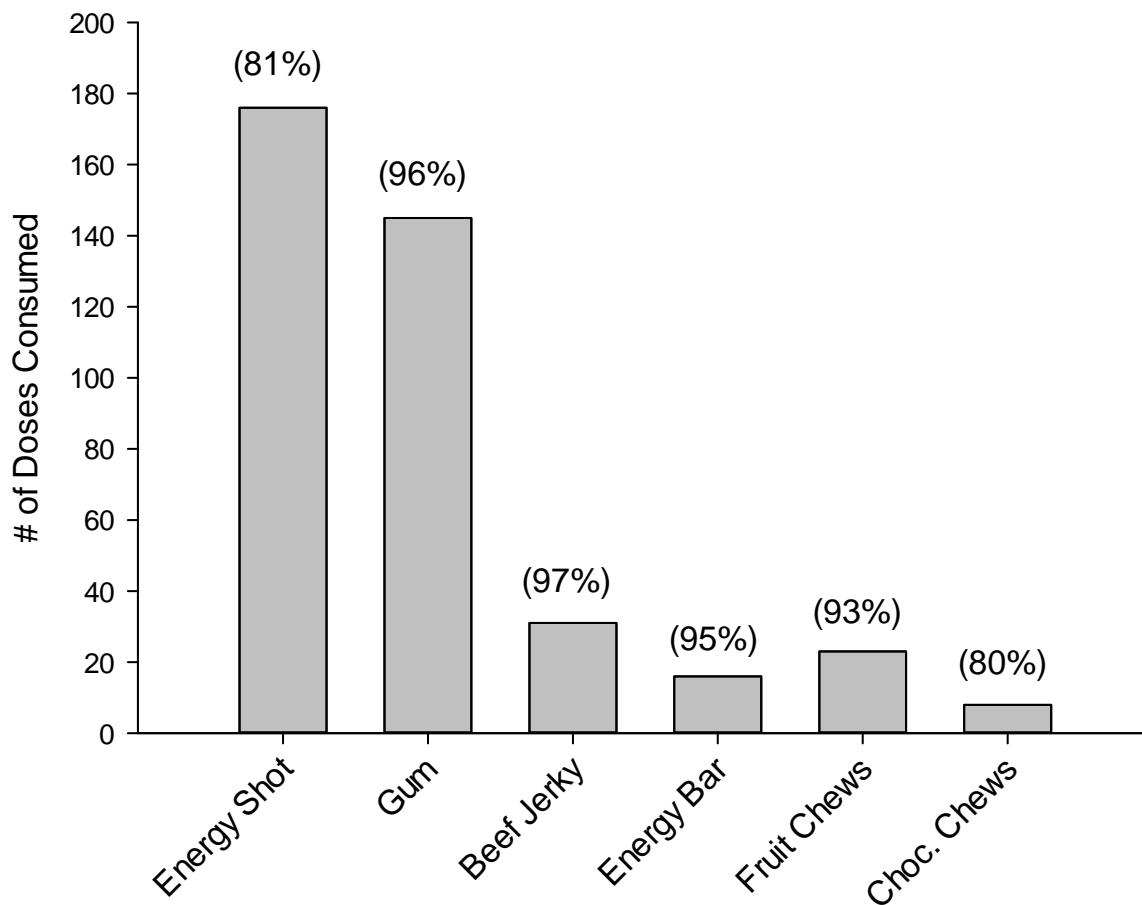


Figure 6. Attributes that made energy shot and caffeinated gum popular products during Phase III self-select tests.

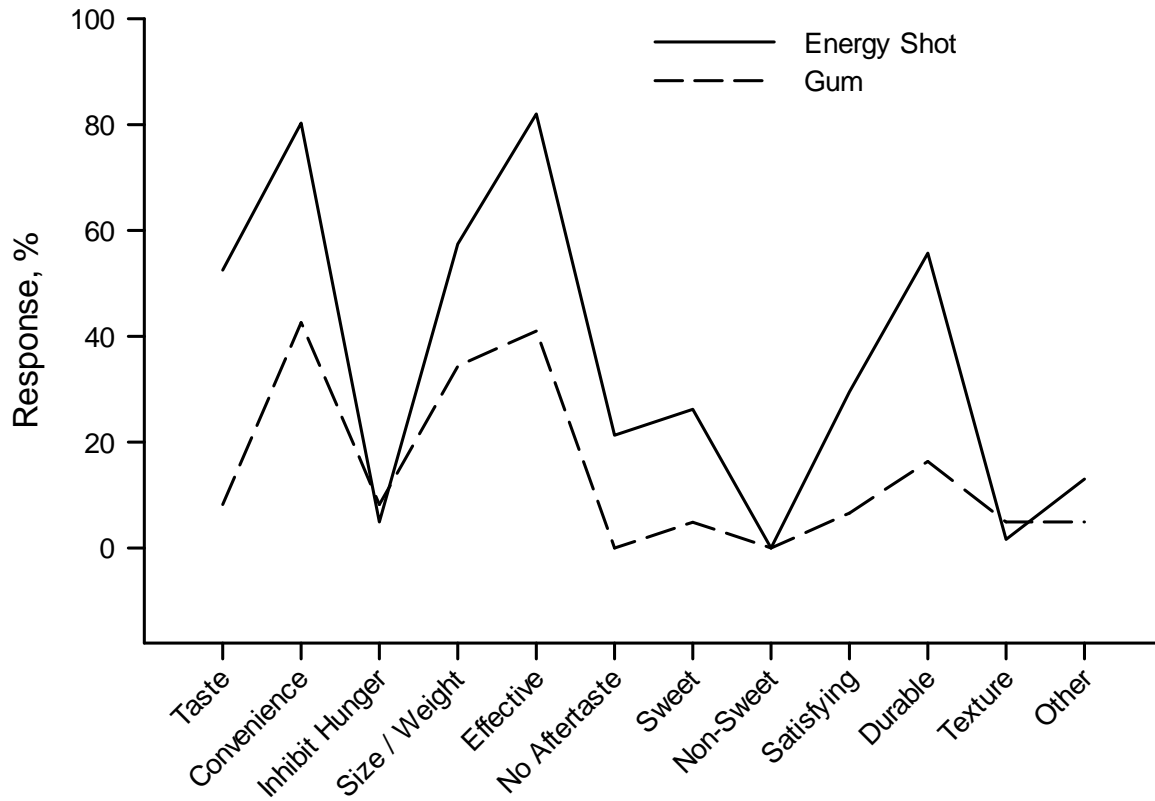
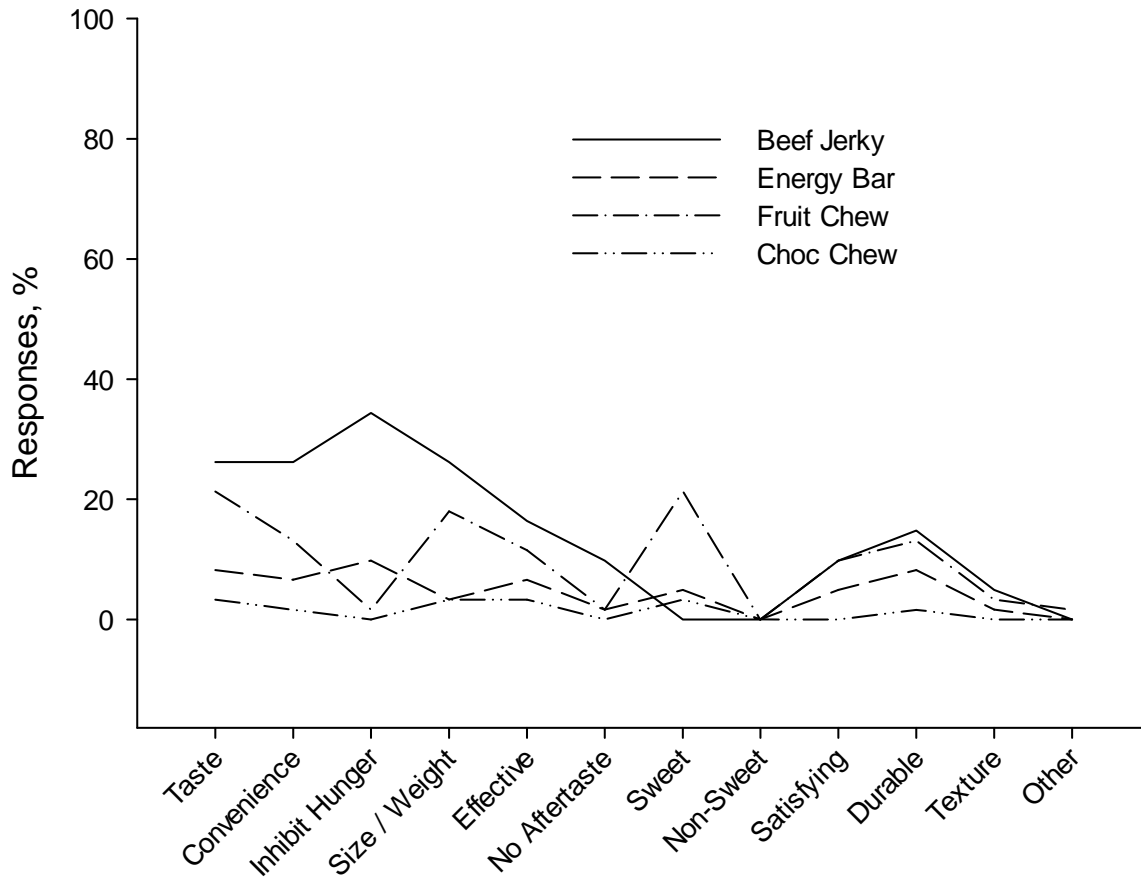


Figure 7. Attributes for beef jerky, energy bar, fruit chews, and chocolate chews that led to their consumption during Phase III self-select tests.



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APPENDIX A

Phase I Questionnaire

Caffeine Intake and Preference - Phase 1

The U.S. Army Research Institute of Environmental Medicine (USARIEM) is conducting a user field evaluation of caffeinated products. We are interested in your current use and experience with various caffeine products, and your thoughts on caffeine products for field rations. Even if you are not a regular caffeine user, we want your thoughts on how we should place caffeine in field rations. Participation in this research is strictly voluntary, you will not be identified in this research. Read each question carefully as some restrict the number of responses that you can put down for that question. Thank you for your participation.

MARKING INSTRUCTIONS	
<ul style="list-style-type: none"> • Use a No. 2 pencil only. • Do not use ink, ballpoint, or felt tip pens. • Make solid marks that fill the response completely. • Erase cleanly any marks you wish to change. • Make no stray marks on this form. 	
CORRECT:	INCORRECT:

MARKING EXAMPLE FOR AGE					
Below you will find an example of a question from this booklet. Please note the proper way to record your response if your answer was 19 years. Write the numbers 1 and 9 in the boxes and color in the corresponding bubbles.					
<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="padding: 2px 5px;">years</td> <td style="padding: 2px 5px; text-align: center;">1</td> </tr> <tr> <td style="padding: 2px 5px;"></td> <td style="padding: 2px 5px; text-align: center;">9</td> </tr> </table>	years	1		9	
years	1				
	9				

1. What is your gender:

Male
 Female

LOCATION

2. What is your age today?

Please write in your response in the blank boxes, then fill in the corresponding circles.

AGE	
years	

Do not write in this box
MOS_oth

3. What is your rank?

E	
O	
WO	

4. What is your "primary MOS":

<input type="radio"/> Infantry	<input type="radio"/> Transportation	<input type="radio"/> Signal	<input type="radio"/> Artillery
<input type="radio"/> Medical	<input type="radio"/> Cavalry	<input type="radio"/> Supply	<input type="radio"/> Food service
<input type="radio"/> Administration	<input type="radio"/> Military intelligence	<input type="radio"/> Engineer	<input type="radio"/> Other _____

5. Over the past 6 months, how often did you consume a beverage, vitamins/mineral, or supplement that contained any of the following ingredients? *(Please mark something for each row)*

	NEVER	NOT SURE	1 TIME MONTH	1 TIME WEEK	FEW TIMES WEEK (2-6)	DAILY
A. green tea extract	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
B. guarana	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
C. kola nut	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
D. yerba mate	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

NATICX FORM 2567 (One-Time) 25 NOV 2009

PLEASE DO NOT WRITE IN THIS AREA	[SERIAL]
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Caffeine Intake and Preference - Phase 1

CAFFEINE INSTRUCTIONS:

- 1) Indicate your serving size for each item you consume.
 - 2) Fill in the number of times you usually consume that item. If you do not consume an item, fill in "0" under TIMES column, leaving all other sections in that row blank.
 - 3) Fill in the bubble indicating the time period for the number of times you usually have that item in that amount.
 - 4) Do not record things like water, beer, milk, juice, and regular Gatorade, as these do not contain caffeine.
- For sodas: a can = 12 fl oz, vending plastic bottles = 20 fl oz, and a 2-liter bottle is 68 fl oz).
 Example: A person drinks an 8-fl oz mug of coffee, 2 times a day.

	8 fl oz	12 fl oz	16 fl oz	24+ fl oz	Times	Month	Year	Do not write in this box
COFFEE/TEA (caffeinated only)								
<i>EXAMPLE: Brewed Coffee, regular</i>								
Brewed Coffee (hot or cold).....								
Cappuccino.....								
Frozen blended coffee drink.....								
Hot brewed Tea.....								
Iced Tea.....								
Other coffee or tea.....								
Espresso (report number of shots).....								
SOFT DRINK (caffeinated only - Regular and diet)								
Cola-Type.....								
Coke Blak (coffee flavored Coke).....								
Pepsi MAX.....								
Pepper-Type (Dr. Pepper, Mr. PIBB, etc).....								
Mountain Dew/Mello Yello.....								
Vault soda.....								
Sunkist (just this brand).....								
Barg's Root Beer (regular only/just this brand)								
Other.....								
ENERGY BEVERAGES (Regular and diet)								
Number of cans/bottles								
AMP Energy Drink (16 fl oz can).....								
BAWLS Guarana (16 fl oz can).....								
Full Throttle (16 fl oz can).....								
Glaceau Vitaminwater Energy (20 fl oz bottle)								
Jolt (23.5 fl oz can).....								
Monster Energy Drink (16 fl oz can).....								
Red Bull Energy Drink (8.3 fl oz can).....								
Rock Star Energy Drink (16 fl oz can).....								
SoBe adrenaline sport drink (16 fl oz can)....								
SoBe Energy Citrus (16 fl oz can).....								
Tab Energy (10.5 fl oz can).....								
Other.....								
CAFFEINATED CANDY/MEDICATIONS/SUPPLEMENTS								
Number of pills/sticks of gum								
Jolt gum.....								
Stay Alert gum.....								
Vivarin/NoDoz Maximum.....								
NoDoz regular/Generic Caffeine pills.....								
Dexatrim or other weight control aids.....								
Bayer Headache Relief/Excedrin pills.....								
Other.....								

Caffeine Intake and Preference - Phase 1

7. How often have you eaten individual field rations before today?

Never Once Several times Many times

8. When in the field, on the average how many milligrams (mg) of caffeine per day do you consume including caffeinated products that you personally bring to the field? Make your best guess if you do not know.

For reference, an 8 fl oz mug of coffee is about 100 mg; 12 fl oz can of cola is about 40 mg.

None 100 mg 400 mg 700 mg
 200 mg 500 mg 800 mg
 300 mg 600 mg 900 or more mg

For the following three (3) questions, please mark all that apply. **FOR QUESTION 12, EVERYONE MUST PICK 3 CAFFEINATED PRODUCTS** (no more - no less) to help us narrow down the caffeinated items we will test in a follow-up study.

9. Which of the below products, the CAFFEINATED version, have you ever tried?

<input type="radio"/> None	<input type="radio"/> Beef Jerky	<input type="radio"/> Candy Bars	<input type="radio"/> Energy concentrated (~ 1 - 2 tsp/packet)	<input type="radio"/> Jelly Beans
	<input type="radio"/> Beverage - liquid form	<input type="radio"/> Chewy candies	<input type="radio"/> Energy shot (2 fl oz bottles)	<input type="radio"/> Lollipops
	<input type="radio"/> Beverage - powder mix	<input type="radio"/> Chewy chocolate	<input type="radio"/> Gels	<input type="radio"/> Mints
	<input type="radio"/> Beverage - tablets (dissolve in liquid to form energy drink)	<input type="radio"/> Chocolate covered espresso beans	<input type="radio"/> Gum	<input type="radio"/> Pudding
	<input type="radio"/> Breath spray	<input type="radio"/> Energy bar		<input type="radio"/> Sunflower Seed
	<input type="radio"/> Caffeine strips (dissolves on tongue)			<input type="radio"/> Other_____

10. Which of the CAFFEINATED products have you tried in the field?

<input type="radio"/> None	<input type="radio"/> Beef Jerky	<input type="radio"/> Candy Bars	<input type="radio"/> Energy concentrated (~ 1 - 2 tsp/packet)	<input type="radio"/> Jelly Beans
	<input type="radio"/> Beverage - liquid form	<input type="radio"/> Chewy candies	<input type="radio"/> Energy shot (2 fl oz bottles)	<input type="radio"/> Lollipops
	<input type="radio"/> Beverage - powder mix	<input type="radio"/> Chewy chocolate	<input type="radio"/> Gels	<input type="radio"/> Mints
	<input type="radio"/> Beverage - tablets (dissolve in liquid to form energy drink)	<input type="radio"/> Chocolate covered espresso beans	<input type="radio"/> Gum	<input type="radio"/> Pudding
	<input type="radio"/> Breath spray	<input type="radio"/> Energy bar		<input type="radio"/> Sunflower Seed
	<input type="radio"/> Caffeine strips (dissolves on tongue)			<input type="radio"/> Other_____

11. Which of the CAFFEINATED products tried in the field, performed acceptably in the field?

<input type="radio"/> None	<input type="radio"/> Beef Jerky	<input type="radio"/> Candy Bars	<input type="radio"/> Energy concentrated (~ 1 - 2 tsp/packet)	<input type="radio"/> Jelly Beans
	<input type="radio"/> Beverage - liquid form	<input type="radio"/> Chewy candies	<input type="radio"/> Energy shot (2 fl oz bottles)	<input type="radio"/> Lollipops
	<input type="radio"/> Beverage - powder mix	<input type="radio"/> Chewy chocolate	<input type="radio"/> Gels	<input type="radio"/> Mints
	<input type="radio"/> Beverage - tablets (dissolve in liquid to form energy drink)	<input type="radio"/> Chocolate covered espresso beans	<input type="radio"/> Gum	<input type="radio"/> Pudding
	<input type="radio"/> Breath spray	<input type="radio"/> Energy bar		<input type="radio"/> Sunflower Seed
	<input type="radio"/> Caffeine strips (dissolves on tongue)			<input type="radio"/> Other_____

12. Which of the CAFFEINATED products would you prefer when in the field? **PICK 3 PRODUCTS**

<input type="radio"/> Beef Jerky	<input type="radio"/> Candy Bars	<input type="radio"/> Energy concentrated (~ 1 - 2 tsp/packet)	<input type="radio"/> Jelly Beans
<input type="radio"/> Beverage - liquid form	<input type="radio"/> Chewy candies	<input type="radio"/> Energy shot (2 fl oz bottles)	<input type="radio"/> Lollipops
<input type="radio"/> Beverage - powder mix	<input type="radio"/> Chewy chocolate	<input type="radio"/> Gels	<input type="radio"/> Mints
<input type="radio"/> Beverage - tablets (dissolve in liquid to form energy drink)	<input type="radio"/> Chocolate covered espresso beans	<input type="radio"/> Gum	<input type="radio"/> Pudding
<input type="radio"/> Breath spray	<input type="radio"/> Energy bar		<input type="radio"/> Sunflower Seed
<input type="radio"/> Caffeine strips (dissolves on tongue)			<input type="radio"/> Other_____

Caffeine Intake and Preference - Phase 1

In the next 3 questions, pretend you are developing a "perfect" field ration for ONE FULL DAY (24 HOURS). You empty out 24 HOURS worth of ration items into a single box (example: 3 MREs or 1 FSR). With all ration items in front of you, your task is to add caffeine in the dose (mg) and items you prefer to get you through 24 HOURS in the field. The only rule is your ration **MUST** contain caffeinated products.

13. For your 24 HOUR ration, how many milligrams (mg) of caffeine do you think it should contain? *You must choose only one option. For reference, an 8 fl oz mug of coffee ~100 mg; 12 fl oz can of cola ~40 mg.*

<input type="radio"/> 100 mg	<input type="radio"/> 300 mg	<input type="radio"/> 500 mg	<input type="radio"/> 700 mg	<input type="radio"/> 900
<input type="radio"/> 200 mg	<input type="radio"/> 400 mg	<input type="radio"/> 600 mg	<input type="radio"/> 800 mg	<input type="radio"/> 1000 or more mg

14. How many caffeinated items would you like your 24 HOUR ration to contain?

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

15. Now we want to know what type of caffeinated items you would like in this 24 HOUR ration. Look back at question 14, how many items did you choose _____? Take this number and break it down into the four categories below (food, beverage, candy, and accessory). You can place your caffeine all in one category or divide it up between all four categories - it is all up to you. Just make sure your total number of items matches the number you selected in question 14.

<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9 <input type="radio"/> 10 <input type="radio"/> 11 <input type="radio"/> 12 <input type="radio"/> 13 <input type="radio"/> 14 <input type="radio"/> 15 <input type="radio"/> 16 <input type="radio"/> 17 <input type="radio"/> 18 <input type="radio"/> 19 <input type="radio"/> 20 <input type="radio"/> 21 <input type="radio"/> 22 <input type="radio"/> 23 <input type="radio"/> 24	Caffeinated <u>FOOD</u> based items (such as Jerky, gels, energy bar, pudding, and sunflower seeds)
<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9 <input type="radio"/> 10 <input type="radio"/> 11 <input type="radio"/> 12 <input type="radio"/> 13 <input type="radio"/> 14 <input type="radio"/> 15 <input type="radio"/> 16 <input type="radio"/> 17 <input type="radio"/> 18 <input type="radio"/> 19 <input type="radio"/> 20 <input type="radio"/> 21 <input type="radio"/> 22 <input type="radio"/> 23 <input type="radio"/> 24	Caffeinated <u>BEVERAGE</u> items (Do not include energy shots in this category - they are under Accessories)
<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9 <input type="radio"/> 10 <input type="radio"/> 11 <input type="radio"/> 12 <input type="radio"/> 13 <input type="radio"/> 14 <input type="radio"/> 15 <input type="radio"/> 16 <input type="radio"/> 17 <input type="radio"/> 18 <input type="radio"/> 19 <input type="radio"/> 20 <input type="radio"/> 21 <input type="radio"/> 22 <input type="radio"/> 23 <input type="radio"/> 24	Caffeinated <u>CANDY</u> items (candy bar, chewy candies or chocolates, choc. covered coffee beans, jelly beans, or lollipops)
<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9 <input type="radio"/> 10 <input type="radio"/> 11 <input type="radio"/> 12 <input type="radio"/> 13 <input type="radio"/> 14 <input type="radio"/> 15 <input type="radio"/> 16 <input type="radio"/> 17 <input type="radio"/> 18 <input type="radio"/> 19 <input type="radio"/> 20 <input type="radio"/> 21 <input type="radio"/> 22 <input type="radio"/> 23 <input type="radio"/> 24	Caffeinated <u>ACCESSORY</u> based items (caffeinated breath spray, strips, energy concentrate/shots, gum, or mints)

16. Add up the number of items in the four categories, from question 15. What is that number _____? Does this match the number in question 14? If not, please go back and revise your answers in question 15 until they add up.

Yes they match

Do not write in this box

Q9_oth	Q10_oth	Q11_oth	Q12_oth
--------	---------	---------	---------

PLEASE DO NOT WRITE IN THIS AREA	[SERIAL]
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APPENDIX B Phase II Questionnaires and Daily Record

Garrison Caffeine Sampling - Phase 2.1

SUBJECT
NUMBER _____

The U.S. Army Research Institute for Environmental Medicine (USARIEM) is conducting limited user field evaluations of various caffeinated products for possible addition to field rations. You will be given 10 products to sample during the next 5 days. Thank you for your participation.

• Use a No. 2 pencil only.
 • Do not use ink, ballpoint, or felt tip pens.
 • Make solid marks that fill the response completely.
 • Erase cleanly any marks you wish to change.
 • Make no stray marks on this form.

CORRECT: ● INCORRECT: ○

Below you will find an example of a question from this booklet. Please note the proper way to record your response if your answer was 19 years. Write the numbers 1 and 9 in the boxes and color in the corresponding bubbles.

years	1	●
	9	●

1. What is your gender:

Male
 Female

2. What is your age to day? (see example for help in filling out the bubbles)

Please write in your response in the blank boxes, then fill in the corresponding circles.

AGE	
years	

Do not write in this box

MOS_0th

3. What is your rank?

E	
O	
WO	

4. What is your "primary MOS":

<input type="radio"/> Infantry	<input type="radio"/> Transportation	<input type="radio"/> Signal	<input type="radio"/> Artillery
<input type="radio"/> Medical	<input type="radio"/> Cavalry	<input type="radio"/> Supply	<input type="radio"/> Food service
<input type="radio"/> Administration	<input type="radio"/> Military intelligence	<input type="radio"/> Engineer	<input type="radio"/> Other _____

5. In the past 6 months, have you consume any of the following:

(Please mark all that apply)

NEVER or NOT VERY ALWAYS/
 HARDLY SURE OFTEN ALMOST
 DAILY

vitamins/minerals supplements

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
-----------------------	-----------------------	-----------------------	-----------------------

6. Over the past 6 months, how often did you consume a beverage, vitamin/mineral, or supplement that contained any of the following ingredients? (Please mark something for each row)

	NEVER	NOT SURE	1 TIME MONTH	1 TIME WEEK	FEW TIMES WEEK (2-4)	DAILY
A. green tea extract	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
B. guarana	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
C. kola nut	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
D. yerba mate	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

NATICK FORM XXXX
(One-Time) XX JUNE 2009

■
Garrison Caffeine Intake -Phase 2.1

CAFFEINE INSTRUCTIONS:

- 1) Indicate your serving size for each item you consume.
- 2) Fill in the number of times you usually consume that item. If you do not consume an item, fill in "0" under TIMES column, leaving all other sections in that row blank.
- 3) Fill in the bubble indicating the time period for the number of times you usually have that item in that amount.
- 4) Do not record things like water, beer, milk, juice, and regular Gatorade, as these do not contain caffeine.

For sodas: a can = 12 fl oz, vending plastic bottles = 20 fl oz, and a 2-liter bottle is 68 fl oz).

Example: A person drinks an 8-fl oz mug of coffee, 2 times a day.

	8 fl oz	16 fl oz	20 fl oz	24 fl oz	-- Times --		Week	Month	Year
COFFEE/TEA (caffeinated only)									
<i>EXAMPLE: Brewed Coffee, regular</i>									
Brewed Coffee (hot or cold).....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cappuccino.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Frozen blended coffee drink.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Hot brewed Tea.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Iced Tea.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other coffee or tea.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Espresso (report number of shots).....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SOFT DRINK (caffeinated only - Regular and diet)									
Cola-Type.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Coke Blak (coffee flavored Coke).....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pepsi MAX.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pepper-Type (Dr. Pepper, Mr. PIBB, etc).....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Mountain Dew/Mello Yello.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Vault soda.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sunkist (just this brand).....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Barq's Root Beer (regular only/just this brand)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ENERGY BEVERAGES (Regular and diet)									
AMP Energy Drink (16 fl oz can).....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
BAWLS Guarana (16 fl oz can).....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Full Throttle (16 fl oz can).....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Glacéau Vitaminwater Energy (20 fl oz bottle)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Jolt (23.5 fl oz can).....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Monster Energy Drink (16 fl oz can).....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Red Bull Energy Drink (8.3 fl oz can).....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Rock Star Energy Drink (16 fl oz can).....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SoBe adrenaline sport drink (16 fl oz can)....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SoBe Energy Citrus (16 fl oz can).....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tab Energy (10.5 fl oz can).....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CAFFEINATED CANDY/MEDICATIONS/SUPPLEMENTS									
Jolt gum.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Stay Alert gum.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Vivarin/NoDoz Maximum.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
NoDoz regular/Generic Caffeine pills.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Dexatrim or other weight control aids.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bayer Headache Relief/Excedrin pills.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Do not write
in this box

Garrison Caffeine Intake -Phase 2.1

8. When in the field, on the average how many milligrams (mg) of caffeine per day do you consume including caffeinated products that you personally bring to the field? Make your best guess if you do not know.

For reference, an 8 fl oz mug of coffee is about 100 mg; 12 fl oz can of cola is about 40 mg.

- | | | | |
|----------------------------|------------------------------|------------------------------|--------------------------------------|
| <input type="radio"/> None | <input type="radio"/> 100 mg | <input type="radio"/> 400 mg | <input type="radio"/> 700 mg |
| <input type="radio"/> | <input type="radio"/> 200 mg | <input type="radio"/> 500 mg | <input type="radio"/> 800 mg |
| <input type="radio"/> | <input type="radio"/> 300 mg | <input type="radio"/> 600 mg | <input type="radio"/> 900 or more mg |

For the following three (3) questions, please mark all that apply. **FOR QUESTION 12, EVERYONE MUST PICK 3 CAFFEINATED PRODUCTS** (no more - no less) to help us narrow down the caffeinated items we will test in a follow-up study.

9. Which of the below products, the CAFFEINATED version, have you ever tried?

- | | | | | |
|-------------------------------|---|---|---|---|
| <input type="checkbox"/> None | <input type="checkbox"/> Beef Jerky | <input type="checkbox"/> Candy Bars | <input type="checkbox"/> Energy concentrated (~ 1 - 2 tsp/packet) | <input type="checkbox"/> Jelly Beans |
| | <input type="checkbox"/> Beverage - liquid form | <input type="checkbox"/> Chewy candies | <input type="checkbox"/> Energy shot (2 fl oz bottles) | <input type="checkbox"/> Lollipops |
| | <input type="checkbox"/> Beverage - powder mix | <input type="checkbox"/> Chewy chocolate | <input type="checkbox"/> Gels | <input type="checkbox"/> Mints |
| | <input type="checkbox"/> Beverage - tablets (dissolve in liquid to form energy drink) | <input type="checkbox"/> Chocolate covered espresso beans | <input type="checkbox"/> Gum | <input type="checkbox"/> Pudding |
| | <input type="checkbox"/> Breath spray | <input type="checkbox"/> Energy bar | | <input type="checkbox"/> Sunflower Seed |
| | <input type="checkbox"/> Caffeine strips (dissolves on tongue) | | | <input type="checkbox"/> Other _____ |

10. Which of the CAFFEINATED products have you tried in the field?

- | | | | | |
|-------------------------------|---|---|---|---|
| <input type="checkbox"/> None | <input type="checkbox"/> Beef Jerky | <input type="checkbox"/> Candy Bars | <input type="checkbox"/> Energy concentrated (~ 1 - 2 tsp/packet) | <input type="checkbox"/> Jelly Beans |
| | <input type="checkbox"/> Beverage - liquid form | <input type="checkbox"/> Chewy candies | <input type="checkbox"/> Energy shot (2 fl oz bottles) | <input type="checkbox"/> Lollipops |
| | <input type="checkbox"/> Beverage - powder mix | <input type="checkbox"/> Chewy chocolate | <input type="checkbox"/> Gels | <input type="checkbox"/> Mints |
| | <input type="checkbox"/> Beverage - tablets (dissolve in liquid to form energy drink) | <input type="checkbox"/> Chocolate covered espresso beans | <input type="checkbox"/> Gum | <input type="checkbox"/> Pudding |
| | <input type="checkbox"/> Breath spray | <input type="checkbox"/> Energy bar | | <input type="checkbox"/> Sunflower Seed |
| | <input type="checkbox"/> Caffeine strips (dissolves on tongue) | | | <input type="checkbox"/> Other _____ |

11. Which of the CAFFEINATED products tried in the field, performed acceptably in the field?

- | | | | | |
|-------------------------------|---|---|---|---|
| <input type="checkbox"/> None | <input type="checkbox"/> Beef Jerky | <input type="checkbox"/> Candy Bars | <input type="checkbox"/> Energy concentrated (~ 1 - 2 tsp/packet) | <input type="checkbox"/> Jelly Beans |
| | <input type="checkbox"/> Beverage - liquid form | <input type="checkbox"/> Chewy candies | <input type="checkbox"/> Energy shot (2 fl oz bottles) | <input type="checkbox"/> Lollipops |
| | <input type="checkbox"/> Beverage - powder mix | <input type="checkbox"/> Chewy chocolate | <input type="checkbox"/> Gels | <input type="checkbox"/> Mints |
| | <input type="checkbox"/> Beverage - tablets (dissolve in liquid to form energy drink) | <input type="checkbox"/> Chocolate covered espresso beans | <input type="checkbox"/> Gum | <input type="checkbox"/> Pudding |
| | <input type="checkbox"/> Breath spray | <input type="checkbox"/> Energy bar | | <input type="checkbox"/> Sunflower Seed |
| | <input type="checkbox"/> Caffeine strips (dissolves on tongue) | | | <input type="checkbox"/> Other _____ |

12. Which of the CAFFEINATED products would you prefer when in the field? **PICK 3 PRODUCTS**

- | | | | | |
|--------------------------|---|---|---|---|
| <input type="checkbox"/> | <input type="checkbox"/> Beef Jerky | <input type="checkbox"/> Candy Bars | <input type="checkbox"/> Energy concentrated (~ 1 - 2 tsp/packet) | <input type="checkbox"/> Jelly Beans |
| <input type="checkbox"/> | <input type="checkbox"/> Beverage - liquid form | <input type="checkbox"/> Chewy candies | <input type="checkbox"/> Energy shot (2 fl oz bottles) | <input type="checkbox"/> Lollipops |
| <input type="checkbox"/> | <input type="checkbox"/> Beverage - powder mix | <input type="checkbox"/> Chewy chocolate | <input type="checkbox"/> Gels | <input type="checkbox"/> Mints |
| <input type="checkbox"/> | <input type="checkbox"/> Beverage - tablets (dissolve in liquid to form energy drink) | <input type="checkbox"/> Chocolate covered espresso beans | <input type="checkbox"/> Gum | <input type="checkbox"/> Pudding |
| <input type="checkbox"/> | <input type="checkbox"/> Breath spray | <input type="checkbox"/> Energy bar | | <input type="checkbox"/> Sunflower Seed |
| <input type="checkbox"/> | <input type="checkbox"/> Caffeine strips (dissolves on tongue) | | | <input type="checkbox"/> Other _____ |

Garrison Caffeine Sampling - Phase 2 Daily Record

SUBJECT NUMBER _____

The U.S. Army Research Institute for Environmental Medicine (USARIEM) is conducting limited user field evaluations of various caffeinated products for possible addition to field rations. You have been given 10 products to sample during the next couple days. Based on the products that **YOU RECEIVED**, please provide us feedback on what you liked or disliked. Thank you for your participation.



Please let us know which products you received and on which day(s) you actually tried the product. Mark the "X" if you received the product but did not try it.

Using the scale below, please rate how much you liked or disliked the products you tried during this study, for the following categories: **TASTE, SERVING SIZE, HOW EASY IT WAS TO CONSUME, AND OVERALL.** 1 = Dislike Extremely TO 7 = Like Extremely

	RECEIVED PRODUCT	DAY TRIED	TASTE	SERVING SIZE	EASY TO CONSUME	PRODUCT OVERALL
■ A. 5-Hr Energy, shots	X	1	1-7	1-7	1-7	1-7
B. Alien Energy, beef jerky			1-7	1-7	1-7	1-7
C. Atomic Energy Bites, candy			1-7	1-7	1-7	1-7
■ D. Buzz Bites, chewy choc.			1-7	1-7	1-7	1-7
E. FIXX Energy Packet			1-7	1-7	1-7	1-7
F. FSR Bar, energy bar			1-7	1-7	1-7	1-7
G. Rocket Choc, candy bar			1-7	1-7	1-7	1-7
H. Stay Alert, gum			1-7	1-7	1-7	1-7
I. Sum Seeds, sunflower			1-7	1-7	1-7	1-7
J. ZipFizz, bev powder mix			1-7	1-7	1-7	1-7

If the taste, package serving amount, ease to consume, or overall product is **DISLIKED** why?
(record on back)

Did you have any negative side effects to the products?

	YES	NO	NOT SURE
A. 5-Hr Energy, shots			
B. Alien Energy, beef jerky			
C. Atomic Energy Bites, candy			
D. Buzz Bites, chewy choc.			
E. FIXX Energy Packet			
F. FSR Bar, energy bar			
G. Rocket Choc, candy bar			
H. Stay Alert, gum			
I. Sum Seeds, sunflower			
J. ZipFizz, bev powder mix			

*If YES what were the side effects? (record on back)

Additional COMMENTS on the products you tried:



comments_overall



If taste is **DISLIKED** which product(s) and why?

If the packaging is **DISLIKED** which product(s) and why?

If the usability **didn't work out** which product(s) and why?

If the overall product is **DISLIKED** which product(s) and why?

If YES which product(s) and what were the side effects?

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dislike_taste

dislike_packaging

dislike_usability

dislike_overall

side_effects





Garrison Caffeine Sampling - Phase 2.2

The U.S. Army Research Institute for Environmental Medicine (USARIEM) is conducting limited user field evaluations of various caffeinated products for possible addition to field rations. You were given 10 caffeinated products to sample during the past 5 days. Based on the products that **YOU RECEIVED and TRIED**, please provide us feedback on what you liked or disliked. Thank you for your participation. Use the back side of this paper to add any additional comments you might have.

MARKING INSTRUCTIONS	VOLUNTEER NUMBER			
<ul style="list-style-type: none"> • Use a No. 2 pencil only. • Do not use ink, ballpoint, or felt tip pens. • Make solid marks that fill the response completely. • Erase cleanly any marks you wish to change. • Make no stray marks on this form. <p>CORRECT: INCORRECT: </p>	<table border="1"> <tr><td> </td></tr> <tr><td> </td></tr> <tr><td> </td></tr> </table>			

1. Would this item be a valuable addition to your field rations?

YES NO NOT SURE

2. Would you eat this item if it were available in your field rations?

YES NO NOT SURE

A. 5-Hr Energy, shots	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
B. Alien Energy, beef jerky	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
C. Atomic Energy Bites, candy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
D. Buzz Bites, chewy choc.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
E. FIXX Energy Packet	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
F. FSR Bar, energy bar	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
G. Rocket Choc, candy bar	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
H. Stay Alert, gum	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I. Sum Seeds, sunflower	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
J. ZipFizz, bev powder mix	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

3. Using the scale below, please rate how likely you would be to use the products during field training.

1-Extremely Unlikely 9-Extremely Likely

4. Please pick the TOP 5 PRODUCTS and rank them from 1 (like best) to 5 (like the least). Make sure you use each number ONLY ONCE.

TOP 5 RANKING

A. 5-Hr Energy, shots	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
B. Alien Energy, beef jerky	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
C. Atomic Energy Bites, candy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
D. Buzz Bites, chewy choc.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
E. FIXX Energy Packet	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
F. FSR Bar, energy bar	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
G. Rocket Choc, candy bar	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
H. Stay Alert, gum	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I. Sum Seeds, sunflower	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
J. ZipFizz, bev powder mix	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Field Caffeine Intake - Phase 3

Last 4 SSN _____

The U.S. Army Research Institute for Environmental Medicine (USARIEM) is conducting limited user field evaluations of a caffeinated product for possible addition to field rations. We are interested in your thoughts on the products that you received and tried.

1. Using the scale below, please rate how much you liked the packaging of the product while in the field.

1b. If the packaging was disliked, what was the problem?

	1=Dislike Extremely	7=Like Extremely	TOO SLUICKY	NOT DURABLE	HARD TO OPEN	OTHER
A. 5-Hr Energy, shots	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
B. Lightening Rod, beef jerky	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
C. FSR Bar, energy bar	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
D. Rocket Choc, candy bar	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
E. Buzz Bites, chewy choc.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
F. Atomic Energy Bites, candy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
G. Stay Alert, gum	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

2. Using the scale below, please rate how satisfied you were with the DURABILITY of the product while in the field.

If the product was NOT durable (rating of 1-3), why not?

	1=Extremely dissatisfied	7=Extremely satisfied
A. 5-Hr Energy, shots	<input type="radio"/>	<input type="radio"/>
B. Lightening Rod, beef jerky	<input type="radio"/>	<input type="radio"/>
C. FSR Bar, energy bar	<input type="radio"/>	<input type="radio"/>
D. Rocket Choc, candy bar	<input type="radio"/>	<input type="radio"/>
E. Buzz Bites, chewy choc.	<input type="radio"/>	<input type="radio"/>
F. Atomic Energy Bites, candy	<input type="radio"/>	<input type="radio"/>
G. Stay Alert, gum	<input type="radio"/>	<input type="radio"/>

3. Would this item be a valuable addition to your field rations?

4. Would you eat this item if it were available in your field rations?

	YES	NO	NOT SURE	YES	NO	NOT SURE
A. 5-Hr Energy, shots	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
B. Lightening Rod, beef jerky	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
C. FSR Bar, energy bar	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
D. Rocket Choc, candy bar	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
E. Buzz Bites, chewy choc.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
F. Atomic Energy Bites, candy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
G. Stay Alert, gum	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Field Caffeine Intake - Phase 3

5. Using the scale below, please rate how likely you would be to use the products during field training.

6. Now that you have used the products in the field, please rate how desirable each product would be for garrison training.

	1-Extremely Unlikely	7-Extremely Likely	1-Extremely desirable	7-Extremely desirable
A. 5-Hr Energy, shots	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
B. Lightening Rod, beef jerky	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
C. FSR Bar, energy bar	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
D. Rocket Choc, candy bar	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
E. Buzz Bites, chewy choc.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
F. Atomic Energy Bites, candy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
G. Stay Alert, gum	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

7. Of the items that you received, please pick the top 3 products and rank them from 1 (like the best) to 3 (like the least). Make sure you use each number **ONLY ONCE**. Four lines will be blank.

8. For each of the top 3 products that you picked, how many flavors should be available in the system?

A. 5-Hr Energy, shots	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
B. Lightening Rod, beef jerky	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
C. FSR Bar, energy bar	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
D. Rocket Choc, candy bar	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
E. Buzz Bites, chewy choc.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
F. Atomic Energy Bites, candy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
G. Stay Alert, gum	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

9. On days 3 and 4 you got to pick your 3 caffeine products for the day. Why did you choose those products (choose all that apply)?

	TASTE	HELPED W/ HUNGER	CONVENIENT	SIZE/WEIGHT	EFFECTIVE	NO AFTER TASTE	SWEET	NON SWEET	SATISFYING	DURABLE	TEXTURE	OTHER
A. 5-Hr Energy, shots.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B. Lightening Rod, beef jerky..	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
C. FSR Bar, energy bar.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
D. Rocket Choc, candy bar....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
E. Buzz Bites, chewy choc.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
F. Atomic Energy Bites, candy..	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
G. Stay Alert, gum.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Field Caffeine Intake - Phase 3

In the next 7 questions, pretend you are developing a "perfect" **field ration for ONE FULL DAY (24 HOURS)**. You empty out 24 HOURS worth of ration items into a single box (example: 3 MREs or 1 FSR). With all ration items in front of you, your task is to add caffeine in the dose (mg) and items you prefer to get you through 24 HOURS in the field. The only rule is your ration **MUST** contain caffeinated products.

10. For your 24 HOUR ration, how many milligrams (mg) of caffeine do you think it should contain? *You must choose only one option. For reference, an 8 fl oz mug of coffee ~100 mg; 12 fl oz can of cola ~40 mg.*

- 100 mg 300 mg 500 mg 700 mg 900
 200 mg 400 mg 600 mg 800 mg 1000 or more mg

11. How many caffeinated items would you like your 24 HOUR ration to contain?

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50

12. Now we want to know what type of caffeinated items you would like in this 24 HOUR ration. Look back at question 11, how many items did you choose _____? Take this number and break it down into the four categories below (food, beverage, candy, and accessory). You can place all your caffeine in one category or divide it up between the four categories - it is all up to you. Just make sure your total number of items matches the number you selected in #11.

- 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 **Caffeinated FOOD based items**
(such as Jerky, gels, energy bar, pudding, and sunflower seeds)
- 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 **Caffeinated BEVERAGE items**
(Do not include energy shots in this category - they are under Accessories)
- 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 **Caffeinated CANDY items**
(candy bar, chewy candies or chocolates, choc. covered coffee beans, jelly beans, or lollipops)
- 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 **Caffeinated ACCESSORY based items**
(caffeinated breath spray, strips, energy concentrate/shots, gum, or mints)

13. **If you selected more than ONE item in the FOOD category, tell us what combination you would want for your 24 HOUR ration:**

- Only one item-type (i.e. pudding), but multiple numbers of that one type
 Variety of items (i.e. pudding and Beef Jerky)

14. **If you selected more than ONE item in the BEVERAGE category, tell us what combination you would want for your 24 HOUR ration:**

- Only one item-type (i.e. coffee), but multiple numbers of that one type
 Variety of items (i.e. coffee, powder energy drink)

15. **If you selected more than ONE item in the CANDY category, tell us what combination you would want for your 24 HOUR ration:**

- Only one item-type (i.e. candy bar), but multiple numbers of that one type
 Variety of items (i.e. chewy candies, chocolate covered coffee beans)

16. **If you selected more than ONE item in the ACCESSORY category, tell us what combination you would want for your 24 HOUR ration:**

- Only one item-type (i.e. caffeinated breath spray), but multiple numbers of that one type
 Variety of items (i.e. caffeinated strips, mints)