

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 (≥ 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.

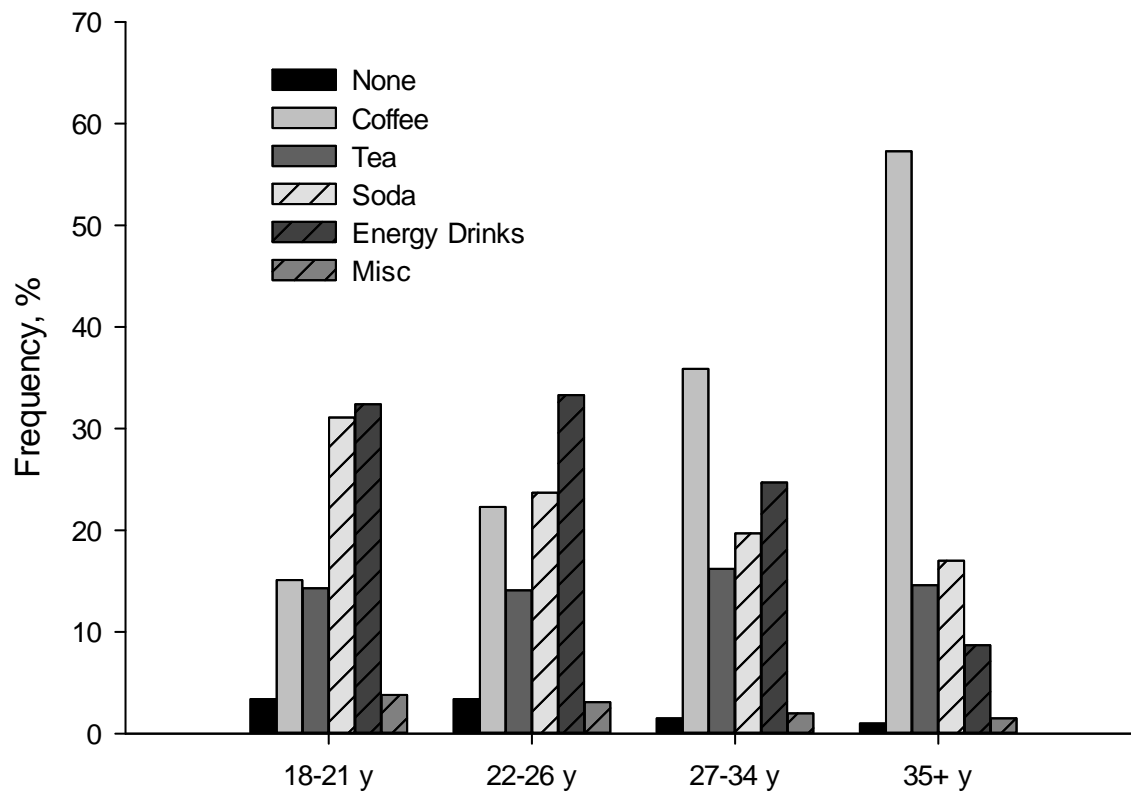


Figure 2. Caffeine product types recommended by Phase I respondents for field consideration sorted by frequency they were recommended.

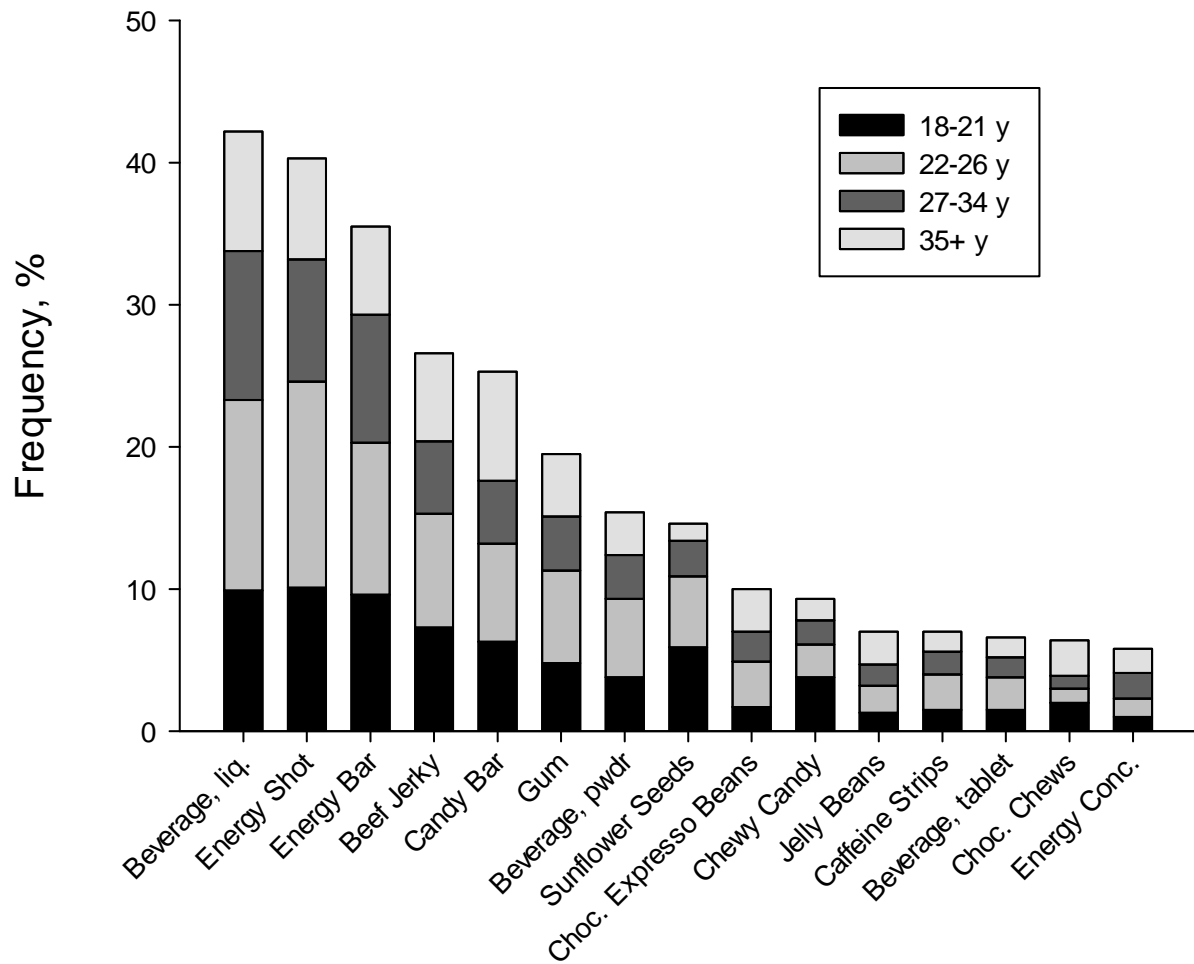


Figure 3. Percent of participants selecting the caffeinated products during Phase III self-select test (2-day average). N=62.

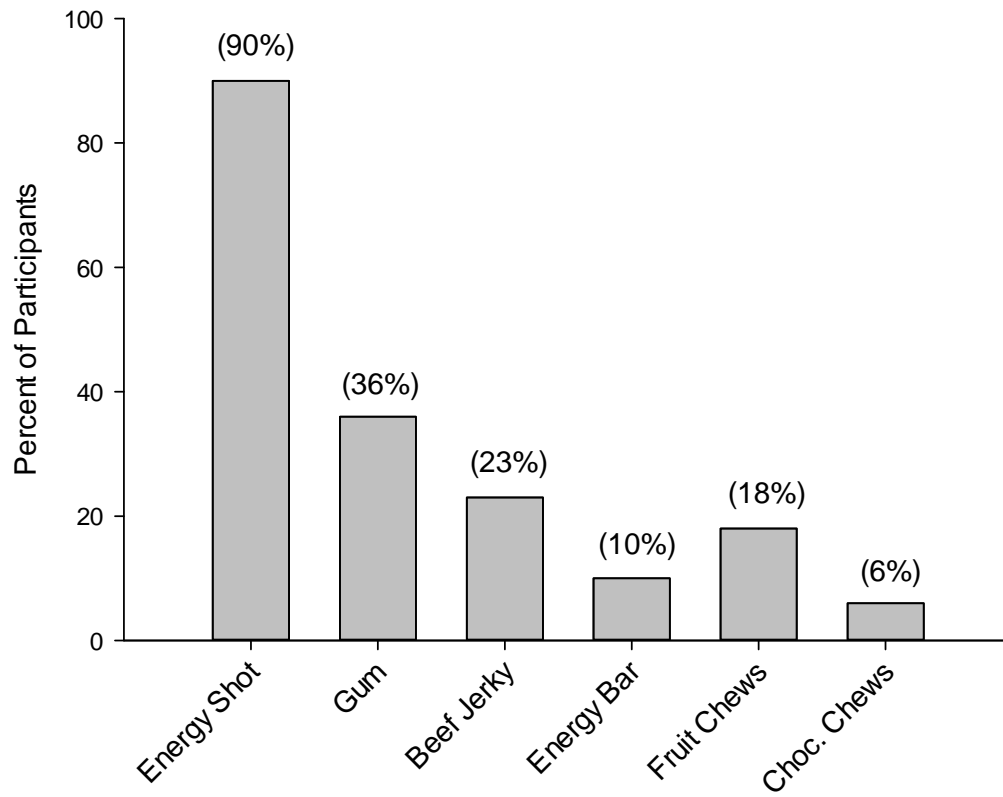


Figure 4. The total number of packages of each caffeine item selected during the Phase III 2-day self-select test. The values in parenthesis are the relative percent. n=62

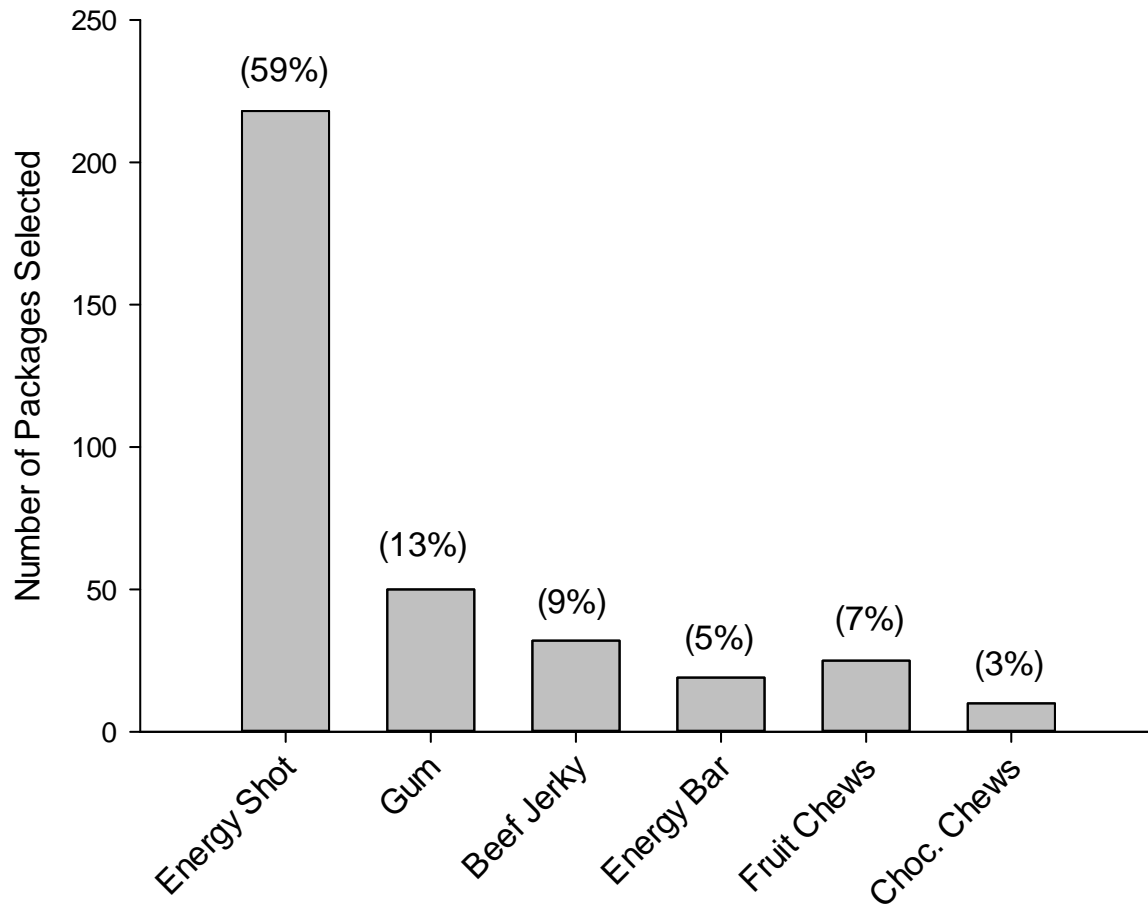


Figure 5. The number of caffeine doses/units consumed over the Phase III 2-day self-select test, sorted by caffeine product. N=62.

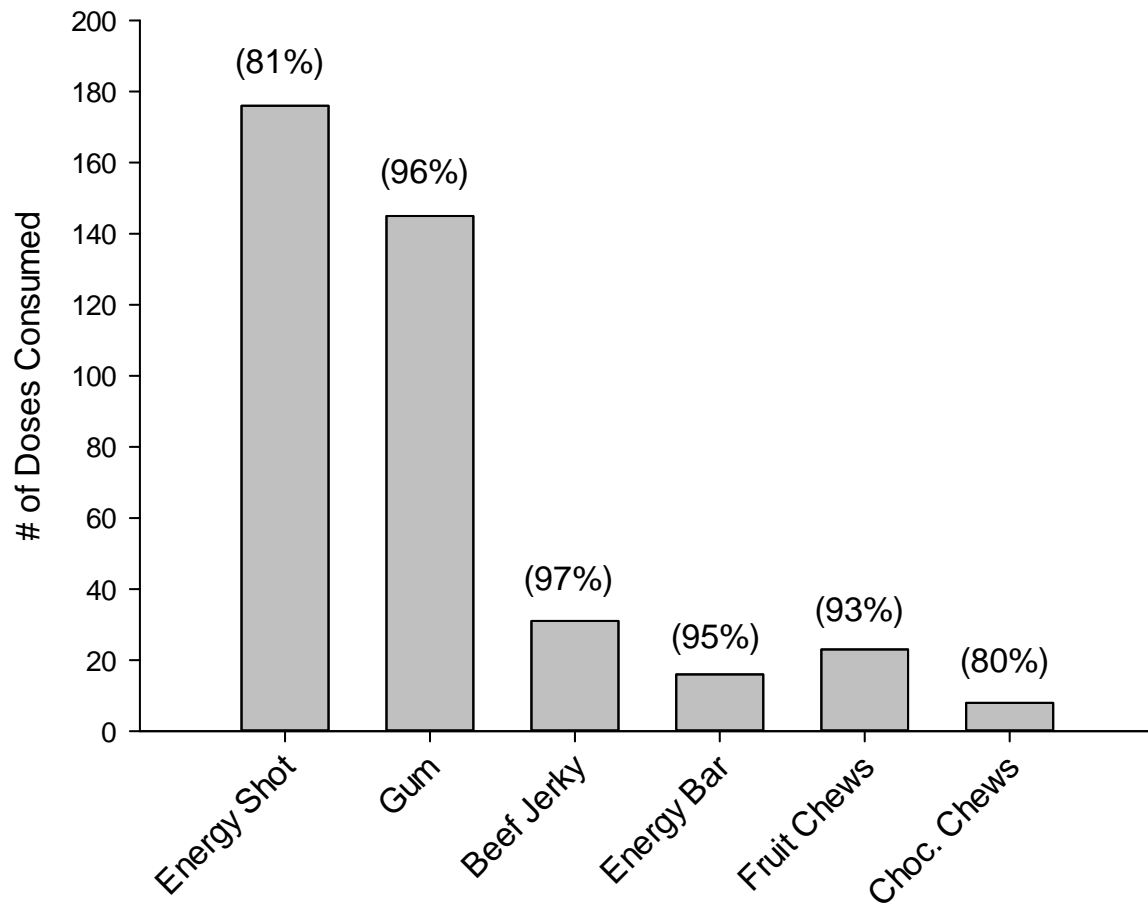


Figure 6. Attributes that made energy shot and caffeinated gum popular products during Phase III self-select tests.

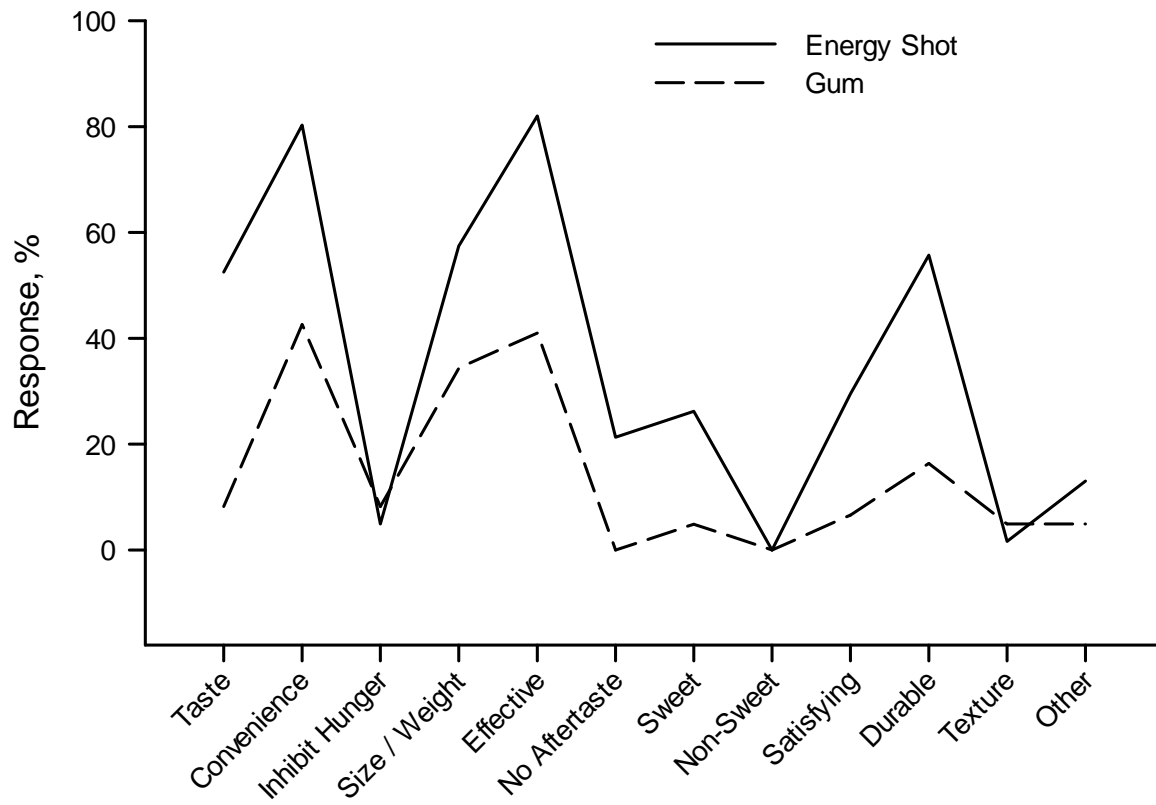
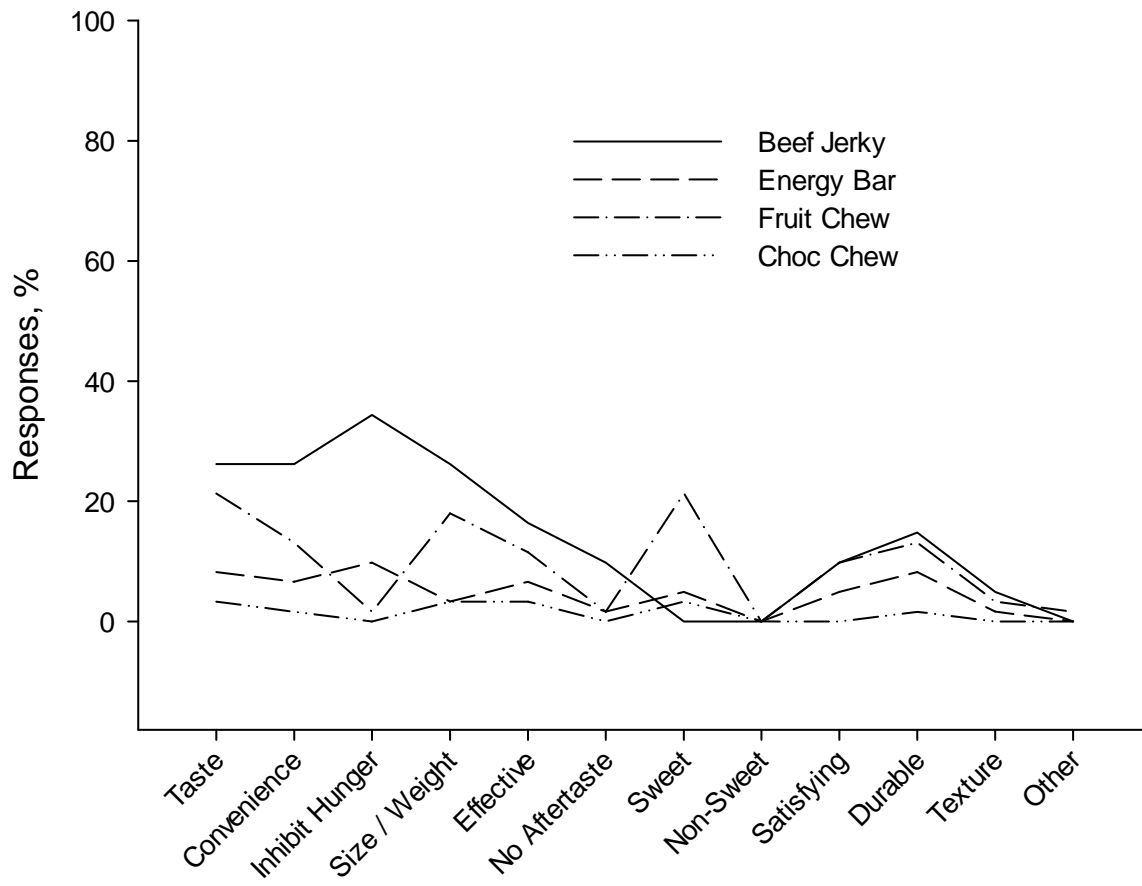


Figure 7. Attributes for beef jerky, energy bar, fruit chews, and chocolate chews that led to their consumption during Phase III self-select tests.



REFERENCES

Amendola CA, Gabrieli JDE, Lieberman HR. Caffeine's effects on performance and mood are independent of age and gender. *Nutritional Neuroscience* 1998 ; 1:269-280

Sports Drinks. (2011, January-February). *Beverage Spectrum*, p. 14-15.

Cole KJ, Costill DL, Starling RD, Goodpaster BH, Trappe SW, Fink WJ. Effect of caffeine ingestion on perception of effort and subsequent work production. *Int. J. Sport Nutr.* 6:14-23, 1996.

Committee on Military Nutrition Research, Institute of Medicine (IOM). *Caffeine for the sustainment of mental task performance: Formulations for military operations*. Washington, D.C.: National Academy Press, 2001.

Graham TE. Caffeine and exercise: metabolism, endurance and performance. *Sports Med* 2001;31:785–807.

Kamimori GH, Karyekar CS, Otterstetter R, Cox DS, Balkin TJ, Belenky GL, Eddington ND. The rate of absorption and relative bioavailability of caffeine administered in chewing gum versus capsules to normal healthy volunteers. *Int J Pharmaceutics*. 234; 159-167, 2002.

Lieberman HR, Tharion WJ, Shukitt-Hale B, Speckman KL, Tulley R. Effects of caffeine, sleep loss, and stress on cognitive performance and mood during U.S. Navy SEAL training. *Psychopharmacology* 2002;164:250-261.

Lieberman HR, Marriott B. Caffeine use among active duty US Army Soldiers. *JADA*, 2011 (*in press*).

McClung HL, SJ Montain, HR Lieberman, MR Ely, JE Smith, S McGraw, B Davis, AJ Young. Diet Composition and eating patterns influence sustained cognitive performance in a military population. Technical Report T11-01; ADA: 545299, Natick, MA: US Army Institute of Environmental Medicine, 2011.

McLellan TM, Bell DG, Kamimori GH. Caffeine improves physical performance during 24 h of active wakefulness. *Aviat Space Environ Med.* 75:666/672, 2004.

McLellan TM, Kamimori GH, Bell DG, Smith IF, Johnson D, Belenky G. Caffeine maintains vigilance and marksmanship in simulated urban operations with sleep deprivation. *Aviat Space Environ Med.* 76:39-45, 2005.

McLellan TM, Kamimori GH, Voss DM, Bell DG, Cole KG, Johnson D. Caffeine maintains vigilance and improves run times during night operations for special forces. *Aviat Space Environ Med.* 76:647-654, 2005.


McLellan TM, Kamimori GH, Voss DM, Tate C, Smith SJR. Caffeine effects on physical and cognitive performance during sustained operations. *Aviat Space Environ Med.* 78:871-877, 2007.





Motl RW, O'Connor PJ, Dishman RK. Effect of caffeine on perceptions of leg muscle pain during moderate intensity cycling exercise. *J Pain* 2003; 4(6):316–21.

Schmidt RM, McIntire LK, Caldwell JA, Hallman C. Prevalence of Energy-Drink and supplement usage in a sample of air force personnel. AFRL-RH-WP-TP-2010-0010.

Caffeine Intake and Preference - Phase 1

MARKING INSTRUCTIONS

- 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	

LOCATION

- Male
Female

- 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

- | | |
|----|------------------|
| E | 0000000000000000 |
| O | 0000000000000000 |
| WO | 0000000000000000 |

- | | | | |
|----------------|-----------------------|----------|--------------|
| Infantry | Transportation | Signal | Artillery |
| Medical | Cavalry | Supply | Food service |
| Administration | Military intelligence | Engineer | Other |

- | | NEVER | NOT SURE | 1 TIME MONTH | 1 TIME WEEK | FEW TIMES WEEK (2-6) | DAILY |
|----------------------|-------|----------|--------------|-------------|----------------------|-------|
| A. green tea extract | 1 | 3 | 4 | 1 | 3 | 3 |
| B. guarana | 3 | 7 | 7 | 1 | 1 | 3 |
| C. kola nut | 1 | 1 | 1 | 3 | 3 | 3 |
| D. yerba mate | 1 | 3 | 3 | 3 | 3 | 3 |

PLEASE DO NOT WRITE IN THIS AREA

[SERIAL]

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	20 fl oz	24+ fl oz	Times	Blank	Month	Year	Do not write in this box
COFFEE/TEA (caffeinated only)										
EXAMPLE: Brewed Coffee, regular										
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)										
AMP Energy Drink (16 fl oz can).....										
BAWLS Guarana (16 fl oz can).....										
Full Throttle (16 fl oz can).....										
Glacéau 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										
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.

<input type="radio"/> None	<input type="radio"/> 100 mg	<input type="radio"/> 400 mg	<input type="radio"/> 700 mg
	<input type="radio"/> 200 mg	<input type="radio"/> 500 mg	<input type="radio"/> 800 mg
	<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="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?

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="text"/> | Caffeinated <u>FOOD</u> based items
(such as Jerky, gels, energy bar, pudding, and sunflower seeds) |
| <input type="text"/> | Caffeinated <u>BEVERAGE</u> items
(Do not include energy shots in this category - they are under Accessories) |
| <input type="text"/> | Caffeinated <u>CANDY</u> items
(candy bar, chewy candies or chocolates, choc. covered coffee beans, jelly beans, or lollipops) |
| <input type="text"/> | 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			
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Q9_oth	Q10_oth	Q11_oth	Q12_oth

PLEASE DO NOT WRITE IN THIS AREA	[SERIAL]
----------------------------------	-----------------

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.

	1 8 fl oz	2 16 fl oz	3 24 fl oz	4 32 fl oz	5 48 fl oz	6 64 fl oz	7 96 fl oz	8 128 fl oz	9 192 fl oz	10 256 fl oz	11 384 fl oz	12 512 fl oz	13 768 fl oz	14 1024 fl oz	15 1536 fl oz	16 2048 fl oz	17 3072 fl oz	18 4096 fl oz	19 6144 fl oz	20 8192 fl oz	21 12288 fl oz	22 16384 fl oz	23 24576 fl oz	24 32768 fl oz	25 49152 fl oz	26 65536 fl oz	27 98304 fl oz	28 131072 fl oz	29 196608 fl oz	30 262144 fl oz	31 393216 fl oz	32 524288 fl oz	33 786432 fl oz	34 1048576 fl oz	35 1572864 fl oz	36 2097152 fl oz	37 3145728 fl oz	38 4194304 fl oz	39 6291456 fl oz	40 8388608 fl oz	41 12582912 fl oz	42 16777216 fl oz	43 25165824 fl oz	44 33554432 fl oz	45 50331648 fl oz	46 67108864 fl oz	47 100663296 fl oz	48 134217728 fl oz	49 201326592 fl oz	50 268435456 fl oz	51 402653184 fl oz	52 536870912 fl oz	53 805306304 fl oz	54 1073741696 fl oz	55 1610612544 fl oz	56 2147483392 fl oz	57 3221225088 fl oz	58 4294966784 fl oz	59 6442450176 fl oz	60 8589933568 fl oz	61 12884800384 fl oz	62 17179667200 fl oz	63 25769500672 fl oz	64 34359334080 fl oz	65 51538001920 fl oz	66 68716669824 fl oz	67 102550003968 fl oz	68 136383338112 fl oz	69 204575007168 fl oz	70 272766676224 fl oz	71 409150014784 fl oz	72 545533353344 fl oz	73 818300030080 fl oz	74 1091066706816 fl oz	75 1636600065280 fl oz	76 2182133433728 fl oz	77 3273200051200 fl oz	78 4364266668672 fl oz	79 6546400002560 fl oz	80 8728533336448 fl oz	81 13092800005120 fl oz	82 17457066673792 fl oz	83 26185600010624 fl oz	84 34914133317552 fl oz	85 52371200026240 fl oz	86 69828266632896 fl oz	87 104742400049920 fl oz	88 139656533310720 fl oz	89 209484800021248 fl oz	90 279313066627840 fl oz	91 418970000041728 fl oz	92 558626666107392 fl oz	93 837940000167936 fl oz	94 1117253333230080 fl oz	95 1675880000348672 fl oz	96 2234506666467264 fl oz	97 3402240000700160 fl oz	98 4570000000932656 fl oz	99 6855040001399040 fl oz	100 9140080001865424 fl oz	101 13710400002908928 fl oz	102 18280800003952432 fl oz	103 27421600005928704 fl oz	104 36562400007905008 fl oz	105 54843200011861760 fl oz	106 73124000015818528 fl oz	107 109686400023724800 fl oz	108 146248800031631360 fl oz	109 219372800047436800 fl oz	110 292496800063242240 fl oz	111 438745600094867200 fl oz	112 585000000126492160 fl oz	113 877504000189734400 fl oz	114 116500800025258112 fl oz	115 174752000037887360 fl oz	116 233002400050516608 fl oz	117 350252800074374400 fl oz	118 467503200098232000 fl oz	119 699753600147347200 fl oz	120 932004000196462400 fl oz	121 1398008000294688000 fl oz	122 1864012000392913600 fl oz	123 2820016000590540800 fl oz	124 3776020000788167040 fl oz	125 5664032001182732800 fl oz	126 7552044001577298560 fl oz	127 11328064002365440000 fl oz	128 15104084003153580800 fl oz	129 22656128004734208000 fl oz	130 30208172006314837760 fl oz	131 45312256009472000000 fl oz	132 60416340012629184000 fl oz	133 90624512001894784000 fl oz	134 120832688002682035200 fl oz	135 181248000040236800000 fl oz	136 241664000053792000000 fl oz	137 362496000080588800000 fl oz	138 483328000107385600000 fl oz	139 724992000161073280000 fl oz	140 966656000214760960000 fl oz	141 1449984000322127360000 fl oz	142 1933312000429483776000 fl oz	143 2900000000644224000000 fl oz	144 3866688000858964096000 fl oz	145 5799936000128838400000 fl oz	146 7733184000168707328000 fl oz	147 11600000002533120000000 fl oz	148 15466880003377536000000 fl oz	149 23200000005066752000000 fl oz	150 30932960006755968000000 fl oz	151 46399360001012377600000 fl oz	152 61865760001368787200000 fl oz	153 92799360002053209600000 fl oz	154 123732960002737632000000 fl oz	155 185600000040966400000000 fl oz	156 247468800054595200000000 fl oz	157 371200000081881600000000 fl oz	158 494931200010878720000000 fl oz	159 737344000016317440000000 fl oz	160 979756800021756160000000 fl oz	161 1469632000326336000000000 fl oz	162 1959504000435116800000000 fl oz	163 2938240000652736000000000 fl oz	164 3916976000870355200000000 fl oz	165 5875200000129996800000000 fl oz	166 7833440000169638400000000 fl oz	167 11750400002544000000000000 fl oz	168 15667200003388800000000000 fl oz	169 23500800005078400000000000 fl oz	170 31334400006768000000000000 fl oz	171 470000000010124800000000000 fl oz	172 626656000013470400000000000 fl oz	173 940000000020204800000000000 fl oz	174 1253344000026949600000000000 fl oz	175 1880000000040416000000000000 fl oz	176 2506688000053872000000000000 fl oz	177 3760000000080704000000000000 fl oz	178 4973440000107536000000000000 fl oz	179 7460000000161248000000000000 fl oz	180 9946560000214960000000000000 fl oz	181 14920000000322432000000000000 fl oz	182 19893440000429376000000000000 fl oz	183 29866880000646720000000000000 fl oz	184 39840320000864000000000000000 fl oz	185 59734400001296000000000000000 fl oz	186 79628800001728000000000000000 fl oz	187 11945600002592000000000000000 fl oz	188 15928960000345600000000000000 fl oz	189 23897600005184000000000000000 fl oz	190 31866240000691200000000000000 fl oz	191 478000000010368000000000000000 fl oz	192 637334400013824000000000000000 fl oz	193 956000000020736000000000000000 fl oz	194 127468800002764800000000000000 fl oz	195 189200000004128000000000000000 fl oz	196 250934400005488000000000000000 fl oz	197 376000000008192000000000000000 fl oz	198 497344000010752000000000000000 fl oz	199 746000000016128000000000000000 fl oz	200 994656000021496000000000000000 fl oz	201 149200000003225600000000000000 fl oz	202 198934400004294400000000000000 fl oz	203 298668800006467200000000000000 fl oz	204 398403200008640000000000000000 fl oz	205 597344000012960000000000000000 fl oz	206 796288000017280000000000000000 fl oz	207 119456000025920000000000000000 fl oz	208 159289600003456000000000000000 fl oz	209 238976000051840000000000000000 fl oz	210 318662400006912000000000000000 fl oz	211 478000000010368000000000000000 fl oz	212 637334400013824000000000000000 fl oz	213 956000000020736000000000000000 fl oz	214 127468800002764800000000000000 fl oz	215 189200000004128000000000000000 fl oz	216 250934400005488000000000000000 fl oz	217 376000000008192000000000000000 fl oz	218 497344000010752000000000000000 fl oz	219 746000000016128000000000000000 fl oz	220 994656000021496000000000000000 fl oz	221 149200000003225600000000000000 fl oz	222 198934400004294400000000000000 fl oz	223 298668800006467200000000000000 fl oz	224 398403200008640000000000000000 fl oz	225 597344000012960000000000000000 fl oz	226 796288000017280000000000000000 fl oz	227 119456000025920000000000000000 fl oz	228 159289600003456000000000000000 fl oz	229 238976000051840000000000000000 fl oz	230 318662400006912000000000000000 fl oz	231 478000000010368000000000000000 fl oz	232 637334400013824000000000000000 fl oz	233 956000000020736000000000000000 fl oz	234 127468800002764800000000000000 fl oz	235 189200000004128000000000000000 fl oz	236 250934400005488000000000000000 fl oz	237 376000000008192000000000000000 fl oz	238 497344000010752000000000000000 fl oz	239 746000000016128000000000000000 fl oz	240 994656000021496000000000000000 fl oz	241 149200000003225600000000000000 fl oz	242 198934400004294400000000000000 fl oz	243 298668800006467200000000000000 fl oz	244 398403200008640000000000000000 fl oz	245 597344000012960000000000000000 fl oz	246 796288000017280000000000000000 fl oz	247 119456000025920000000000000000 fl oz	248 159289600003456000000000000000 fl oz	249 238976000051840000000000000000 fl oz	250 318662400006912000000000000000 fl oz	251 478000000010368000000000000000 fl oz	252 637334400013824000000000000000 fl oz	253 956000000020736000000000000000 fl oz	254 127468800002764800000000000000 fl oz	255 189200000004128000000000000000 fl oz	256 250934400005488000000000000000 fl oz	257 376000000008192000000000000000 fl oz	258 497344000010752000000000000000 fl oz	259 746000000016128000000000000000 fl oz	260 994656000021496000000000000000 fl oz	261 149200000003225600000000000000 fl oz	262 198934400004294400000000000000 fl oz	263 298668800006467200000000000000 fl oz	264 398403200008640000000000000000 fl oz	265 597344000012960000000000000000 fl oz	266 796288000017280000000000000000 fl oz	267 119456000025920000000000000000 fl oz	268 159289600003456000000000000000 fl oz	269 238976000051840000000000000000 fl oz	270 318662400006912000000000000000 fl oz	271 478000000010368000000000000000 fl oz	272 637334400013824000000000000000 fl oz	273 956000000020736000000000000000 fl oz	274 127468800002764800000000000000 fl oz	275 189200000004128000000000000000 fl oz	276 250934400005488000000000000000 fl oz	277 376000000008192000000000000000 fl oz	278 497344000010752000000000000000 fl oz	279 746000000016128000000000000000 fl oz	280 994656000021496000000000000000 fl oz	281 149200000003225600000000000000 fl oz	282 198934400004294400000000000000 fl oz	283 298668800006467200000000000000 fl oz	284 398403200008640000000000000000 fl oz	285 597344000012960000000000000000 fl oz	286 796288000017280000000000000000 fl oz	287 119456000025920000000000000000 fl oz	288 159289600003456000000000000000 fl oz	289 238976000051840000000000000000 fl oz	290 318662400006912000000000000000 fl oz	291 478000000010368000000000000000 fl oz	292 637334400013824000000000000000 fl oz	293 956000000020736000000000000000 fl oz	294 127468800002764800000000000000 fl oz	295 189200000004128000000000000000 fl oz	296 250934400005488000000000000000 fl oz	297 376000000008192000000000000000 fl oz	298 497344000010752000000000000000 fl oz	299 746000000016128000000000000000 fl oz	300 994656000021496000000000000000 fl oz	301 149200000003225600000000000000 fl oz	302 198934400004294400000000000000 fl oz	303 298668800006467200000000000000 fl oz	304 398403200008640000000000000000 fl oz	305 597344000012960000000000000000 fl oz	306 796288000017280000000000000000 fl oz	307 119456000025920000000000000000 fl oz	308 159289600003456000000000000000 fl oz	309 238976000051840000000000000000 fl oz	310 318662400006912000000000000000 fl oz	311 478000000010368000000000000000 fl oz	312 637334400013824000000000000000 fl oz	313 956000000020736000000000000000 fl oz	314 127468800002764800000000000000 fl oz	315 189200000004128000000000000000 fl oz	316 250934400005488000000000000000 fl oz	317 376000000008192000000000000000 fl oz	318 497344000010752000000000000000 fl oz	319 746000000016128000000000000000 fl oz	320 994656000021496000000000000000 fl oz	321 149200000003225600000000000000 fl oz	322 198934400004294400000000000000 fl oz	323 298668800006467200000000000000 fl oz	324 398403200008640000000000000000 fl oz	325 597344000012960000000000000000 fl oz	326 796288000017280000000000000000 fl oz	327 119456000025920000000000000000 fl oz	328 159289600003456000000000000000 fl oz	329 238976000051840000000000000000 fl oz	330 318662400006912000000000000000 fl oz	331 478000000010368000000000000000 fl oz	332 637334400013824000000000000000 fl oz	333 956000000020736000000000000000 fl oz	334 127468800002764800000000000000 fl oz	335 189200000004128000000000000000 fl oz	336 250934400005488000000000000000 fl oz	337 376000000008192000000000000000 fl oz	338 497344000010752000000000000000 fl oz	339 746000000016128000000000000000 fl oz	340 994656000021496000000000000000 fl oz	341 149200000003225600000000000000 fl oz	342 198934400004294400000000000000 fl oz	343 298668800006467200000000000000 fl oz	344 398403200008640000000000000000 fl oz	345 597344000012960000000000000000 fl oz	346 796288000017280000000000000000 fl oz
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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"/> 200 mg | <input type="radio"/> 500 mg | <input type="radio"/> 800 mg |
| | <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="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 _____ |

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	DAY	TASTE	SERVING	EASY TO	PRODUCT
	PRODUCT	TRIED				
A. 5-Hr Energy, shots	X	1	1	1	1	1
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. Sun Seeds, sunflower						
J. ZipFizz, bev powder mix						

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. Sun Seeds, sunflower			
J. ZipFizz, bev powder mix			

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

Additional COMMENTS on the products you tried:

Natick Form 2621 (OT)
21 Apr 2010

comments_overall

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

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

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

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

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

FOR OFFICE USE ONLY

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
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dislike_taste

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
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dislike_packaging

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
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dislike_usability

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
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dislike_overall

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
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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>	<div><div></div><div></div><div></div></div> <div>1 2 3 4 5 6 7 8 9 0</div> <div>1 2 3 4 5 6 7 8 9 0</div> <div>1 2 3 4 5 6 7 8 9 0</div>

	1. Would this item be a valuable addition to your field rations?			2. 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						
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						

	3. Using the scale below, please rate how likely you would be to use the products during <u>field training</u> .		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 .
	1-Extremely Unlikely	9-Extremely Likely	TOP 5 RANKING
A. 5-Hr Energy, shots	1 2 3 4 5 6 7 8 9		1 2 3 4 5
B. Alien Energy, beef jerky	1 2 3 4 5 6 7 8 9		1 2 3 4 5
C. Atomic Energy Bites, candy	1 2 3 4 5 6 7 8 9		1 2 3 4 5
D. Buzz Bites, chewy choc.	1 2 3 4 5 6 7 8 9		1 2 3 4 5
E. FIXX Energy Packet	1 2 3 4 5 6 7 8 9		1 2 3 4 5
F. FSR Bar, energy bar	1 2 3 4 5 6 7 8 9		1 2 3 4 5
G. Rocket Choc, candy bar	1 2 3 4 5 6 7 8 9		1 2 3 4 5
H. Stay Alert, gum	1 2 3 4 5 6 7 8 9		1 2 3 4 5
I. Sum Seeds, sunflower	1 2 3 4 5 6 7 8 9		1 2 3 4 5
J. ZipFizz, bev powder mix	1 2 3 4 5 6 7 8 9		1 2 3 4 5

Garrison Caffeine Sampling - Phase 3 Daily Record

LAST 4 SSN _____

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 3 products to consume during the next 24 hours. As you consume the product, please fill out the information below. The next morning, we will collect this card and all unconsumed items AND the wrappers or bottles of the items you did consume. Please place all items to be returned in the ziplock bag. Based on the products that **YOU RECEIVED TODAY**, please provide us feedback on what you liked or disliked, as a possible ration item.

DAY _____

Please let us know which products you received and how much of the product did you consume. Mark the "0" 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 TODAY. If the overall product is **DISLIKED** (ratings of 1 - 3) please describe WHY on back.

1 = Dislike Extremely TO 7 = Like Extremely

RECEIVED PRODUCT	NUMBER OF PACKAGES TAKEN	PORTIONS 0 0.5 1 1.5 2 2.5 3	AMOUNT CONSUMED	PRODUCT OVERALL
A. 5-Hr Energy, shots	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
B. Lightning Rod, beef jerky	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
C. FSR Bar, energy bar	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
D. Rocket Choc, candy bar	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
E. Buzz Bites, chewy choc.	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
F. Atomic Energy Bites, candy	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
G. Stay Alert, gum	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Did you have any negative side effects to the products you consumed today?

YES* NO NOT SURE

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

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

Additional COMMENTS:

If you unsatisfied with the "Lightening Rod, beef jerky" for any reason, why?

If you unsatisfied with the "FSR Bar, energy bar" for any reason, why?

If you unsatisfied with the "Rocket Choc, candy bar" for any reason, why?

If you unsatisfied with the "Buzz Bites, chewy choc." for any reason, why?

If you unsatisfied with the "Atomic Energy Bites, candy" for any reason, why?

If you unsatisfied with the "Stay Alert, gum" for any reason, why?

If YES to negative side effects, which product(s) and what was the side effect?

FOR OFFICE USE ONLY

5-Hr Energy, shots

Lightening Rod, beef jerky

FSR Bar, energy bar

Rocket Choc, candy bar

Buzz Bites, chewy choc.

Atomic Energy Bites, candy

Stay Alert, gum

side effects

comments



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	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

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 BULKY	NOT DURABLE	HARD TO OPEN	OTHER
A. 5-Hr Energy, shots	1	2	3	4	5	6
B. Lightening Rod, beef jerky	1	2	3	4	5	6
C. FSR Bar, energy bar	1	2	3	4	5	6
D. Rocket Choc, candy bar	1	2	3	4	5	6
E. Buzz Bites, chewy choc.	1	2	3	4	5	6
F. Atomic Energy Bites, candy	1	2	3	4	5	6
G. Stay Alert, gum	1	2	3	4	5	6

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	1	2
B. Lightening Rod, beef jerky	1	2
C. FSR Bar, energy bar	1	2
D. Rocket Choc, candy bar	1	2
E. Buzz Bites, chewy choc.	1	2
F. Atomic Energy Bites, candy	1	2
G. Stay Alert, gum	1	2

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	1	2	3	4	5	6
B. Lightening Rod, beef jerky	1	2	3	4	5	6
C. FSR Bar, energy bar	1	2	3	4	5	6
D. Rocket Choc, candy bar	1	2	3	4	5	6
E. Buzz Bites, chewy choc.	1	2	3	4	5	6
F. Atomic Energy Bites, candy	1	2	3	4	5	6
G. Stay Alert, gum	1	2	3	4	5	6

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?

	1	2	3	4	5	6	7
A. 5-Hr Energy, shots	<input type="radio"/>	<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"/>	<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"/>	<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"/>	<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"/>	<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"/>	<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"/>	<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	NO AFTER TASTE	EFFECTIVE	NON SWEET	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"/>

A.
B.
C.
D.
E.
F.
G.

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 ☐ 51 ☐ 52 ☐ 53 ☐ 54 ☐ 55 ☐ 56 ☐ 57 ☐ 58 ☐ 59 ☐ 60 ☐ 61 ☐ 62 ☐ 63 ☐ 64 ☐ 65 ☐ 66 ☐ 67 ☐ 68 ☐ 69 ☐ 70 ☐ 71 ☐ 72 ☐ 73 ☐ 74 ☐ 75 ☐ 76 ☐ 77 ☐ 78 ☐ 79 ☐ 80 ☐ 81 ☐ 82 ☐ 83 ☐ 84 ☐ 85 ☐ 86 ☐ 87 ☐ 88 ☐ 89 ☐ 90 ☐ 91 ☐ 92 ☐ 93 ☐ 94 ☐ 95 ☐ 96 ☐ 97 ☐ 98 ☐ 99 ☐ 100

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 ☐ 51 ☐ 52 ☐ 53 ☐ 54 ☐ 55 ☐ 56 ☐ 57 ☐ 58 ☐ 59 ☐ 60 ☐ 61 ☐ 62 ☐ 63 ☐ 64 ☐ 65 ☐ 66 ☐ 67 ☐ 68 ☐ 69 ☐ 70 ☐ 71 ☐ 72 ☐ 73 ☐ 74 ☐ 75 ☐ 76 ☐ 77 ☐ 78 ☐ 79 ☐ 80 ☐ 81 ☐ 82 ☐ 83 ☐ 84 ☐ 85 ☐ 86 ☐ 87 ☐ 88 ☐ 89 ☐ 90 ☐ 91 ☐ 92 ☐ 93 ☐ 94 ☐ 95 ☐ 96 ☐ 97 ☐ 98 ☐ 99 ☐ 100
- Caffeinated **FOOD** based items
(such as Jerky, gels, energy bar, pudding, and sunflower seeds)
- Caffeinated **BEVERAGE** items
(Do not include energy shots in this category - they are under Accessories)
- Caffeinated **CANDY** items
(candy bar, chewy candies or chocolates, choc. covered coffee beans, jelly beans, or lollipops)
- 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)