

## CONSUMER ORIENTED PACKAGE DESIGN: IMPROVING MILITARY RATION ACCEPTANCE

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Military rations suffer from a negative stereotype that has evolved over time. Traditionally, efforts have focussed primarily on advancements in food product formulation, processing, and preservation technologies to improve the sensory qualities - and therefore acceptability/consumption of the rations. Rations are frequently not consumed in sufficient quantity to maintain optimal health and performance. This strategy for maximizing ration acceptability/consumption has recently been expanded to include, as an integral part, behavioral research and consumer marketing approaches. These approaches include the determination of social and situational influences, leadership effects, ease of preparation, convenience, and the marketing appeal of rations, etc. Industry has repeatedly shown that creating appealing graphics, beneficial information, and innovative structural elements are major factors that encourage product usage.

These same strategies are being utilized here at NATICK in an exploratory project to develop package design graphics with greater appeal to the user: our military personnel. We are developing new package designs for rations that will emphasize consumer relevant aspects to create a positive product image, which would reduce/eliminate negative perceptions of rations, increase acceptance, promote consumption, increase insurance of nutrient intake, increase individual/mission performance, and enhance morale. I'm going to share some of the highlights from some studies that have been conducted to date and discuss a pilot field study that will be conducted shortly.

A qualitative study was conducted to: design concepts, graphic layouts, and packaging prototypes to promote a positive package appeal; identify critical characteristics of ration packaging and to potentially enhance consumers to try and consume new rations.

Seventy two soldiers/consumers participated in six focus groups consisting of 12 soldiers in each. A focus group consists of a trained moderator who facilitates the group members and stimulates them to interact with each other. Each person's opinions are considered in the group discussion. Each person is exposed to the ideas and opinions of others. The interchange among respondents is what makes a focus group effective in generating ideas. Ideas generated by these groups, which included colors, names, information needs, shapes and sizes for foods, and designs for the packages were used to develop the final graphic layout and several mockup designs for the packages. Three final packaging prototypes

were designed from these data. These included two different "tri-laminate" ziplock pouch designs and a paperboard box/tray design.

To the soldiers the ideal outer container would be flexible enough to fit into their rucksack, be durable, waterproof, resealable, easy to open, vacuum-packed, and compact. The ideal inner container would be easy to open, waterproof, and have clear labelling for the food inside.

In the second phase of research, 183 soldiers at Ft. Ord, Ca. participated in a quantitative study. The objectives of the study were: to identify graphic design concepts for ration packaging to enhance their appeal to soldier/consumers; to create ration packaging prototypes that could be used to measure the impact of package design on perceived product; and to test these packaging prototypes against existing ration packaging to assess the impact on product perception.

Soldiers were randomly shown two of the four packages. They were allowed to look at, but not handle the packages. Each package was labelled "OPRS" ( Optimal Performance Ration System) containing "Menu 3" which was the name created for the purpose of the research. The food inside the package was not exhibited. Each soldier was presented two of the following four package types: Ziplock (1); Ziplock (2); Paperboard box/tray; and Existing field ration package (used for procedural control).

The primary areas of interest for each package were its functionality, appearance, and its effect on consumer attitudes/perceptions of the food it contained. Using a bi-polar scale which uses opposite descriptives, i.e. plain/fancy, soldiers were asked to rate each package on characteristics related to these areas. The specific attributes evaluated in each category pertained to the functionality, appearance and perceptions of the food inside the package.

**RESULTS:** One-way analysis of variance - ANOVA - (a statistical test) conducted on FUNCTIONALITY attributes showed a significant difference for every criterion. Though rated highest in durability, the standard MRE package was generally seen as bulky, not reusable, difficult to open and hard to store. Problems with the box included fragility as well as inability to resist water and spoilage. Both zip-locks were rated as reusable and easiest to open.

With regard to APPEARANCE attributes, ANOVA also showed significant differences on all attributes. The standard MRE package was perceived as plain, unattractive, dull, unimpressive, ordinary and not colorful. The paperboard box and green and white zip-lock bag were perceived as too "fancy" for field use. Overall, the two zip-locks were rated as more attractive, interesting, impressive and unique than the others, as well as having the highest quality.

When soldiers were asked to rate perceived attributes of the food products inside the packages (without seeing or tasting them), several significant differences were noted. The food in both the zip-lock pouches and the paperboard box was perceived as better tasting, having higher quality ingredients, being more appetizing and being more likely to be made by a reputable company than the food in the standard MRE package. Soldiers also agreed that the zip-locks and box were more likely to contain "foods I like" than the standard MRE. Finally, the food contained in the zip-lock pouches was perceived as significantly fresher tasting, easier to clean-up and more natural looking than food contained in either the box or the standard MRE.

This is not the first time that positive results have occurred when soldiers evaluated more commercial-like packages. Other studies have been conducted in Behavioral Sciences where soldiers have tasted the same food in military packages, plain bowls, and commercial packages. Each time the food was rated higher and more was consumed when served in the commercial packages.

In a related area: a labelling study was conducted recently with soldiers in the field to evaluate four different graphic labels for a milkshake package. Each label conveyed a different message.

Label A conveyed a soldier image having a quick easy great-tasting balanced milkshake.

Label B resembled a commercial-like appealing milkshake complete with glass and straw and emphasized taste.

Label C was a typical, generic military label.

Label D provided easy pictorial instructions for making the milkshake and provided some nutritional information.

**RESULTS:** Soldiers rated Label D the highest with a mean of 4.3. This label was perceived as interesting, easily understandable with clear and concise directions, well drawn, meaningful, and makes the food seem better, even if its the same thing. Label B was second with a mean of 3.9 and was perceived as commercial-like, appetizing, and appealing. Label A rated a mean of 3.3 was seen as Army related, not different, not as appealing. Label C which is the standard military labelling format rated last with a mean of 3.2. The results clearly showed that commercial-like labelling with clear, appealing, interesting graphics is definitely perceived as more appetizing.

A pilot field consumption study will be conducted shortly to evaluate the consumption and acceptability of an identical MRE meal packaged in three different outer packages. The objective of the study is to quantify the effect that the more commer-

cial-like packaging has on consumption and acceptability of an identical ration. Each package will have different types of inner package components with different labelling. After the taste test, the packages will be evaluated on functionality, appearance, naming, graphics, and labelling.

Strategies for nutritional information labelling formats are underway. A study to assess soldiers' nutritional knowledge will be conducted, along with focus groups to assess various nutritional graphic formats. Based on input from the research, a quantitative nutritional labelling study will be conducted.

While much of what we have begun here is commonplace in industry, this approach of using packaging design and graphics as a marketing tool is the first attempt in the military to do this.

Based on the results of the research, potential package designs with more positive soldier appeal may replace the present designs. This research will not only have positive implications for Natick by increasing the appeal of the rations we develop, but also improve the morale of our fighting troops.

**MS. JOAN KALICK, Project Officer, Natick:** Ms. Kalick has worked at Natick for the past 13 years. She has worked in the Sensory Analysis Section as a Home Economist overseeing the Food Acceptance Panels which evaluate military rations for dining hall and field use. In the past five years she has been a project officer on consumer testing of tray packs; worked on a few dental liquid studies; and most recently has been project officer on acceptance engineering of tailorable rations. She completed Focus Group Moderator Training School and in the past five years has conducted more than 50 focus groups to get feedback with military consumers. She graduated from Framingham State College cum laude with a B.S., Home Economics and has taken some marketing courses at Harvard Extension. She is author and co-author of seven technical reports and recently wrote an article on A Qualitative Approach to Marketing which was published in the Licensing Product Times.