

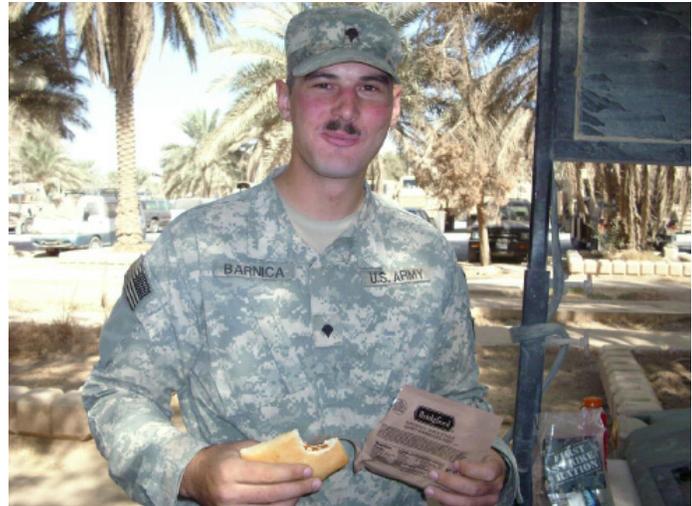


## SHELF STABLE POCKET SANDWICHES

Shelf stable pocket sandwiches enhance the variety of individual ration components while providing a much needed eat-on-the-move capability. Presently there are eight shelf stable sandwiches that are considered to be the main component of First Strike Rations: nacho flavored beef, pepperoni, honey barbecue chicken, honey barbecue beef, Italian style, bacon cheddar, barbecue pork, and Mexican style, all of which were given high marks by the Warfighter during field tests. Additional breakfast sandwich varieties are also under development, they include a maple sausage wrap and an enrobed sausage with cheese. Newly developed sandwiches include chicken salad, tuna salad, or ham salad wrap in a tortilla. The technology used to develop the shelf stable sandwiches is being exploited to provide the Warfighter with the next generation of baked items. These items include pita bread, foccacia, and piza.

### WHY IS IT NEEDED?

Current military doctrine requires troops to be highly mobile, agile and sustainable under any environmental condition, climate and location. Often times the Warfighter does not have the time to stop and prepare a meal. An eat-out-of-hand, eat-on-the-move capability is required for these situations. The pocket sandwich is a major component of the First Strike Ration, a new assault ration for the highly mobile Warfighter.



### TECHNOLOGY:

Hurdle technology is used to provide sandwiches with a minimum 2-year shelf life when held at or below 80°F (6 months at 100°F). This technology uses a number of hurdles (preservation techniques) to inhibit the growth of microorganisms. The use of a combination of several milder barriers rather than a single more severe preservation method (e.g. thermal processing) produces a safe, stable food with increased quality. This multi-targeted approach is equally effective as a preservation method for preventing microbial growth. Also under consideration is the use of osmotic drying technology; an advanced drying technique to remove moisture from ground meat to produce jerky-type snacks.

Current hurdles include water activity, pH, headspace oxygen, modified atmosphere, preservatives and barrier packaging. Water activity can be lowered and controlled by the incorporation of various humectants such as salt, sugars, and glycerol and by controlling baking time and temperature. The pH is controlled by choosing foods that are naturally acidic or by incorporating food grade acids. Naturally acidic ingredients include tomato, vinegar, and fermented meats (pepperoni). However, these ingredients must be limited to prevent a product from being too acidic.

Oxygen is essential for the growth of many bacteria, yeast mold and chemical reactions. The sandwiches are packaged in tri-laminated pouches, which prevent the transmission of both oxygen and moisture. Oxygen sachets are also incorporated into the package to absorb residual oxygen. The use of natural antimicrobials are being investigated to improve quality and increase variety of intermediate moisture products by expanding hurdle thresholds for pH and water activity. Microbial challenge and storage studies have concluded that utilizing careful Formulation and hurdle technology results in a multi-component sandwich product that is successful in preventing microbial growth and meets our stringent shelf life requirements while maintaining good quality flavor and texture throughout the lifecycle.

### BENEFITS:

**Enhanced Mobility**...can be eaten directly from the package and requires no refrigeration or heating.

**Flexible**...sandwiches can be eaten hot or cold, individually or as part of a complete meal.

Point of Contact:

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