



## ADVANCED THERMAL PROCESSING

Advanced Thermal Processing applies Microwave-Assisted Thermal Sterilization (MATS) or Ohmic Heating (OH) for direct heating methods that offer faster, deeper thermal penetration of a variety of foods with better heating uniformity than conventional retorting or canning, which relies on heat transfer from external media.

### WHY IS IT NEEDED?

The promising new direct heating technology from microwave energy sources will allow the development of currently unavailable combat ration components, such as heat sensitive egg and dairy products, fresh-like vegetables and tender whole muscle meats. This will lead to increased quality and variety of combat ration menus and enhanced morale and nutritional status of the Warfighter.

### TECHNOLOGY:

MATS technology was based on microwave heating concept that sharply shortens the process time (~3 min microwave heating time plus 5-6 min holding) compared to conventional retort of packaged foods (~30-120 min), thus offering possibilities to reduce thermal degradation in food quality. MATS processed entree products, such as chicken breast, have received significantly higher quality ratings than the retorted counterparts; even after prolonged storage at an elevated temperature.

MATS has been pursued through cooperative research with Washington State University and many industrial partners. The original MATS consortium effort under the DoD Dual Use S&T Program has obtained acceptance of filings to commercially sterilize a mashed potato in 10-oz trays from the Food and Drug Administration (FDA) in 2009, a salmon fillet in Alfredo sauce in pouch in 2010, and a chicken dumpling in 2011. A MATS consortium II was formed, which included many original consortium members and new members including major ration producers, to commercialize the MATS systems.

Several MATS-150 systems (capable of processing 150 trays/min) are being constructed.

### KEY FEATURES:

- Optimized nutrient retention, flavor, texture and shelf-life of combat ration components using new and efficient direct-heat sterilization processes.
- Offers a wider variety of high quality, typically heat-sensitive components for individual and group ration platforms.

### POINT OF CONTACT:

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ABOVE: Microwave-Assisted Thermal Sterilization (MATS);  
BELOW: Continuous Microwave Sterilizer



Retorted Chicken Pasta

MW Chicken Pasta

**UNCLASSIFIED**

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**TECHNOLOGY DRIVEN. WARFIGHTER FOCUSED.**