



Nutrition Retention and MATS

The use of heat is considered the gold standard for safely preserving food for the shelf.

However, the application of heat to food, whether for cooking or in the sterilization process, may cause a reduction in certain nutrient levels. Food scientists have long studied the effects of heat on the quality and nutrient profile of food and determined that the degree of nutrient loss is dependent on the severity of the thermal process. Heat-sensitive nutrients such as B vitamins, vitamin C and folate are especially susceptible to degradation during thermal processing.

Kinetic testing is a tool used to measure the time-temperature effect on nutrients. Results of the studies below demonstrate that lengthy exposure to high heat causes a significant reduction in heat-sensitive nutrients. Alternative processing technologies, such as Microwave assisted thermal sterilization (MATS™), maximize nutrient retention and food quality through the use of high heat and shorter processing times.

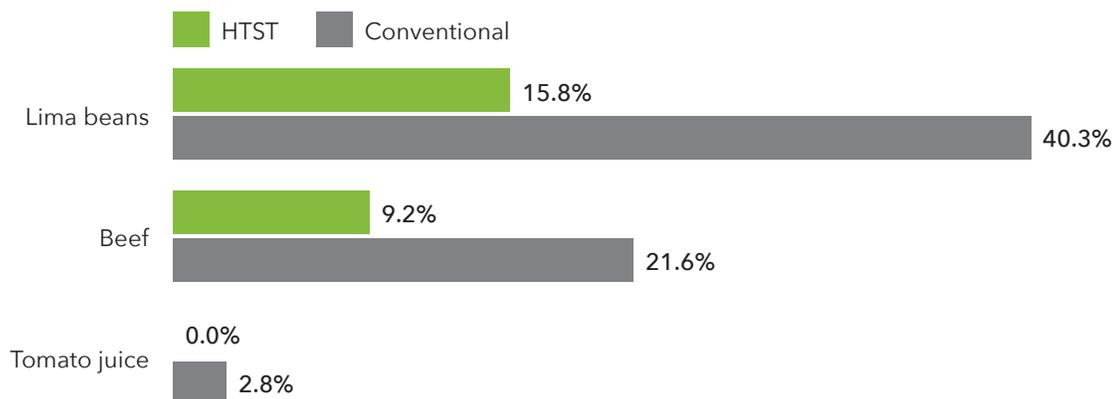
MATS

MATS™ was developed as a healthier alternative to conventional thermal processing, or retort. In retort, packaged foods are exposed to 121°C for up to 70 minutes. With MATS, packaged foods are simultaneously heated externally in a water bath and internally with microwave energy, followed by rapid cooling. This high-temperature/short-time (HTST) process eliminates microorganisms and pathogens in a matter of minutes, and allows nutrients, color, flavors and texture to remain intact. MATS can also perform HTST pasteurization that extends shelf-life of refrigerated foods and beverages to up to 14 weeks.

STUDY RESULTS

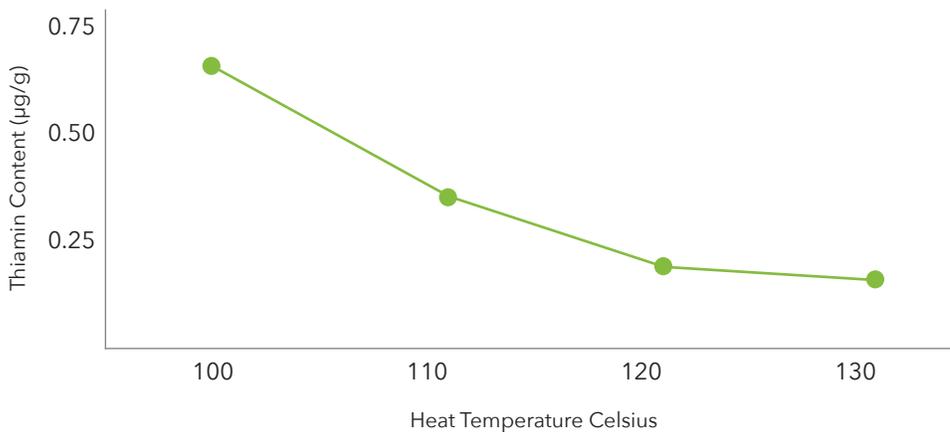
THIAMIN Thiamin is significantly greater in products processed using HTST than in those undergoing conventional thermal processing (retort).¹

PERCENTAGE OF THIAMIN LOSS



The loss in the thiamin content of raw salmon (2.03 lg/g) increases with processing temperature, with the greatest amount of cook loss occurring within the first 30 minutes.²

THIAMIN CONTENT BY HEAT TEMPERATURE



Omega 3s MATS-processed salmon retains up to 5.3 mg of heart-healthy Omega 3s, compared to retort-processed salmon, which typically retains just .3 mg.⁴

HEALTHY OMEGA 3s



Vitamins Vitamin B6 and pantothenic acid losses can be as high as 91 percent in canned foods.¹

Antioxidants Asparagus sterilized with MATS showed greater antioxidant activity and greener color than did asparagus processed by the conventional methods.³

Salt MATS food recipes start with 30-50 percent less sodium than retort recipes.⁴

Spices Spices do not thermally degrade during the MATS process, which allows ethnic cuisines and other flavorful meals to pasteurize and sterilize while retaining freshly prepared flavors.

Sources:

¹ Nutritional Evaluation of Food Processing
Karmas E., Harris, R.S.
Effects of Heat Processing on Nutrients
Daryl Lund
Springer Dordrecht 1988

² Kinetics of salmon quality changes during thermal processing
Fanbin Kong, Juming Tang, Barbara Rasco, Chuck Crapo
Journal of Food Engineering 83 (2007) 510-520
www.elsevier.com/locate/jfoodeng

³ Antioxidant activity and quality of asparagus affected by microwave-circulated water combination and conventional sterilization
Ting Sun, Juming Tang, Joseph R. Powers
Food Chemistry 100 (2007) 813-819
www.elsevier.com/locate/foodchem

⁴ Food Engineering, Washington State University

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