

## HPP Technology: Food Safety, Extended Shelf Life and All Natural



Deli counter displaying a variety of wet salads



Artichoke parmesan dip



Guacamole

The wet salad and dip segment of the food industry is experiencing phenomenal growth. As new formulations have evolved from the classic potato and macaroni fares to meet changing customer demands, many manufacturers have relied on high acidity and chemical preservatives to meet food safety requirements and a reasonable shelf life.

High pressure processing (HPP) technology, well established in many segments of the food industry, enables food manufacturers to provide safer all natural products with extended quality and shelf-life – without heat or preservatives.

Formerly retorted commodity products, such as canned soups, salsas and sauces can, with very little change be turned into refrigerated products with the use of HPP. These new products carry higher quality and perceived value, with the potential for premium pricing while extending an existing brand.

Some segments of the industry are also able to optimize organoleptical properties of their products because of the positive effects on food components such as hydrocolloids and proteins. The results are improved viscosity, better mouth-feel and the reduction of syneresis.

### Shelf Life and Quality Extension

HPP reduces the levels of spoilage microorganisms and inactivates food borne pathogens in wet salads, dips, soups, and sauces. Currently this category of products is sold in the refrigerated case or deli counter with shelf life varying from 2 to 14 days depending on the acidity level and the addition of preservatives. With HPP, these products will last longer (two times or more) and maintain quality, without the use of preservatives or higher acidity.

### 1. Wet Salads

Non-HPP macaroni salad with vegetables (pH 4.83) had a shelf life of 3 days. High pressure processed (HPP) samples of this product were microbiologically stable for more than 40 days following treatment (Figure 1) with good sensory properties throughout the shelf life. Conversely, the level of spoilage microorganisms in the non-HPP samples increased sharply with notable deterioration of quality. Similar results were obtained for other types of potato and chicken salads.

### 2. Dips, Soups and Sauces

When tested, Non-HPP spinach dip, pH 4.93, achieved a shelf life of 7 days, with Artichoke Parmesan, pH 4.72 reaching a 14-day shelf life. The non-HPP samples spoiled early into the shelf life with high microbial levels and deterioration in organoleptic markers. The shelf life of both products increased to more than 50 days following HPP (Figure 2) with good sensory properties throughout the evaluation.

### 3. Guacamole, Salsas and Other Condiments

Avocado based products, particularly guacamole, pioneered the adoption of HPP technology. First introduced to a relatively small retail market in southern Texas in 1997, it is by far the largest volume product that uses HPP to ensure food safety and extend shelf life without the use of preservatives (Figure 3). Other very successful products in this category include hummus, salsas, soups and a number of fresh made condiments. These products are distinguished for their superior fresh taste, high nutrients, no preservatives, and long shelf life. Companies are now able to command larger geographic distribution areas for fresh home made style products that have traditionally used heat and chemicals for safety and shelf life stability.

### Opportunity

High pressure processing offers significant processing advantages for high value ready-to-use wet salads and dips, avocado based products, condiments and sauces. No longer considered a novel technology, HPP is a mainstream effective process that provides manufacturers the tools to offer safe, all natural, wholesome products – without the detrimental effects of heat and chemicals to their customers. This success is also seen among many segments of the food industry, particularly in ready-to-eat (RTE) meat and seafood industries. The technology also enhances the rheological properties of finished products due to the unique behavior of selected food components under pressure.

Figure 1. Shelf-life extension of **Macaroni salad with vegetables** by HPP (pH 4.83)

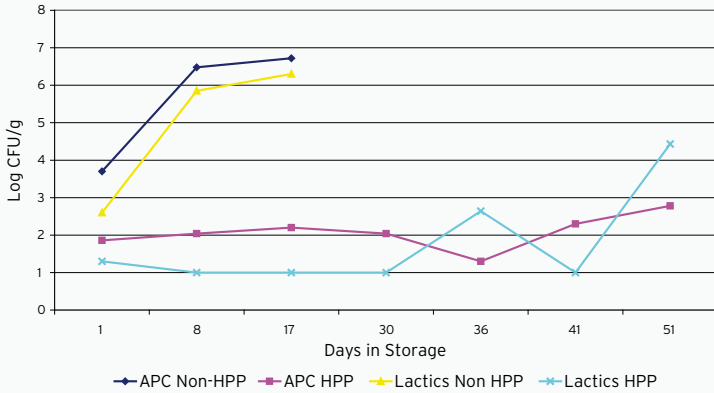


Figure 2. Shelf-life extension of **Artichoke parmesan dip** by HPP (pH 4.72)

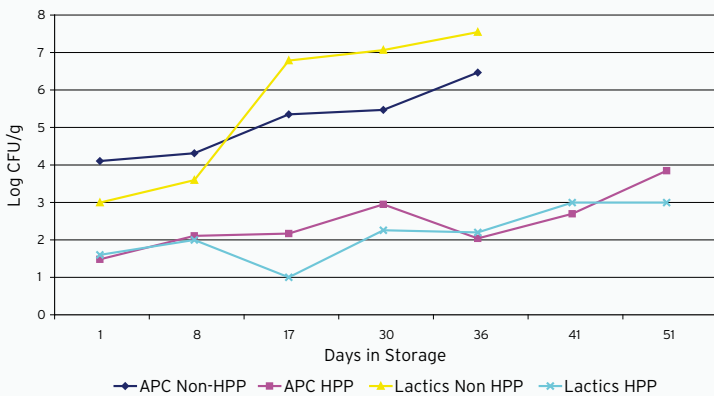
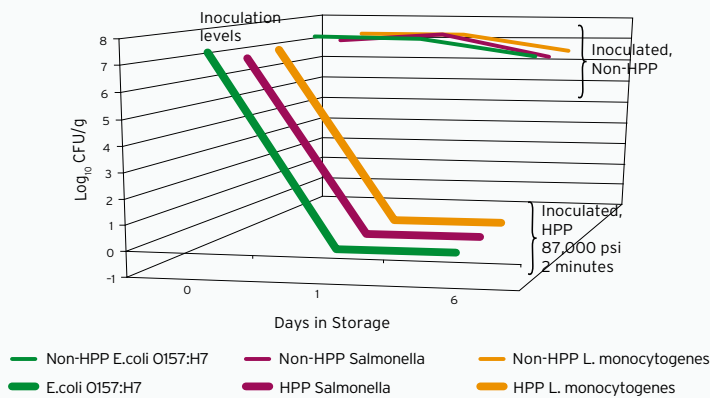


Figure 3. Effects of HPP on bacterial pathogens in **Guacamole** (pH 5.3)



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