

High Pressure Processing of Wet Salads and Dips

Application Brief

Increase of Shelf-life and Quality of Wet Salads and Dips by HPP

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Introduction

The wet salad and dip segment of the food industry is experiencing phenomenal growth. A plethora of new formulations have evolved from the classic potato and macaroni fares to meet the changing customer demands. Many manufacturers have traditionally relied on high acidity and chemical preservatives to achieve a reasonable shelf-life, but today's consumers are requiring more natural, chemical free products. High pressure processing (HPP) technology is well established in many segments of the food industry that have faced similar consumer concerns. HPP gives food manufacturers the tools to provide safer more natural products with extended quality and shelf-life. 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, mouth-feel and the reduction of syneresis.

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

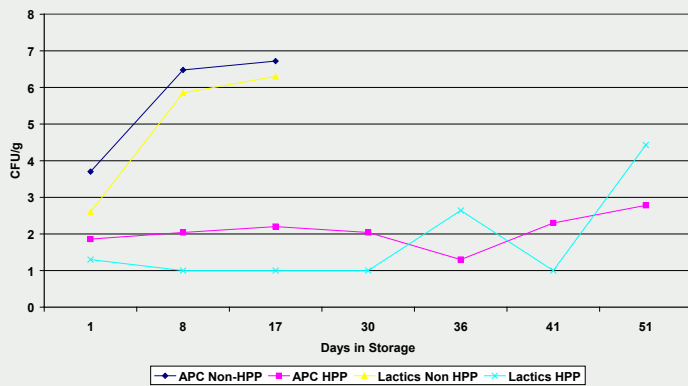
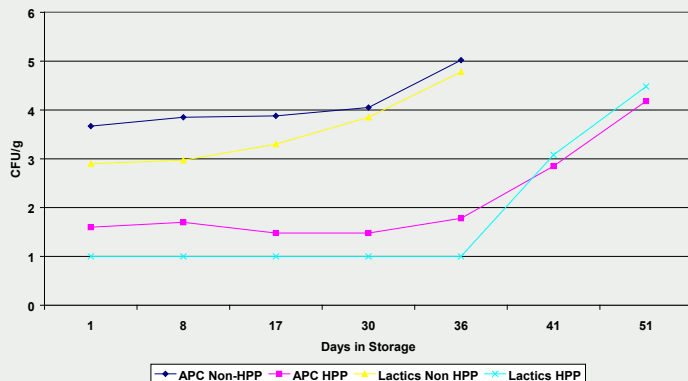


Figure 2. Shelf-life extension of **Old Fashioned Potato Salad** by HPP (pH 4.97)



Shelf-life and Quality Extension

The following studies demonstrate the efficacy of HPP in reducing the levels of spoilage microorganisms in wet salads and dips. These products are sold at the deli counter with a shelf-life varying from 2 days for Old Fashioned Potato salad to 14 days for Artichoke Parmesan dip. Ironically, the only product containing chemical preservatives (Sodium benzoate and Potassium sorbate) is the potato salad with the 2-day shelf-life. All other samples tested relied on various forms of natural ingredients and acidulants for microbial control.

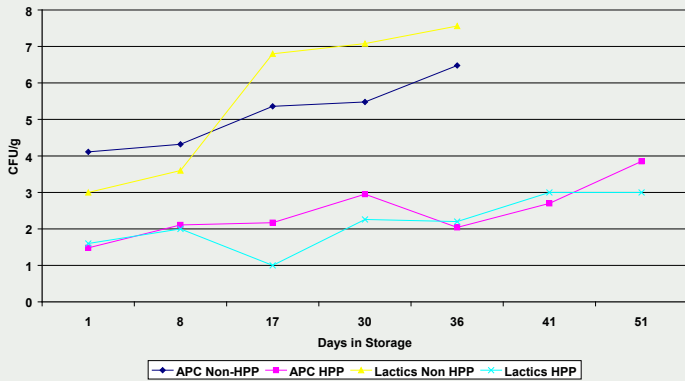
1. Wet Salads

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 Old Fashioned Potato salad with chemical preservatives, pH 4.97, Cashew Chicken salad, pH 5.4, and home made Chicken Potato Salad with eggs, pH 5.4.

Figure 3. Shelf-life extension of Artichoke Parmesan Dip by HPP (pH 4.72)



HPP samples spoiled early into the shelf-life with high microbial levels and deterioration in organoleptic markers.

Conclusion

High pressure offers a significant processing advantage for high value ready-to-use wet salads and dips. It is no longer considered a novel technology. It is a mainstream process that provides manufacturers the tools to offer their customers natural, wholesome products without the detrimental effects of heat and chemicals. This success is seen among many segments of the food industry, particularly in ready-to-eat (RTE) meat and seafood industries. Similar success is seen by manufacturers of avocado based products, such as guacamole, and fruit based products such as smoothies and toppings. With the increase in demand for ready-to-use wet salads and high end dips, many manufacturers are exploring non-traditional methods to take advantage of this market opportunity. There has been a significant increase in the number of inquiries of HPP applicability for wet salads and dips as well as the number of evaluations being conducted at Avure Technologies for these products. HPP technology has been demonstrated as an effective process that increases the safety and shelf-life of natural, preservative-free wet salads and dips. The technology also enhances the rheological properties of finished products due to the unique behavior of selected food components under pressure. It is one of the few food processing technologies that destroy microorganisms without detrimental effects on the wholesomeness of the food.

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2. Dips

Two dips were evaluated, Spinach, pH 4.93 with a shelf-life of 7 days, and Artichoke Parmesan, pH 4.72 (Figure 3) with a 14-day shelf-life. The shelf-life of both products increased to more than 50 days following HPP with good sensory properties throughout the evaluation. The non-



Deli Counter displaying a variety of wet salads.



Artichoke Parmesan Dip

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