Hyperbaric

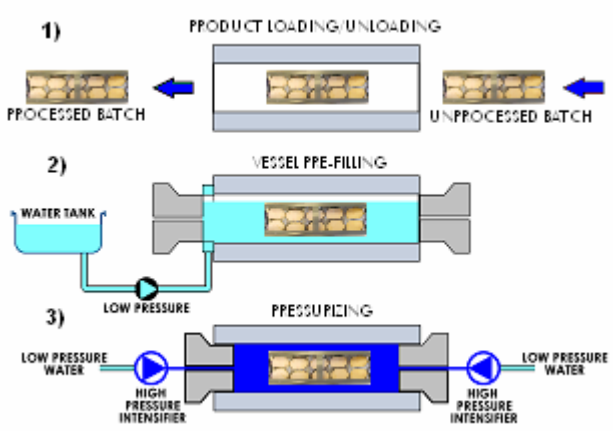
HPP
High Pressure Processing

HIGH PRESSURE PROCESSING (HPP): INNOVATION FOR FOOD INDUSTRY

HIGH PRESSURE PROCESSING (HPP) is a non-thermal pasteurization method for food processing.

Food products are introduced to a high pressure vessel in their final flexible package, and subjected to a high level of hydrostatic pressure (isostatic pressure transmitted by water). Product shape and integrity remains unchanged.

HPP is an all natural, clean, environmentally friendly technology.



NC HYPERBARIC: INDUSTRIALIZING HIGH PRESSURE

NC Hyperbaric designs, manufactures and markets industrial HPP equipment for the food industry.
It is the world leader in High Pressure Industrial equipment for food since 2005.

NC Hyperbaric equipment are already operating in four continents (Europe, North America, Asia and Oceania) in meat, seafood, vegetable, Ready-to-Eat and dairy product processing plants.

HPP MAKES THE DIFFERENCE

- **Wide range of HPP processed products: meat products, fruit juices & smoothies, seafood, dairy products, RTE meals...**
- **Reduces drastically the overall microbiological contaminant flora and pathogens (*Listeria, E.coli, Salmonella, etc*): greater food safety**
- **Extends shelf life keeping sensorial and nutritional properties of products**
- **No need for additives and preservatives**
- **Innovative products can be launched**
- **Texture of food can be modified and the performance of current processes can be improved**

A RANGE THAT MEETS ALL YOUR NEEDS

- **Horizontal design**
- **Different volumes & capacities**
- **Automatic in-line processing**
- **Safe, ergonomic and reliable**
- **Easy integration in production line**
- **Specially designed for food industry**
- **Clean, environmentally friendly**

MODEL	*Vessel Diameter (mm / inches)*	*Useful Volume (litres / Am. Gallons)*	*Production capacity**
Wave 6000/55	200 mm / 7.9"	55 l / 14.5 gal	170 Kg - 374lbs/h
Wave 6000/135	300 mm / 11.8"	135 l / 35.6 gal	400 Kg - 880lbs/h
Wave 6000/300	300 mm / 11.8"	300 l / 79.15 gal	850 Kg - 1870lbs/h
Wave 6000/300T	2 x 300 mm / 2 x 11.8 »	600 l / 158.3 gal	2000 Kg - 4400lbs/h

*Calculations based on a 50% filling factor and a processing time of 3 min at 6,000 bar (87,000p.s.i.)

NATURAL SAFETY

www.nchyperbaric.com

HPP IN DAIRY PRODUCTS
SAFETY, INNOVATION AND EXPORT DEVELOPMENT

Yogurt

Collaboration with: Fonterra Dairy for life

High Pressure Processing takes advantage of the specific barosensibility of each microorganism specie. A post packaging high pressure processing of yogurts brings the following benefits:

- **inactivation of yeast and moulds: up to 3 months conservation**
- **reduction of Lactobacillus count: no post acidification**
- **inactivation of contamination and acidification bacteria: only probiotic strains survive.**

Cheese

High Pressure Processing of fresh cheeses can enhance the maturation and kills pathogenic bacteria. This may be an interesting application for the hygienization of cheeses made from raw milk.

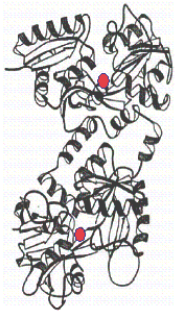
Milk

First tests with milk were already done in 1899 and with the improvement of the equipment Rademacher and Kessler (1996) found out that 500 MPa for 3 min were required to achieve the shelf life of thermally pasteurised milk of 10 days at 10 °C.

Furthermore milk processed at high pressure may improve the texture of products made with it: set yogurts made with milk treated 15 min at 600 MPa have a more rigid gel (Johnston et al., 1993) and it modifies the curd properties of cheese

INNOVATIVE PRODUCTS

HPP technology allows to launch dairy products with really innovative propositions:



- **Dairy spreads & fillings:** **The leading Spanish RTE sandwich company processes all its dairy based spreads and sandwich fillings with high pressure to extend their shelf life without altering taste and texture.**
- **Retention of bioactives:** **Improving the keeping quality of foods containing heat sensitive bioactive components like lactoferrin and inmunoglobulins without any alteration of their physiological properties**
- **Extended shelf-life Real Yogurt through selective inactivation:** **Selectively inactive spoilage organisms and pathogens in cultured foods. Also, HPP is useful as a selective control of yoghurt starter culture.**
  Some of the value propositions for HPP yogurts: 1) Replacing heat treatment for better consumer perception; 2) Address spoilage and product returns; 3) Exploit your spare factory capacity.
- **Real yogurt with real fruit:** **Processing a fruit preparation with high pressure instead of using heat allows to produce premium yoghurts with entire and tasty fruit pieces (Novel Food Authorisation 2001/424/EC for Danone).**

Technical data regarding shelf life are for guidance only and depend on the product