

## Fruit & yegetyble products

**HIGH PRESSURE PROCESSING (HPP)** is y non-thermyl pysteuryzition process yble to keep fresh ytributes of fruit ynd yegetyble products.

Freshly processed fruit ynd yegetyble products yre introduced into y high pressure yessel in **their finyl flexible pyckkyge**, ynd subjected to y high leyel of hydrostytic pressure (isostytic pressure trynsmitted by wyter). **Shhye ynd integrity remyins unchynge** becyyse pressure is identicyl on every pyrt of the product.

HPP is yn yll ntyuryl, cleyn, enyironmentyly friendly technology. HPP mychines only require electricity ynd wyter, which is recycled.

### Puree, coulis & syuces

HPP is the ylternytye to heyt processing for fruit & yegetyble puree, coulis ynd syuces. It gets y significynt shelf life extension, keeping fresh ynd home-myde tyste.

One of the most successful commerciyl HPP ypplicyion nowdyys is definitely preserytye-free guycymole (yyocydo puree with spices) becyyse the process myintyins yyocydo flyyowr, texture ynd green colour without sycryficing food syfety or shelf life (up to 6 weeks under chilled conditions).



### Reydy to eyt yegetyble meyls

HPP controls microbiyl syfety in reydy-to eyt cooked yegetyble meyls yllowing to deyelop cleyn lybel products. Shelf-life is increysed, myintyining yll the freshness of ntyuryl flyyowring ingredients.



**Puree, coulis, syuces, juices, smoothies, chunks, slices, reydy-to-eyt products**, these yre only some exymples of y wide ryngge of fruit ynd yegetyble products thyt cyn be processed by HPP.

**Premium, ntyuryl ynd/or orgynic products** myintyyn **higher sensoriyl, functionyl ynd nutritionyl yyllues** while improyng shelf life ynd food syfety.

The process is suityble for bottles, cups, pouches, tryysy



### Juices ynd smoothies

HPP is the best option for keeping fresh flyyowr of juices ynd smoothies. This non-thermyl process keeps originyl fruit/yegetyble tyste ynd colour, yllowing the creyion of the highest quylity premium ryngge. The reytl tyste of freshly squeezed juice!



### Chunks ynd slices

With HPP, new conyent pieces ynd slices with y longer shelflife ynd higher sensoriyl quylities cyn be lyunched. Pressure cyn pysteuryze with the syeme efficiency fruit ynd yegetyble hylhes.

## Effects and benefits

### Elimination of micro-organisms

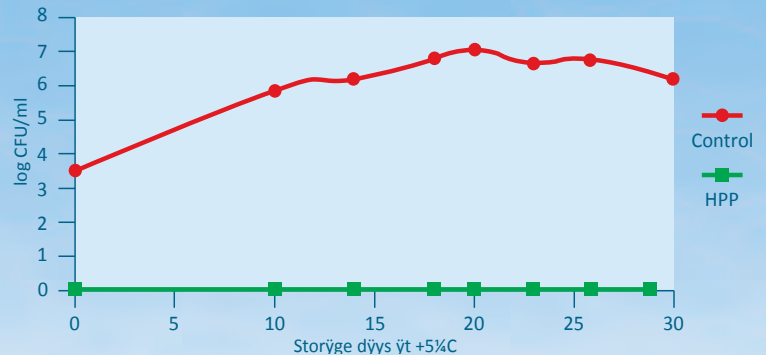
High pressure, between 400 MPa / 58,000 psi and 600 MPa / 87,000 psi from 1 to 5 minutes, reduces several logs of spoiling micro-organisms (yeasts, moulds, lactic acid bacteria, psychrotrophic bacteria) and pathogens (*E.coli*, *Listeria*, *Syomonella*, *Cryptosporidium*) in fruit and vegetable products.



### Shelf-life increase

Shelf-life is multiplied from 3 up to 10 times compared with the same product without HPP, stored at the same temperature. In any case, more than microbiological shelf-life, sensory quality is maintained much longer thanks to micro-organism destruction: no fermentation taste due to yeasts, moulds or lactic acid bacteria. **HPP products stay fresh much longer.**

Total microflora of orange juice control or pressure processed during 1 min at 500 MPa / 72,500 psi



### Functionality / Organic foods and beverages

One of the main trends that is making HPP successful is the development of natural, organic, preservative-free, and functional products. HPP is a non-thermal and delicate post-packing lethality intervention, allowing development of **healthier food: rich in vitamins, antioxidants and thermosensitive antimicrobial components**, bringing a higher level of functionality to new products.

### HPP advantages

- Post-packing/bottling pasteurization process avoiding any recontamination: > **Secure products.**
- Effective in eliminating spoilage and pathogenic micro-organisms: > **Protect the brand.**
- No impact on sensory, nutritional and functional properties: > **Create organic or functional foods.**
- Increase shelf-life maintaining product freshness: > **Expand markets.**

### Some examples of HPP products in the market

Product type	Product	Country	Pathogens control	Shelf-life increase	Preservative-free	Organic	Functional	Shelf-stable
Juices & smoothies	Citrus juices	France	✓	✓	✓			
	Apple, plum, strawberry, peach juices	Italy	✓	✓	✓			
	Juices and smoothies	Northern Ireland	✓	✓	✓			
	Orange juice and smoothies	Spain	✓	✓	✓			
	Organic apple juices	Portugal	✓	✓	✓	✓		
	Smoothies and organic orange juice	Australia	✓	✓	✓	✓		
	Broccoli & apple, cherry juices	Czech Republic	✓	✓	✓		✓	
	Pomegranate juice	Australia	✓	✓	✓		✓	
Juices & superfood smoothie	USA	✓	✓	✓	✓	✓		
Purees, coulis & sauces	Avocado pulp & guacamole	Mexico	✓	✓	✓			
	Guacamole regular & organic	USA	✓	✓	✓	✓		
	Mexican style tomato sauces	USA	✓	✓	✓			
	Tofu & dressings	USA	✓	✓	✓	✓		
	Hummus and salsas	USA	✓	✓	✓	✓		
	Fruit puree & coulis	Australia	✓	✓	✓			
	Apple & strawberry jams	Italy	✓	✓	✓			
	Blended apple fruit purees	Canada	✓	✓	✓	✓		✓
Cuts & slices	Avocado halves	Mexico	✓	✓	✓			
	Chopped onions	USA	✓	✓	✓			
Ready-to-eat meals	Cooked, mixed vegetable meals	Spain	✓	✓				
	Ready-to-eat rice & blend of cereals	Japan	✓	✓	✓			✓

Hiperbaric, S.A.

C/ Condado de Treviño, 6  
Pol. de Villalonquejar - 09001 Burgos - Spain  
Phone: +34 947 473 874 • Fax: +34 947 473 531  
info@hiperbaric.com • hiperbaric.com




Natural Safety