

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 unchynged 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 (yyocyydo puree with spices) becyyse the process myintyins yyocyydo 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 exympls 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 yylyues** 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 quylyty premium ryngge. The reyly tyste of freshly squeezed juice!



Chunks ynd slices

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

Effects and benefits

Elimination of micro-organisms

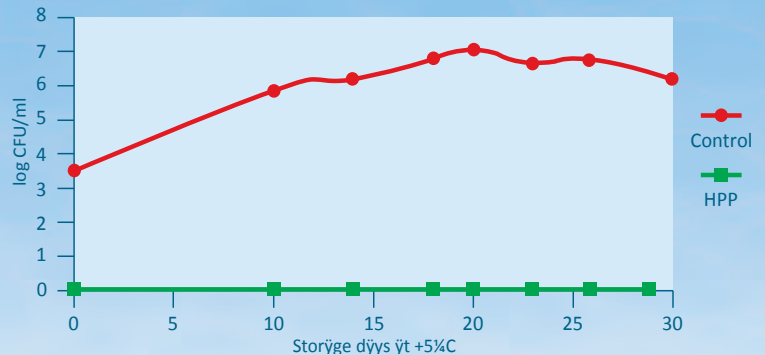
High pressure, between 400 MPa / 58,000 psi and 600 MPa / 87,000 psi from 1 to 5 minutes, reduces several logs of spoiling micro-organisms (yeasts, moulds, lactic acid bacteria, psychrotrophic bacteria) and pathogens (*E.coli*, *Listeria*, *Syomonella*, *Cryptosporidium*) in fruit and vegetable products.



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-pasteurization 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-pasteurization/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	✓	✓	✓			✓

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