Juices are typically preserved by heat-pasteurisation at temperatures above 85°C to ensure food safety and long shelf life. Although this treatment effectively inactivates microorganisms and enzymes, it often has adverse effects on the nutritional and sensorial attributes of fruit and vegetable juices.

High pressure processing (HPP) is well-known for its ability to inactivate vegetative microorganisms and some enzymes near room temperature while maintaining fresh-like characteristics better than conventional thermal processes. Thus, HPP can bring major advantages to natural and organic fresh fruits and vegetables beverages by improving safety and shelf-life and preserving sensorial and nutritional properties of the product. The natural low pH of fruits acts as a microbial hurdle and is believed to have synergistic effects on the efficiency of high pressure to inactivate microorganisms and enzymes.

Some of the first commercial applications of HPP in the food industry were for preserving fruit jams (Japan) and fruit juices (France) in the early 1990ies. However, the batch-processing mode of HPP and overall small production capacities constituted a major obstacle for major fruit juice producers at that time.

CSIRO, the national research organisation of Australia, started research on HPP of horticultural products around the year 2001 and demonstrated its potential to local for fruit processors and orchards. Several government grants ensured continued efforts to develop value adding ideas for ‘out of specification’ sized and ripened fruits with growers in Victoria.

In 2006, a business (Donny Boy Fresh Food Company) was launched offering high quality, HPP preserved apricot, peach and apple mix for yoghurt and other dairy products, which were the first of its kind and the first in the Australian market. Firstly
operating at CSIRO as a start-up incubation, it was then transferred to a new purpose built a state-of-the-art HPP and food processing facility. The then called Preshafood company introduced a range of single variety apple juices (Preshafruit) in distinctive triangular shaped bottles which took out 1st prize in the Best New Juice or Juice Drink category plus the overall prize of Best New Concept across all 24 categories at the prestigious Beverage Innovation Awards in Germany in 2009. Preshafood also won the 2011 Panasonic Australia Medium Business Award which has significantly raised its profile and profitability.

Nowadays, Preshafood is a multimillion dollar business offering a diverse range of fruit and vegetable juices, smoothies and tropical fruit mixtures for applications in dairy products and snacks. The company has also formed joint-ventures with overseas companies delivering “all natural”, preservative-free fruit products and diets-concepts for obese people.

Preshafood was strongly supported by CSIRO during the first two years evaluating the safety of their products and providing technical support on HPP for product development, enabling market testing with purchasers and securing investment.

This presentation will discuss the basics, opportunities and pitfalls of HPP applications for fruit and vegetable products in relation to food safety, quality and process validation. CSIRO’s experience and major barriers for a successful transfer of HPP technology to industry will be highlighted. Finally, the latest range of HPP products from Preshafood and other novel HPP fruit products in the Australian market will be presented.