



# Purifying juice with UV

by Gerrit Bezuidenhout

New purifying technology in fruit juice could soon provide producers with an alternative or an augmentation to existing pasteurisation methods. The use of ultraviolet light, or UV-C, is no longer the sole domain of surface and water cleaning, but has traversed the borders of turbid liquids, such as milk, wine and even juices. Greg Whyte, sales and marketing manager of SurePure, a company specialising in UV-C systems for the treatment of turbid liquids, broadens our knowledge on the use of ultraviolet light purification.

## How it works

The system has been developed by technologists at the University of Stellenbosch, and the patent is owned and managed by SurePure AG. Ultraviolet processing or purification involves radiation from the ultraviolet region of the

electromagnetic spectrum for the purposes of disinfection. Ultraviolet light is germicidal against microorganisms such as bacteria, protozoa, yeasts, moulds and algae. It is performed at low temperatures and is classified as a non-thermal disinfection method.

The usual wavelength of ultraviolet light for processing purposes lie between 100 nm to 400 nm, with the highest germicidal effect attained at between 250 and 270 nm. This wavelength is classified as the so-called UV-C wavelength. According to Greg, SurePure uses UV-C at 254 nm to purify liquids.

Ultraviolet light influences the reproductivity of the microorganism by damaging the exposed DNA of exposed cells, rendering the microorganism reproductively inactive, and unable to replicate. It has no residual effect, and is harmless to the consumer.

Although the technology has been in use for more than a hundred years, the focus has been on the purification of water, or the disinfection of surfaces. Greg says a system for the treatment of turbid liquids has been researched for ten years and has only been in commercial use for two years.

### Clean juice

"Photo purification reduces the microbial load of juice," Greg explains, "because it deactivates viruses, bacteria and other microorganisms. Moreover, since it is a non-thermal process, there is no destruction of enzymes in the juice. Photo purification can also be successfully used in conjunction with other purification methods."

The technique is used to purify fresh fruit juice, ambient aseptically packed fruit juice or in chilled fruit juice applications.

Although ultraviolet light, especially coming from fluorescent lights have been shown to alter the taste of fruit juice, Greg assures us that this is not the case with their photo purification system.

"After UV treatment, juice has a shelf life of 21 days, the same as is achieved through pasteurisation. For milk, a combination of pasteurisation and photo-purification treatment offers 17,25 days shelf life, compared to pasteurisation alone, which gives an average of 9,6 days," says marketing director, Steve Miller.

### Juice industry applications

One of the first companies to employ SurePure's UV purifying system is Lombardi Foods in Somerset West, which uses the technology to treat their range of fruit juices for Woolworths.

"This commitment to untampered, pure juice is now more important than ever. Not only for Woolworths as part of its Good Food Journey, but also to consumers who are becoming increasingly conscious of the condition and content of fresh juice," says operations director, Martin Lombardi.

Apart from the machine's efficiency, it offers a range of benefits for producers. "Photo-purification renders pasteurisation obsolete, so the saving on electricity not only has financial implications, but ecological ones as well," he says.

In juice applications the SurePure SP40 model delivers 1 000J of UV per litre and can treat up to 4 400 l per hour. This particular model is trading at around R850 000, installation and optional extras excluded.

"The system is easy to install, mobile and depending on the number of units required, does not need an inordinate amount of floor space. SurePure is therefore within the reach of small producers requiring treatments of 20 000 l per day, right up to mega-producers who need to treat millions of litres and would need to install a number of units," Miller says. **M&J**

