

Water with bacteria- killing properties

A report by Claire Rowan

A means of obtaining a continuous supply of pure, natural, clean water which has its own built-in biocidal properties has been perfected by TMI Europe of France, in partnership with Biopol of Belgium and the ANVAR Research Institute in France.

Easily inserted into a wide range of food or beverage processing lines, where it 'activates' water to give it biocidal and bacteriostatic properties, the Catallix is a biological generator that is based on natural enzyme immobilisation. The resulting flow of Active Water (Eau Activée) has been shown in tests to be effective in killing and inhibiting *staphylococcus*; *E.Coli*; *Salmonella*; *Listeria*; *Shigella*; and *Pseudomonas*.

Essentially, the Catallix system draws on an enzymatic reaction that occurs naturally in the mouth and other parts of the human body to create the ion hypothiocyanate, which is a natural anti-bacterial agent. Enzyme specialist, Biopole, has worked with TMI Europe, to perfect the performance of the technology and to provide the active perosydasic enzymes, which it extracts from milk using a process of industrial chromatography. Thanks to a new immobilisation technology developed by the companies, these perosydasic enzymes can be used continuously in the Catallix biogenerator to give a constant flow

of water containing hypothiocyanate (which is present at 44ppm).

"In the past, the difficulty has been to use the enzymic reaction on a continuous basis and so make the process cost effective," said Richard Stead of Rigest Trading, which will be marketing the system in the UK. "The Catallix is now able to recycle the natural enzyme continuously and thereby produce a consistent flow of Active Water."

According to test results, the Active Water flow has been shown to remain active for at least 10 hours and to be effective as a non-toxic alternative to chlorine, ozone and peracetic acid for killing bacteria in products such as bagged lettuce and vegetables. It can offer biocidal and/or bacteriostatic activity for a range of applications.

"Active Water is crystal clear, like sterile water. It has no smell or taste and is totally recyclable," said Mr Stead. "We have seen that it can actually improve the flavour of washed salad and vegetables because there is no chlorine deterioration in the finished product."

Successful laboratory tests have already been carried out on the effectiveness of the Catallix Active Water in killing *Salmonella* in chicken pieces, by spraying them continuously with the water.

"We have done tests on cleaning-



Used in the washing of salads 'Active Water' produced by the Catallix biogenerator can effectively replace chlorine treatment to kill or inhibit a wide range of bacteria

"Active Water is totally harmless and any of the active ions biodegrade into an innocuous material"

in-place systems where we use Active Water in the last wash cycle, once the heavier dirt has been removed, to ensure that any residual microbiological contamination is removed," said Mr Stead. "Work is currently being conducted in a cheese plant to remove any unwanted bacteria. Active Water is totally harmless and any of the active ions biodegrade into an innocuous material. So the Catallix biogenerator could be used in beverage applications, for rinsing bottles before filling, for example."

The Catallix can produce Active Water at rates from 100 litres per hour up to 10,000 litres per hour. According to the company there is no limit to the volume of Active Water that can be created because more than one Catallix biogenerator can be used at a time.

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