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Nanotech antioxidant system signals future of food ingredients

By Anthony Fletcher

06/01/2006 - Aquanova's cutting edge nanotech antioxidant system for essential oils and flavours is a signpost of where food ingredient technology in the 21st century is headed.

The product, which is marketed under Aquanova's Novasol brand as Novasol CT, is designed to help manufacturers introduce antioxidants into food and beverage products easily and effectively.

The breakthrough is that the product is a ready-to use clear solution that is both water- and fat-soluble.

"We deal with liquid substances called solubilisates," Aquanova corporate development manager Frank Behnam told **FoodNavigator**.

"These are crystal-clear solutions, more like water, that contain tiny nano-particles."



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These nano particles, says Behnam, are the key innovation behind the firm's Novasol range. The particles, called micelles, act as carriers for active substances such as antioxidants.

With a diameter of less than 30 nanometres – a millionth of a millimetre – these micelles are cutting edge.

"The reason our solubilisates are clear is that light particles can go straight through the micelles," said Behnam. "If they got any smaller, we'd be down to atomic measurements."

Behnam believes that as a result, Aquanova is uniquely placed to capitalise on the growing market for antioxidants.

"Antioxidants can be seen across the board today," said Behnam. "Refrigerated products such as salami need antioxidants to stay fresh, and manufacturers want to be able to keep high quality products even longer."

"The health benefits of antioxidants have also been long well known. As a result, this has become an established market."

In addition, Behnam is confident that Aquanova's innovations are cost-effective. "We are aware of the existing market, and have made an analysis of prices," said Behnam.

"We are confident that we are price competitive."

The other attraction of the new technology is its flexibility. The micelles can carry anything from vitamin C to vitamin E or Q10 to vitamin A, and the technology also renders hydrophilic substances fat soluble and lipophilic ones water-soluble.

Aquanova claims that the process also leaves the substances chemically unmodified and guarantees

"For business partners is that these solutions are ready to use, and there is no need for additives," said Behnam. "And because the particles are so small, they disperse evenly in products."

Novasol CT is specifically targeted at food and beverage makers looking to introduce vitamin C and vitamin E. These effective antioxidants can enhance each other synergistically in their antioxidative functions, but since ascorbic acid (vitamin C) is soluble only in water and tocopherol (vitamin E) in fats and oils, they can only interact at the interphases between the aqueous and lipid compartments.

Novasol CT however integrates both compounds within the same nano structured micelle, and hence there is no direct contact.

"Novasol CT could also be interesting for flavours and fragrance firms," said Behnam. "We're targeting the top ten players in this industry, who together have a market volume of 70 per cent. Essential oils also need antioxidants in order to stay fresh for a long time."

Aquanova is therefore confident that nanotechnology as a food ingredient technology has a very promising future. "The next step will not be about size, as we simply cannot get any smaller," said Behnam. "Below 10 nanometres, and you're at the atomic level."

"The next step will therefore be about developing new applications within the industry."

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