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## UV Pasteurization Update

by Linda McCandless

**Geneva, NY** - When Station microbiologist and food safety expert Randy Worobo unveiled a new, low-cost alternative to thermal pasteurization before 150 apple growers and cider producers at the New York State Horticultural Society's meeting in Rochester in early January, he did not realize the amount of interest it would generate.



At the meeting, Worobo identified ultraviolet light as a possible answer to *E. coli* 0157:H7 contamination of fresh cider and fruit juices. Since then, he has been inundated with requests for information and now has been an invited speaker at several meetings.

"The new design for a UV pasteurization unit should be perfect for small cider producers," according to Worobo, and has shown very promising results in preliminary testing. It is about one-quarter of the price of a thermal pasteurization unit, small, economical to run, and very user-friendly.

In the new process unveiled at the meeting, a thin film of cider was pumped past UV light at the rate of about 3 gallons per minute. Tests have shown that this particular design reduced *E. coli* 0157:H7 contamination from 100,000 microorganisms per ml to 1 organism per ml in a single pass. At the time, Worobo was hopeful that tests would prove effective against other pathogens as well.

Since its introduction in January, Worobo and the two engineers who developed the unit, Patrick Borrelli and Phil Harman, have made some modifications, streamlined the process, and come up with a new machine

(photo available). Borrelli and Harman are from Rochester-based FPE, Inc.

"The engineers have now addressed the small cider processors' need to have a unit operating at 180 gallons per hour with the possibility of operating it at 540 gallons per hour with additional UV components," said Worobo. The unit is extremely compact and simple to run. It wheels into place and only needs to be plugged in to be operational. The unit is in the final set of confirmation tests to ensure that the equivalent to thermal pasteurization is being met with a broad range of pathogens that are associated with apple cider. Numerous equipment distributors have expressed interest in representing FPE Inc. for wholesaling the apparatus.

In addition to controlling pathogens in fruit juices, the UV apparatus is being tested as a means to control problematic spoilage organisms for various fruit juices.

In addition to cider producers, others have expressed interest in this new technology, but Joe Corby of New York State Ag and Markets was quoted as saying, "This may be the silver bullet that saves the cider industry," at an FDA Apple Cider Inspections Workshop in Buffalo, NY, on February 20. Numerous people in various state and federal agencies as well as Julia Daily of the US Apple Association have offered assistance in "fast-tracking" this apparatus through FDA approval. Presently, sensory tests conducted by food scientists at the Station and nutritional analyses are being performed on the UV treated apple cider.

Nationwide, isolated outbreaks of contamination of fresh apple cider and fruit juices by the bacteria *E. coli* 0157:H7 have been causing some health problems and creating a crisis of confidence among some consumers in the past few years. The more virulent strain of *E. coli* was first identified in 1982. Producers and consumers are clamoring for more information and recommendations for safe production practices. Last year, thermal pasteurization was the process of choice, but the thermal pasteurization units cost as much as \$30,000 and are out of the reach of most small producers who rely on income generated during a four-week season in the fall to cover the costs of production.

"Preliminary tests indicate UV light causes no sensory changes in the juice," said Worobo. Further testing on feasibility and effectiveness is being conducted by Borrelli, Harman, and Worobo, in conjunction with food specialists at the Experiment Station.

The unit could cost as little as \$6,000. FPE, Inc., has applied for a patent.

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*Click on photograph to view 300 dpi version.*

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**Contact information for the UV processors developed by FPE and the Experiment Station for fruit juice is:**

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