

Pressure BioSciences, Inc. (P BIO) Patented Ultra-Shear Technology Focus of New Government-Funded Food Safety Program

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- Federal four-year grant awarded to Ohio State University to fund research program with P BIO
- Goal is development of manufacturing process to keep foods fresh without costly refrigerated transport/storage and safe without chemical additives
- P BIO's Ultra-Shear Technology ("UST") allows food manufacturers to manufacture healthier beverages and other foods that retain flavor and preserve product's wholesome ingredients, potentially affecting future food processing around the world
- Dairy alternative beverage market, which grew 18 percent from 2009 to 2014 to reach \$18.9 billion, fueled by consumers seeking tasty, nutrient-dense, convenient options for on-the-go lifestyles
- Consumers increasingly value "clean-label" foods, with 73 percent stating that they would pay more for food or drink products made safely with recognizable ingredients
- Global dairy market projected at \$442 billion by 2019 with a CAGR of six percent

Imagine food, such as milk, that doesn't go bad, tastes like the fresh product, is free of chemical preservatives and doesn't need expensive refrigerated transport or storage. Now, think of how many bottom lines of companies around the world such a technology could affect.

Global life sciences company Pressure BioSciences Inc. (OTCQB: P BIO) and its patented Ultra Shear Technology ("UST") will be used to develop an innovative manufacturing technology in a new, federally-funded research program focused on food preservation and safety at Ohio State University's College of Food, Agricultural and Environmental Sciences ("CFAES"). P BIO is a Massachusetts-based company that manufactures high-pressure-based equipment and laboratory instrumentation for the life science industry. CFAES is a worldwide leading food safety college.

P BIO's Ultra Sheer Technology produces highly stable, clean and cost-effective nanoemulsions that facilitate the production of food products with enhanced shelf lives and without the need for chemicals or preservatives, as the company notes in a recent article (<http://nnw.fm/UOP5r>). The Ultra Shear Technology, which aligns with consumer demand for chemical- and preservative-free products, can be applied across many industries, including pharmaceutical, food, nutraceutical, industrial lubricant, paint and cosmetic sectors.

Researchers at Ohio State and their PBIO collaborators announced the U.S. Department of Agriculture's National Institute of Food and Agriculture four-year \$891,000 grant in a recent news release (<http://nnw.fm/I3u4a>). PBIO's UST technology will be the basis upon which a new manufacturing technology will be developed to preserve food and beverages by reducing thermal exposure through the combined application of elevated pressure, shear, controlled times and temperatures.

A growing need to optimize processing technologies to preserve the freshness of foods while extending the shelf life without using preservatives is a key factor for researchers in this demanding, developing global market. Statista reports that, for example, the dairy market worldwide, valued at \$336 billion in 2014, is projected to grow by six percent to reach a staggering \$442 billion in 2019 (<http://nnw.fm/bcl6n>). For dairy-alternative consumers, the market is just as intriguing, with a strong demand that reached \$18.9 billion by the end of 2014 as dairy-based sports nutrition drinks gained in popularity (<http://nnw.fm/0Dj5Z>).

V.M. Dr. "Bala" Balasubramaniam, a CFAES professor of food engineering, is leading the development project, which is designed as a collaborative team effort with scientists and engineers at PBIO. Balasubramaniam believes that UST also holds the potential to be utilized by food manufacturers to ensure a healthier processing of sauces, condiments and other foods.

"Development of cost-effective, next-generation, gentler industrial food manufacturing technologies for the preservation of healthy beverages has now become a critical need," Balasubramaniam stated in the university's news release.

Edmund Ting, a senior vice president at PBIO, will lead the development of the laboratory scale and pilot plant equipment that CFAES and the company's researchers will use in the project. The UST equipment developed under the project will be used to demonstrate the UST-based processing method to the beverage and food processing industry through pilot plant demonstrations and testing at the university's advanced technology pilot plant on campus.

"It has been rewarding to see the significant growth of high-pressure food and beverage processing over the last 25 years," Ting stated in the news release. "I believe UST has equal if not greater applications than high-pressure processing, both within and outside the food and beverage industries."

The high-pressure processing equipment market is projected to reach \$500.3 million by 2022 at a CAGR of 11.26 percent from 2016, according to a report from MarketsAndMarkets (<http://nnw.fm/Ju6dB>). North America and European regions dominated this market in 2015 and are expected to continue leading as early adopters of new food processing technologies, the report states.

Consumers are increasingly looking for foods and beverage products that they believe are genuine and free of preservatives, with 73 percent stating that they would pay more for a product they trust, a Food Insider Journal article states (<http://nnw.fm/Le9eZ>). These "clean label" products brought in global

sales of \$165 billion in 2015 and are expected to reach \$180 billion by 2020. The Ultra Shear Technology-based processing method being developed by Ohio State and PBIO will be a new alternative to existing options, one that will not use high heat and will consequently offer the potential for better taste, nutritional value and safety.

“We are pleased to collaborate with experts at Ohio State to advance the commercialization of the UST platform for the food and beverage market,” Ting added, noting that the UST equipment developed with the grant will eventually be shared with the food and beverage industry through pilot plant demonstrations and testing, webinars, short courses and food processor fact sheets.

“The UST technology is expected to be particularly beneficial for medium- and small-scale food processors and entrepreneurs who otherwise have limited technical resources to evaluate such novel food manufacturing processes,” Balasubramaniam said. “The ultimate goal is for consumers to benefit from the increased availability of wholesome, healthy beverage and food options.”

For more information, visit the company’s website at www.PressureBioSciences.com

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