



PROJECT: RAW JUICE, PASTURIZATION UNDER PRESSURE

Background

Hartley Berg is a product researcher and developer, marketer and coordinator of innovative health related products. Hartley has extensive experience in new product development, new product launches, business and marketing management, with strong emphasis in administration logistics, operational and systems development, financial management, purchasing, inventory control, merchandising, sales, staff management, training and team building, customer service and prospecting of new business.

Overall project goals

To apply High Pressure Processing (HPP) technology in the development of a new non-thermal juice processing method, "Pasteurization Under Pressure (PUP)", in order to produce a shelf-stable juice product line. Compared to traditional heat pasteurization, which results in degradation of heat-labile nutrients, the PUP method – we expect – will retain the levels of the conventional nutrients and phytonutrients.

Technological Environment

Avure Technologies (Kent, Washington) has developed a high pressure process (HPP), Fresher Under Pressure®, that is acknowledged by the FDA, USDA, and the National Advisory Committee on Microbial Criteria for Foods as an alternative non-thermal pasteurization approach. High Pressure Processing is also acknowledged by the Canadian Food Inspection System Implementation Group (CFIS) as an alternative processing technology for the safety and shelf-life extension of juices.

High Pressure Process technology is currently being used to different extents in processing of guacamole, whole shell oysters, ready-to-eat meats, jams and jellies, and salsa. A 6-log reduction in food pathogens such as *E.coli*, *Salmonella sp.*, and *Listeria monocytogenes* can be achieved in less than 2 minutes. In terms of product quality, 85% of Vitamin C was retained in orange juice after HPP, even after 20 weeks of storage at 8 °C, compared to thermally processed juice whose final Vitamin C retention was only 20%.

Processing of fresh-squeezed juices is a logical next step in the expansion of HPP applications. In addition, HPP is not prohibited for use with organic foods, making HPP ideal for the preservation of juices intended for the “natural” marketplace.

Quantified Technical Objectives

- To retain greater than 85% of selected vitamins and phytonutrients in high pressure processed (HPP) juices as compared to fresh squeezed juices, and to compare these concentrations to those found in heat pasteurized juices.

Plan of Work

- (1) To conduct laboratory testing to quantify the safety and quality benefits of the Pasteurization under Pressure process as compared to fresh squeezed juice and heat pasteurized juice.
- (2) Source a co-packer and packaging for the PUP process and confirm scale-up process parameters and finished product quality.
- (3) Discuss a product patent with Avure Technologies that is specific to the optimized processing parameters

Anticipated deliverables at end of project:

Product will contain a minimum of 85% of each selected vitamin and phytonutrient quantified in the original fresh-squeezed juice. The shelf-life will be comparable to heat pasteurized juices, but will have organoleptic properties comparable to fresh-squeezed juice.

Anticipated Challenges

Possible technical challenges of this project include:

- (1) The PUP process may not result in a significant improvement in nutrient and phytonutrient retention as compared to heat pasteurized juices at processing conditions required to achieve shelf-stability.
- (2) The product may not be an organoleptic match to fresh-squeezed juice and/or the product may not be organoleptically acceptable at processing conditions required to achieve shelf-stability.
- (3) Since HPP is a new technology, production risk and/or the costs of process parameters needed to produce a shelf-stable product may be uneconomical for a co-packer to invest.

As described in Section 4.1, multiple process settings will be explored to find an optimized combination which will maximize nutrient retention and product safety / stability while attempting to keep costs competitive.

Internal Resources: Contractors

Technical Consulting/Coordinating: Fresh Ideas & Solutions Inc.

Contact: Margaret Daskis

Unit 9 – 20295 – 113B Ave., Maple Ridge, BC V2X 6E9

Tel: 604-460-0811; Fax: 604-460-0880

Technology/Processing Trials: Avure Technologies

Contact: John Reilly

22408 66th Ave. S., Kent, WA, 98032.

Tel: 800-610-1798; Fax: 253-981-6350

Analytical / Nutritional Testing: CANTEST Ltd.

Contact: Peter Taylor

4046 Canada Way, Burnaby, BC, V5G 1K5

Tel: 604-734-7276; Fax: 604-731-2386

SLC Laboratories, operated by
Seigiken Laboratories Canada Inc.

Contact: Arthur Yee
204-4475 Wayburne Drive, Burnaby, BC, V5G 4X4
Tel: 604-454-0107; Fax: 604-454-0266

BCIT Food Processing Resource Centre
Contact: Gary Sandberg
3700 Willingdon Avenue, Burnaby, BC, V5G 3H2
Tel: 604-432-8561

Microbiological Testing: I.G. MicroMed Environmental Inc.
Unit 190 – 12860 Clarke Pl., Richmond, BC, V6V 2H1
Tel: 604-279-0666; Fax: 604-279-0663

Phase 1 – Validation of high pressure processed juice quality

Objectives:

- To conduct laboratory testing to quantify the nutritional and phytonutritional content, organoleptic quality (colour, flavour, mouth feel), and shelf-stability of high pressure processed (HPP) juices.
- To compare the above to that of fresh squeezed juices and heat pasteurized juices.
- To determine optimal conditions for HPP of juices based on the above attributes and food safety.

Planned activities:

- Carry out “Pasteurization Under Pressure” technology trials by subjecting fresh squeezed juices to various conditions (maximum 3) as suggested by Avure Technologies. This will result in packaged products for further analysis.

- Analyze and document the product(s) after pasteurization for heat labile nutrients and phytonutrients, product quality, and shelf-stability / shelf-life. Heat pasteurized juices to be used as „negative control“ and fresh squeezed juice as “positive control”

Big business has been gearing towards consumer demands for health-related products by re-formulating existing products and creating new products. Companies such as Loblaws, Shoppers Drug Mart and many other multi-national companies continue to expand their natural product selection to promote and sell the benefits of natural health products. This large-scale marketing to the mass consumer offers credibility to natural health products and opens the doors to exponential growth for years to come.

To capitalize on this opportunity, the Company will utilize a strategic business model and offer consumers a new alternative in the quest for convenient and delicious ways of consuming large quantities of raw quality nutrients. The nutritional benefits of fresh-pressed fruits and vegetables are today commonly known and accepted throughout the world. Although making fresh juice is not always convenient for the average person, *Juice Booster*[™] fresh/ frozen juice cubes will provide a new approach to achieving pure quality of taste and nutrition without compromise.

For optimum quality and for the enjoyment of consuming, *Juice Booster*[™] will provide consumers a conveniently unique and delicious way to add the goodness of Fruits, Berries and Vegetables back into their beverages. The Company launch the line with ***Cranberry Juice Boosters***[™] and intends to introduce several additions to the *Juice Boosters*[™] line: Beet Juice Boosters[™], Spinach Juice Boosters[™], Pineapple Juice Boosters[™], Watermelon Juice Boosters[™] and Lemon Juice Boosters[™].

The Company will support strategic promotional activities, to include direct in-store demo promotions. Concurrently, the Company plans to market the product aggressively to retailers by providing distributors and broker's co-operative advertising and promotional incentives directed to the retail customers and end consumers.

It is management's intention to sub-contract to an existing food production facility for co-production and co-packaging of ***Cranberry Juice Boosters™***. Successful sell-through sales results in the initial testing phase will factor into advancing into the next phase of sales. Company investment into their own production facility and equipment will be predicated based only on sound financial advantages.

Juice Boosters™ have been developed to offer the consumer exceptionally high nutritional values and pure flavour that can only come from 100% fresh fruits and vegetables. Product purity and integrity will be rated as one of the top in the supplement industry. To regain lost health and to maintain vibrant health, *Juice Boosters™* are highly suitable as a proven prevention and curative for many significant health ailments suffered by millions around the globe. The body thirsts for quality food nutrient every day. Scientific evidence indicates that the therapeutic effect of food nutrient is greatest when they are in a form that is as close to their natural state as possible.

Juice Boosters™ will utilize a new advancement in product packaging. Innovative and unique to the market place, *Juice Boosters™* are individually packaged and frozen/ fresh for convenience of use and to effectively preserve nutrients and flavour. We believe consumers will receive this product as a refreshing change to the daily use of nutritional supplement pills and powders. Each *Juice Booster™* is simply 100% frozen juice cubes. They are pure; therefore, they are superior in nutritional values and

delicious taste! The Canadian Dietary Association recommends 5 servings of fruits and vegetables per day, every day. That's what you get with a couple of *Juice Boosters*™ in water or juice, every day. It's no wonder why the Juice and Smoothie Bar sector is growing at an annual rate of 30% while the fast food sector is growing at a rate of 3%. The public embraces alternatives when the concept is solid and the product exceptional.

The Company has the potential for a highly profitable business model that serves a rapidly growing segment of the economy. Although a start up business contains a high degree of risk, the strength of the opportunity, the concept, the business model, and the Company's management experience, make this a unique proposition for equity investors.

Further, we believe with the expertise the Company possesses and the sales momentum that will be generated through existing industry relationships, we have a strong ability to penetrate into this market place.