RWH HOLDINGS® (PTY) LTD (RWH®): DYNAMIC CELLULAR DISRUPTION® (DCD®) BUTTERNUT SOUP DOSSIER

Introduction and Background to DCD

Molecules found in cellular structures of meat, fruit, vegetables, berries, nuts, and seeds provide sustaining nutrition to achieve good health and wellbeing. Those molecules represent a comprehensive - across the spectrum - variety of all the macro and micronutrients necessary for human beings (and animals) to flourish.

However, current food and beverage processing methods damage the molecules, removing their efficacy and thus only achieving bulk or a sense of satiety but not much nutrition. Additionally, these existing methods cannot easily and effectively process skins and seeds (which contain significant nutritional properties), or radically reduce the fibre particle size to a level that will not upset the organoleptic sensibilities of the consumer. Therefore, a conventional processor ends each day with not only a large pile of waste, which impacts the environment but, also a product that has vastly reduced nutritional profile. Ironically, the waste represents the majority of the raw material molecules that are required for optimal nutrition. The waste also represents most of the fibre, which if ingested, would aid other nutritional and health benefits but instead, leaves consumers fibre deficient.

RWH, under license, can process food and beverages through a patented process called DCD utilising a piece of technology called the Disruptor™. Disruptor technology deploys a non-thermal, non-chemical process that opens 99.999998% of all cell structures. During the DCD process, other than pipe loss, which is the same volume irrespective of the production size, there is no waste product and the plant material is used in its entirety. DCD renders bio-available, all the molecules for the body to utilise. DCD does not manufacture molecules but instead, extracts what is available within the cell structure, more efficiently. This is from the source material and therefore outcomes are wholly reliant on the source material itself.

DCD also reduces microbiological contaminants, yeasts and moulds found in source materials. Therefore, the product that has passed through the Disruptor will show improved microbiological cleanliness.

In short, the DCD process and Disruptor technology increase the available nutrition per serving, reduce particle size and waste, which has a positive impact on the consumer as well as the environment. The increased extraction of molecules signifies an increase in yield, and with the utilisation of what would normally be considered waste, has a positive economic impact on the processing value chain.

Conventional versus DCD processing: Butternut Soup

Conventional manufacturing of butternut soup entails after washing of the materials, the skinning, seed removal and cutting up of the butternut, which is then put into a large pot to boil for several hours in order to soften the butternut to make it edible. This is labour, time and energy intensive and generates waste that still needs to be managed. In short, in one soup kitchen we are conducting

production trials for, it takes three hours to produce 300kg of soup and they do that three times a day.

However, butternut soup manufactured through DCD and Disruptor technology, may process at a rate of 600kg/hour, therefore 1800kg for the same time as described above. There is no waste in the soup kitchen, they would merely pour the prepared soup into the pot, augment as required (water to dilute, seasoning additional ingredients etc.), heat and serve with all the benefits as described in the "Introduction and Background" above.

RWH processing facility certification and accreditation

The Certificate as at Appendix 1, RWH's processing plant in Ndabeni, Cape Town is an ISO 22000:2018, ISO 9000, HACCP, GMP certified and FDA accredited facility. ISO 9000, HAACP and GMP are all incorporated in the ISO 22000:2018 certification as sub-sections to the required standards. This determines that there are strict cleanliness and traceability protocols and processes in place for all products processed in the facility.

Butternut soup testing methodology

To show that DCD and Disruptor technology adds value to food and beverage manufacture, as opposed to conventional processing methods, samples were taken of the pre-DCD and post DCD soup material and sent for the following tests at accredited commercial or academic laboratories:

1. University of Stellenbosch for pre- and post-DCD amino acid profile measurement.
2. SGS for pre- and post-DCD microbiological and heavy metal measurement.
3. Hearshaw and Kinnes for pre- and post-DCD pesticide residue measurement.
4. A letter from **Citrosuco**, who is currently utilising DCD and Disruptor technology in a commercial role, endorsing DCD for manufacture of products for human consumption.

Phyto-Chemistry test results: Amino Acids (protein)

The test report as at Appendix 2 from the University of Stellenbosch, an internationally recognised academic facility, measured proteins as a marker to show improvement using DCD and Disruptor technology because it is one the most important building blocks in the human diet. The report shows an average protein increase of 132.7%.

This translates into using less raw material to achieve the same level of nutrition, which promotes food security as well as improved nutrition for the consumer. One needs to also consider that ordinarily, 40% of a butternut is thrown away (that is 400kg for every ton processed), which is now all in the soup and therefore a much higher fibre content in included, which promotes amongst other benefits, bowel health - normally absent from fruit and vegetable extractions.

Also consider that you have added 40% of so-called 'waste' back into the soup, which is mostly fibre and despite that diluent effect, the proteins are still measuring 132.7% higher.

These results prove that there is a substantial increase in the extraction and release of phyto-chemistry from the source material using DCD and Disruptor technology.

Microbiological test results

The test reports as at Appendix 3 and 4 from SGS, a SANAS and internationally accredited laboratory, measured total plate count for microbiological activity, yeasts, and moulds. It found that there was a 700-fold decrease in total plate count from 420000cfu/g to 600cfu/g between the pre-DCD and post-DCD samples. It also reduced yeasts and moulds to "not detected" from 5200cfu/g and 80cfu/g, respectively.

This is a significant improvement because of the Disruptor bearing in mind that food standards require results to show less than 100000cfu/g and 1000cfu/g for total plate count and yeasts/moulds, respectively.

This result proves that DCD and Disruptor technology has a positive effect on the reduction of microbial activity in the source material.

Heavy metal test results

SGS's, test reports as at Appendix 3 and 4, measured heavy metals typically tested for food and beverage production safety, those being, mercury, cadmium, lead, and arsenic. All the results are < 0.01 mg/kg where normal production (depending on source) will allows < 3mg/kg, <1mg/kg, <0.1mg/kg and <3mg/kg, respectively. There is no difference from pre-DCD to post-DCD proving that DCD and Disruptor technology do not increase the prevalence of heavy metals.

Pesticide residue test results

Hearshaw and Kinnes (H+K), a SANAS accredited laboratory, test reports as at Appendix 5 and 6, measured for residual pesticides in the butternut soup samples, they found Benzalkonium Chloride at a residue rate of 0.70 mg/kg and 0.40mg/kg from pre-DCD to post-DCD respectively. The decrease of about 42% is indicative of the inclusion of all the butternut skins and seeds, which has diluted the residue measured proportionately.

H+K also tested for approximately 250 other residual pesticide compounds of which, none were detected above their reporting limits as can be seen from the attached reports.

The Benzalkonium Chloride is a compound found in the SABS approved sanitisers, disinfectants, and detergents that RWH is mandated to use as per ISO 22000:2018 certification requirements to effectively achieve Clean in Place (CiP) in processing spaces. The Material Safety Data Sheets are attached as at Appendix 7, 8, and 9, proving their SABS compliance's.

The Lethal Dose Median (LD50) for Benzalkonium Chloride is 240mg/kg, which would mean that a consumer would need to ingest 600kg of the butternut soup concentrate in one sitting for there to be a 0.5 probability of any toxic effect. This is shown to be more improbable if one considers that the concentrate processed by RWH is diluted on average, four times, which means that a consumer would typically have to ingest 2400kg of soup in one sitting for there to be a 0.5 probability of any toxic effect.

This proves that DCD and Disruptor technology does not release or increase any additional pesticide residue and the soup is safe for human consumption. In fact, it further shows that DCD and Disruptor technology reduces residues due to dilution of added so called waste material.

Letter of endorsement for DCD from Citrosuco GMBH

By way of introduction: Citrosuco, hyperlink in "Butternut soup testing methodology" paragraph above, is a Brazil-based manufacturing company, headquartered in Austria, whose products cover more than 100 countries across North and South America, Europe, Asia, Africa, and Oceania. Citrosuco produces 100% natural juice and orange-based derivatives and takes full advantage of the oranges they process. Citrosuco oversees growth, production and delivery and has become the largest orange juice producer in the world. They have grown in a sustainable way and contribute to people's health, quality of life and well-being.

Citrosuco is currently deploying DCD and Disruptor technology in parts of their processing facility with aspirations to grow this technology even deeper into their processing facilities. The letter and supporting laboratory reports from Citrosuco endorsing the use of DCD and Disruptor technology,

as at Appendix 10, paraphrased, say that Citrosuco supports the use of this technology to generate food/beverage products for use in formulations for the benefit of consumers.

DCD and Disruptor technology is therefore, endorsed to not harm the raw material and that the outcome is able to be used in production for human consumption without any negative effects.

DCD butternut soup supporting documentation

Each batch processed by RWH is dispatched in the prescribed and client directed packaging, along with a Certificate of Analysis (COA) and Material Safety Data Sheet (MSDS), examples as at Appendix 13 and 14. An invoice, not enclosed, will also form part of this documentation. RWH is willing to add any other legal documentation that may be required by each client's administrative requirements.

Conclusion

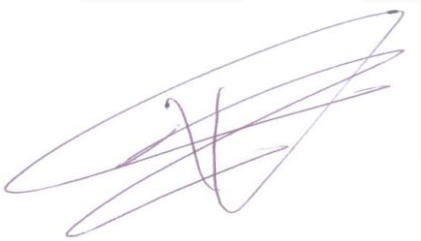
Conventional processing of food and beverage consumer products does not efficiently extract nutritional compounds, it produces lots of waste, which is usually the true goodness, and reduces fibre in the final product, when compared to DCD and Disruptor technology.

DCD and Disruptor technology will reduce microbial loading and save preparation time in feeding/soup facilities. This means that the feeding facility will be able to serve more people and more often, which is enhanced productivity and promotes food security, than the same amount of source materials processed using conventional means.

RWH is an accredited and certified facility, able to produce sufficient product that will assist with feeding those in need, and with a nutritionally meaningful product. The processed products by RWH can be dispatched as per specification and with the correct supporting documents.

The testing of the butternut soup has shown that there is a substantial release in protein and one can deduce that this will extend to other phyto-chemistry as well. The butternut soup is microbially and heavy metal clean and fit for human consumption. It can also be concluded that DCD and Disruptor technology does not release additional heavy metals and pesticide residues.

Given that the largest producers of orange-based products in the world are deploying DCD and Disruptor technology and who have shown that this process and technology can be used with no side effects in the manufacture of products for consumers, it can therefore be concluded that this technology is suitable for providing products to soup kitchens in South Africa, to feed the needy.



(R.W. HENDERSON)
Chief Executive Officer: RWH Holdings (Pty) Ltd
20 June 2020

LIST OF APPENDICES

1. ISO 22000:2018 Certificate.
2. University of Stellenbosch Amino Acid Measurement.
3. SGS Pre-DCD Microbiological and Heavy Metal Measurement.
4. SGS Post-DCD Microbiological and Heavy Metal Measurement.
5. Hearshaw and Kinnes Pre-DCD Pesticide Residue Test Report.
6. Hearshaw and Kinnes Post-DCD Pesticide Residue Test Report.
7. Material Safety Data Sheet Chlorguard.
8. Material Safety Data Sheet Germ Guard.
9. Material Safety Data Sheet Maxidet.
10. Citrosuco Letter of Endorsement for Use of DCD in final Product Formulations.
11. Spare.
12. Spare.
13. Certificate of Analysis: DCD Butternut Soup.
14. Material Safety Data Sheet: DCD Butternut Soup.