

fruit juice

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FOCUS

A close-up photograph of two hands holding a clear glass filled with vibrant green juice. The hands are positioned on either side of the glass, with fingers gently gripping it. The person holding the glass is wearing a white, chunky-knit sweater. The background is a soft, out-of-focus white texture. The overall mood is clean, fresh, and healthy.

COMBATTING SUGAR REDUCTION

Decarbonising the F&B sector

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FEATURE

Sugar reduction technology



The juice innovation table: Technology for sugar reduction

Kim Anderson, Director, Business Development and Sales, NewTree Fruit Company and Beth Warren, Founder, Creative Food Minds write.

Growth opportunities exist across the world for juice beverages due to their popularity with global consumers. The market driver for this growth opportunity is the healthy perception of the naturally occurring nutrients provided by juice. However, the concentration of sugar in juices and beverages that include juice is a rising concern for many consumers seeking healthier lower sugar options in beverages.

Sugar content

The high percentage of sugar in juice, as well as beverages that contain juices or simple syrups, has been receiving more negative attention by consumers and health care providers because of the rising population and demographic health statistics related

to the onset of diabetes, heart disease and obesity across the globe. The average level of sugar in all varieties of juice is 30 grams per 8oz serving or 8 teaspoons of sugar. Higher sugar levels often reduce the number of occasions where juice is selected by a consumer as the beverage of choice beyond breakfast and throughout the day due to sugar content, as well as the calories. The increased demand for lower sugar food and beverage products is growing at 8-9% per year.

Rising juice trends

Mintel recently reported, "In the US, health-conscious juice trends are also on the rise. The 2023 Mintel US Juice and Juice Drinks Report reveals that 40% of US juice and smoothie drinkers are drinking more juice compared

to a year ago as a way of increasing their vitamin intake. Consumers' heightened interest in healthier diets and their stronger intention to incorporate more nutrient-dense drinks into their daily lives presents significant opportunities for brands to capitalize on." However, both nutrition and lower sugar levels must be achieved to meet the consumer expectations with health and wellness.

Technology for sugar reduction

There is a significant opportunity to improve nutrient density while formulating natural juice beverages and for lowering sugar levels. NewTree Fruit Company (NTFC), based in Traverse City, MI is a world-leading technology company and the only

company to do both. Current sugar reduced beverages in the marketplace rely on dilution with water to lower the sugar and calorie counts, which also dilutes the nutrition. NewTree's patented technology for De-Sugaring juice reduces sugar to 0g per 8oz serving. This unique process maintains the taste and natural colour consumers expect, while elevating the full nutritional value from one to two servings of fruit. Chad Anderson, Co-Founder and CEO, NTFC said, "Consuming less sugar is a top priority for consumers today and the expectation is that healthier products must also taste great," He adds, "we have accelerated our production capabilities to meet this ongoing demand over the last two years with further expansion plans in 2024-2025. The NewTree Fruit Company has a variety of natural and organic sugar free juice concentrates that serve to enable low sugar product innovations that achieve a more robust nutritional panel and provide great fruit taste for food and beverages.

The NewTree Company has a patented technology for juices that removes 100% of the naturally occurring sugars (fructose, sucrose, glucose) without diluting the nutrient density. Today, the opportunity for sugar reduction is more easily achieved with the inclusion of these De-Sugared Juice concentrates.

Antioxidants

It is well accepted that antioxidants in plant foods, like fruits and vegetables, are beneficial to health and wellbeing. Apart from vitamins and minerals, polyphenolic types of phytochemicals found in fruits and vegetables are responsible for their colour, flavour, and antioxidant activity. Vibrantly coloured fruits have complex mixtures of beneficial polyphenols, as well as naturally occurring sugars. Some fruits, like blueberries and elderberries, also have



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very high levels of recognized health promoting polyphenols. The NewTree De-Sugared fruit juice is 100% juice and retains these beneficial nutrients minus the sugar.

The technology process

NewTree Fruit Company were the first to patent and commercialize a culturing method to extract sugar from fruit juice without the use of enzymes or chemicals. This unique process maintains the nutritional density of the juice while maintaining the original acid profile. "Aside from 2020, fruit juice sales have been on the decline due to increased scrutiny over the sugar content" states Kim Anderson, Director of Business Development and Sales, NewTree Fruit Company." She adds, "Our technology greatly benefits the fruit growers and juice manufacturers by increasing the demand for fruit juice concentrates in the marketplace. We're excited to partner with brands to incorporate our De-Sugared concentrates as an ingredient into their products and our goal is to be the biggest buyer of fruit juice concentrates in the world." De-Sugared juice concentrates are

versatile ingredients and have proven to be valuable in reducing the sugar of a variety of food and beverage applications including: 100% juices, juice beverages, smoothies, flavoured waters, sports hydration, protein drinks, frozen desserts, confectionery inclusions, and gummies, RTD cocktails, beers and zero-proof cocktails.

De-sugared flavours

The NewTree De-Sugared juice concentrates resemble the fruit from which they are sourced. Apple, pear, and grape are considered the most versatile concentrates for use by beverage developers and serve to be the best base for development due to milder taste profile and cost effectiveness. Characterising flavours may then be added to the formula to tailor the profile of the beverage. De-Sugared Apple juice concentrate is selected as the primary base while also including various smaller amounts of other De-Sugared juices like lemon, lime, pineapple or even cranberry or sweet cherry to add natural flavour as well as natural colour variety.

Table 1. Apple juice, lower sugar formulation:

Partial sugar replacement: 30% sugar reduction, 100% juice

Ingredient	Level %	Taste Profile
Apple Juice, Full Sugar	70	
De-Sugared™ Apple Juice Concentrate	30	
	100	No perceived change in flavour or mouth feel

*Taste profile results through consumer preference testing

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Formulating low sugar juice, De-Sugared juice characteristics

Labelling: The 30% De-Sugared Apple Juice may be listed above the nutrition facts panel and on the front of label.

Estimated cost impact: ~USD0.03-USD0.05 per 8oz serving, dependent upon the volumes and juice varieties.

Orange juice, lower sugar formulation: Similar results were found in replacing 30% of the full sugared orange juice with De-Sugared Apple Juice (0% sugar). The taste profile and mouth feel had no perceived difference in a triangle sensory test when compared to full sugar orange juice.

The impact of the sugar tax

In 2014, Mexico implemented a sugar tax on sugar-sweetened beverages. To date, over 50 countries have implemented taxes in an effort to reduce the consumption of beverages with high levels of sugar.

Recently, Mexico has reported that these taxes have reduced consumption of these types of beverages and led to reformulation of products to reduce sugar levels.

Table 2: Apple juice nutritional comparison: Full sugar apple juice compared with a 30% reduced sugar apple Juice formulated with De-Sugared Juice

Full Sugar Apple Juice	30% Reduced Sugar Apple Juice
110 calories	90 calories
27g carbohydrates	20g carbohydrates
25g sugar	17g sugar
250mg potassium	250mg potassium

Serving: 8 ozs/240ml

In most cases, the primary tool for formulators was to reduce the level of sugar, as well as other naturally occurring nutrients, by diluting the formula with water and then adding back flavours and supplementing the beverages with vitamin C.

In the UK, a Sugar-Sweetened Beverage (SSB) tax called the Soft Drinks Industry Levy was introduced in 2018. The tax is calculated based on the sugar level. All drinks containing 5-8 g of sugar per 100 ml are taxed. Fruit juices and smoothies have not been eligible for the tax currently as the presence of sugar in juices and smoothies was considered naturally occurring and not an addition. However, it is currently being recommended to adapt the

UK tax levy to include juices and smoothies because they are above the recommended sugar level. The sugar level is too high.

The limited ingredient toolbox for beverage formulators to reduce sugar in beverages has been primarily through dilution with water along with the use of non-caloric sweeteners.

The current opportunity to include De-Sugared juice concentrates provides the product developer with a natural source of flavour and colour without adding sugar to the beverage. This is while including a clean label ingredient which boosts the overall nutrition panel while maintaining the targeted taste profile.



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Formulating lower sugar beverages

If the target for sugar level reduction is greater than 25%, then the De-Sugare Juice is utilized along with additional ingredients to achieve the desired taste profile and mouth feel. Sugar provides not only sweetness and flavour, but also mouth feel to a beverage. When reducing sugar impact by 30% in a full sugar beverage, the perceived change in mouth feel is not typically detected in sensory tests. However, to achieve a lower level of sugar (30% reduction) while also maintaining consumer preference in sweetness and mouth feel, the addition of hydrocolloids along with natural sweeteners may be included at low levels.

Benefits of Desugare Juice as an ingredient

- 100% juice with 0% sugar
- Expands market opportunities for fruit farmers and juice manufacturers
- Nutrient dense with vitamins, minerals and polyphenol compounds naturally present in the sourced fruit
- Clean label
- Vibrant natural colour concentration from the sourced fruit

Table 3: Pineapple juice beverage example: Base formula example with 96% less sugar and carbohydrates than full sugared Pineapple Juice

Base Formula %	Ingredient	Grams/Liter
100% single strength equivalent (@12.8° Brix)	Pineapple Juice Concentrate, De-Sugared™	38.80
0.1%	Pectin (adds mouth feel)	1.0
200 ppm	Stevia extracts	0.2
0.2%	Natural Pineapple Flavour	2.0
	Water to Finish	-958 ml

Calories: 20 calories compared to 135 per 8fl oz serving
Potassium level: 380 mg per 8fl oz serving, retained

- Versatile fruit profiles including apple, grape, lemon, cranberry, cherry, pineapple, pear, blueberry, and more
- Natural and organic juice concentrate certifications
- Combinations of juice concentrates practical without adding unwanted sugar, carbohydrates or calorie
- Ability to tailor level of De-Sugared fruit juice inclusion based on finished product, (example: 1-3% for sparkling fruit water or 35% for a canned cocktail)

Summary

The juice innovation table has now expanded for product developers seeking lower sugar levels in food and beverages while improving the nutritional panel with the use of De-Sugared Juice concentrates from NewTree.

The market for fresh fruit and juice has also expanded with these new healthier categories for lower sugar food and beverage innovations that consumers crave. ●

Note: De-Sugaring™ and De-Sugared™ are Trade Marked.

To find out more visit <https://www.newtreefruit.com/technology-innovation>