

CLEAN LABEL

PRODUCT DEVELOPMENT WITH SWEET POTATO JUICE CONCENTRATE:

**REPLACING UNDESIRABLE
SWEETENERS AND CREATING
ON-TREND APPLICATIONS**



Carolina Innovative
Food Ingredients, Inc.



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Clean Label Product Development with Sweet Potato Juice Concentrate: *Replacing Undesirable Sweeteners and Creating On-Trend Applications*

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Sweet potato juice concentrate (SPJC) offers product developers the opportunity to add the health and functional attributes of sweet potatoes to many applications.

Consumers have long been aware of sweet potatoes as a seasonal food, but recent diet trends have raised the profile of the traditional American vegetable all year round. According to the USDA, consumption has increased more than 70 percent in the past 12 years, as consumers have grown more aware of the sweet potato's richness in vitamin A, beta carotene, complex carbohydrates, and fiber.

Most of this growth has been focused on a few specific applications, especially chips and fries. However, sweet potato juice concentrate (SPJC) offers product developers the opportunity to add the health and functional attributes of sweet potatoes to many more applications. In particular, SPJC allows replacement of many conventional sugars that have fallen out of favor with today's savvy consumer. The ambient temperature stable ingredient from CIFI is approximately 65 Brix, making it a good choice for chefs and food scientists seeking a high-intensity sweetener to replace high fructose corn syrup (HFCS) and other undesirable ingredients. SPJC's pleasing aroma, flavor notes, color, and viscosity are compatible with

fruits, vegetables, meats, dairy ingredients, baked goods, and vegetable oils with no discernible color loss or bleed due to processing or storage conditions. The flavor profile is warm and similar to caramel, which means that no added brown sugar or molasses is required for applications like barbecue sauces, which often require such ingredients. Its consistent viscosity also enables reduction of added starches and gums due to the natural starch content of SPJC. This clean label, all natural ingredient may also be used as a direct or partial replacement for high fructose corn syrup in products like ketchup, sauces, beverages and marinades.

Applications Using SPJC 65 Brix

Recent trials and formula development have found that the versatility and functionality of SPJC is superior to conventional and newer sweeteners. It does not impart the after-taste often associated with artificial sweeteners, and its naturally occurring viscosity makes for ease of formulating. The following applications have been carefully tested and represent promising areas where SPJC can be employed to boost the health and trend appeal of a formula.



1. Salad dressings

A variety of oil-based salad dressings have been created and shown to approving panelists, including two styles of vinaigrette and a California French dressing. No added emulsifiers are required to provide appealing mouthfeel and appearance, and SPJC allowed the production of formulas free of HFCS and low in added thickeners and colors.

2. Barbecue sauces

In barbecue sauces the natural caramelized and browned flavor notes from

the sweet potato provide rich, harmonious flavor attributes without the addition of traditional but less appealing ingredients such as HFCS and caramel color. In addition to creating a cleaner label, SPJC produces a better tasting finished product in prototypes such as a Kansas City or Korean style barbecue sauce.

3. Ketchup

New ketchup formulas designed with a cleaner label are growing in popularity, and SPJC can make a contribution here as well. Prototype ketchups replacing all or part of the HFCS have been well accepted by panelists, retaining the texture and flavor of the classic condiment with a cleaner ingredient deck.

4. Smoothies and other beverages

For beverages requiring body and smoothness, SPJC fits the bill paired with yogurt or similar full-bodied ingredients. The color, flavor, and mouthfeel imparted by the sweetener is a welcome addition to products in this category, such as a recently developed smoothie featuring orange juice, Greek yogurt, and SPJC.

5. Marinades

Marinades represent another application group that has historically featured some cluttered ingredient profiles, a problem SPJC can help solve. When marinades made with SPJC are applied to grilled meats and seafoods, the caramelization of the sweet potato is evident in the color and flavor, without the excessive charring caused by artificial sweeteners.

6. Dairy

The most unanticipated benefit of using SPJC occurs when combining it with dairy ingredients like sour cream, cream cheese, Ricotta cheese, and other soft natural cheeses. For spreads, dips, and sauces, the viscosity and flavor are compatible with the naturally occurring components in cheeses. A vegetable dip made with SPJC and cream cheese offers a complex flavor profile and attractive light orange color.

7. Baked goods and snacks

All bakery products, nutrition bars, and snacks are obvious candidates for the sweetener. Total replacement of HFCS or partial replacement of other sweeteners has been accomplished in multiple formulations, including a naturally sweetened energy bar.



8. Non-dairy caramel

Perhaps the most exciting possibility enabled by SPJC is the creation of non-dairy and vegan caramel sauce. In addition to serving as a

source of sweetness, SPJC supports the proper body and mouthfeel for these applications and imparts a warm flavor profile. A sample formula has been created and shown as a dip. It could also easily be thinned to serve as a topping.

With no such product currently on the market, the introduction of CIFI's SPJC to the market offers enterprising food companies the chance to launch a truly innovative caramel application that meets growing consumer desires for free-from products.

Conclusion

SPJC is a great addition to the lineup of sweeteners available today to chefs and scientists. Its outstanding nutritional profile, great flavor and

color attributes, and consistent viscosity make it the sweetener of choice for the applications mentioned and others to be discovered by the creative formulator.

Carolina Innovative Food Ingredients (CIFI) offers the only line of sweet potato juice ingredients guaranteed to be grown and processed entirely in the United States. Our traceable, clean label product offers numerous possibilities as an alternative sweetener and vegetable ingredient. As you consider new application ideas and innovative formulas, consider SPJC for a functional, flexible contribution to your ingredient deck.

6 OUT OF 10 CONSUMERS SEE
SWEET POTATO JUICE
AS **HEALTHIER** THAN LEADING
FRUIT BASED SWEETENERS



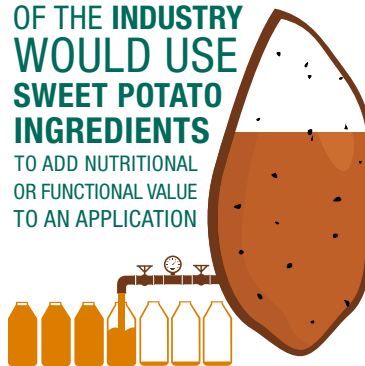
67% OF CONSUMERS
WOULD **PAY MORE** FOR
PRODUCTS CONTAINING
SWEET POTATO
INGREDIENTS



95% PERCEIVE
SWEET POTATOES
AS A **HEALTHY FOOD**



MORE THAN
HALF
OF THE **INDUSTRY**
WOULD USE
SWEET POTATO
INGREDIENTS
TO ADD NUTRITIONAL
OR FUNCTIONAL VALUE
TO AN APPLICATION



Nutrition Facts

Serving size 1 cup sweet potato granules

Good source of fiber and beta carotene

Good source of vitamins and minerals

Diabetic friendly

*Percent Daily Values are based on a 2,000 calorie diet.
Your daily values may be higher or lower depending on
your calorie needs.

Results from surveys conducted through North Carolina State University and Food Processing