New Trends in Processed Fruit and Vegetable Products

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Clearwater Beach, FL

presented by

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iTi Tropicals, Inc.
What We Will Cover...

• Processing – Fresh is Best!

• Trends in Processed Fruits & Vegetables

• Fruits & Vegetables: A Closer Look
FRESH IS BEST
High-Pressure Pasteurization (HPP)
## HPP & Heat: A Comparison

<table>
<thead>
<tr>
<th>HPP</th>
<th>Heat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instantaneous transmission</td>
<td>Slow transmission</td>
</tr>
<tr>
<td>No pressure gradients</td>
<td>Temperature gradients</td>
</tr>
<tr>
<td>Identical in every point</td>
<td>Not uniform</td>
</tr>
<tr>
<td>Cold temperature</td>
<td>Temperature damages organoleptic quality</td>
</tr>
</tbody>
</table>
What HPP Is Not...

- HPP is not shelf stable sterilization
- HPP will not kill spores
- HPP will not stop oxidation
Trends in Processed Fruits & Vegetables

• world fruit and vegetable juice market is predicted to near 65 billion liters by 2015

• growing demand for beverages made from organic ingredients

• bad press due to their high-fructose (perception!!!) corn syrup (HFCS) content → juice manufacturers offering juices without (HFCS)
Trends - Positioning in the Marketplace

Fruit juices and 100% fruit juice-puree mixtures ("smoothies" with 100% fruit content)
– more convenient to consume
– in general have a longer shelf-life than fresh fruit...also shelf stable vs. refrigerated

Moderate intake of juices along with fruit is deemed to be completely appropriate by the 5+ a day program and can help the consumer to reach the dietary recommendations...pouches...
Blending Fruits & Vegetables

• Vegetable flavors are being featured strongly, often in combination with fruit flavors, in juices, smoothies and teas.

• There are also some unpredictable trends/combinations as well.
Trends in the News

NEW FLAVOR TRENDS

Dark choc + cucumber? Trailblazer Foodpairing moves beyond flavor combinations to whole recipes

By Elaine WATSON 29-Aug-2013

Related tags: Foodpairing, Flavor
Related topics: R&D, Flavors and colors
Caloric Load & Impact

Low Brix vegetable juice products like cucumber, lettuce, etc. deliver less calories while still being 100% juice.

<table>
<thead>
<tr>
<th>Juice Type</th>
<th>SS Brix</th>
<th>kcal/100g</th>
<th>kcal/fl. oz.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beet</td>
<td>7.0</td>
<td>24</td>
<td>6.5</td>
</tr>
<tr>
<td>Celery</td>
<td>3.1</td>
<td>8</td>
<td>2.2</td>
</tr>
<tr>
<td>Cucumber</td>
<td>3.0</td>
<td>9</td>
<td>2.3</td>
</tr>
<tr>
<td>Romaine Lettuce</td>
<td>2.7</td>
<td>17</td>
<td>4.6</td>
</tr>
<tr>
<td>Sweet Potato</td>
<td>10.0</td>
<td>34</td>
<td>8.8</td>
</tr>
<tr>
<td>Butternut Squash</td>
<td>10.0</td>
<td>45</td>
<td>11.8</td>
</tr>
<tr>
<td>Kale</td>
<td>5.0</td>
<td>14</td>
<td>3.7</td>
</tr>
<tr>
<td>Purple Sweet Potato</td>
<td>10.0</td>
<td>34</td>
<td>8.8</td>
</tr>
<tr>
<td>Red Bell Pepper</td>
<td>6.0</td>
<td>20</td>
<td>5.3</td>
</tr>
<tr>
<td>Red Tomato</td>
<td>5.0</td>
<td>8</td>
<td>2.0</td>
</tr>
<tr>
<td>Spinach</td>
<td>2.6</td>
<td>8</td>
<td>2.0</td>
</tr>
<tr>
<td>Yellow Carrot</td>
<td>8.0</td>
<td>30</td>
<td>7.9</td>
</tr>
<tr>
<td>Yellow Tomato</td>
<td>5.0</td>
<td>8</td>
<td>2.1</td>
</tr>
<tr>
<td>Grape</td>
<td>16</td>
<td>65</td>
<td>16.7</td>
</tr>
<tr>
<td>Apple</td>
<td>11.5</td>
<td>47</td>
<td>12.3</td>
</tr>
<tr>
<td>Orange</td>
<td>11.8</td>
<td>45</td>
<td>11.7</td>
</tr>
</tbody>
</table>
“Veggie Stuff”

• We all need to consume more vegetable servings; everyone knows “it’s just good for you!”
• Vegetable juice concentrates add highly desired vegetable servings.
• Adding small amounts to your formula can easily provide 1 cup of vegetables.

<table>
<thead>
<tr>
<th>Vegetable</th>
<th>Brix</th>
<th>Weight Needed to Equal 1 Cup Serving</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cucumber</td>
<td>60</td>
<td>.40oz</td>
</tr>
<tr>
<td>Carrot</td>
<td>28</td>
<td>2.29oz</td>
</tr>
<tr>
<td>Beet</td>
<td>25</td>
<td>2.24oz</td>
</tr>
<tr>
<td>Tomato</td>
<td>25</td>
<td>1.6oz</td>
</tr>
<tr>
<td>Sweet Potato</td>
<td>60</td>
<td>1.33oz</td>
</tr>
<tr>
<td>Squash (Butternut)</td>
<td>25</td>
<td>3.2oz</td>
</tr>
</tbody>
</table>
Trends in the News

15 Best Superfoods for Fall

By the Editors of Health.com
Sept. 7, 2013

The weather is getting cooler, but your produce choices are heating up.

These amazing superfoods are either hitting their peak in the garden or can easily be found in your local farmers market or grocery store.

They're the perfect excuse to get cooking on cool nights!

Best Superfoods for Weight Loss
<table>
<thead>
<tr>
<th></th>
<th>ABC News</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apples</td>
<td>Sweet Potatoes</td>
</tr>
<tr>
<td>Brussel Sprouts</td>
<td>Turnips</td>
</tr>
<tr>
<td>Parsnips</td>
<td>Pomegranates</td>
</tr>
<tr>
<td>Pears</td>
<td>Dates</td>
</tr>
<tr>
<td>Rutabaga</td>
<td>Kiwi</td>
</tr>
<tr>
<td>Cauliflower</td>
<td>Grapefruit</td>
</tr>
<tr>
<td>Squash</td>
<td>Tangerines</td>
</tr>
<tr>
<td>Pumpkin</td>
<td></td>
</tr>
</tbody>
</table>
Innova Market Insights Will Present the Latest Soft Drink Trends and Emerging Flavors at the IFT Food Expo

Innova Market Insights will report on the latest soft drink trends and emerging flavors at its Taste the Trend Pavilion [booth #1576], at this year's IFT Food Expo in Chicago (July 14-16). Daily live presentations at the booth will include the topic "Health Drives Flavor Hits."
# Uncommon Fruits & Vegetables

<table>
<thead>
<tr>
<th>Uncommon Fruits &amp; Vegetables</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cherimoya</td>
</tr>
<tr>
<td>Tomatillo</td>
</tr>
<tr>
<td>Coconut Water</td>
</tr>
<tr>
<td>Sea Beans</td>
</tr>
<tr>
<td>Meyer Lemon</td>
</tr>
<tr>
<td><strong>Mangosteen</strong></td>
</tr>
<tr>
<td><strong>Lucuma</strong></td>
</tr>
<tr>
<td>Pummelo</td>
</tr>
<tr>
<td>Durian</td>
</tr>
<tr>
<td>Star Fruit</td>
</tr>
<tr>
<td>Loh Han Guo/Monk Fruit</td>
</tr>
<tr>
<td><strong>Baobab</strong></td>
</tr>
<tr>
<td>Dandelion Greens</td>
</tr>
<tr>
<td>Goji Berries</td>
</tr>
<tr>
<td>Kiwano Melon</td>
</tr>
<tr>
<td>Rambutan</td>
</tr>
<tr>
<td>Banana</td>
</tr>
<tr>
<td>Dragon Fruit</td>
</tr>
<tr>
<td>Granadilla</td>
</tr>
<tr>
<td>White Asparagus</td>
</tr>
<tr>
<td>Kumquat</td>
</tr>
<tr>
<td>Ugli Fruit</td>
</tr>
<tr>
<td><strong>Soursop/Guanabana</strong></td>
</tr>
<tr>
<td><strong>Kale</strong></td>
</tr>
</tbody>
</table>
Products

Gac Fruit  Lucuma  Baobab  Mangosteen  Soursop

Spinach  Kale  Beetroot  Cucumber
Gac fruit (Mamordica cochinchinensis) is grown in Vietnam on vines, and is mainly used for food and medicine in many Southeast Asian countries.
Gac Fruit

- Also known as Baby Jackfruit, Spiny Bitter Gourd, Sweet Gourd, or Cochinchin Gourd

- Typically round or oblong, about 13 cm in length and 10 cm in diameter

- Exterior skin is covered in small spines while its dark red interior consists of clusters of fleshy pulp and seeds

- Grows on vines and is found throughout Southern China, Northeastern Australia, Thailand, Laos, Cambodia and Vietnam

- Has been used as both food and medicine in the regions in which it grows.

Contains: Beta-Carotene (provitamin A), Vitamin E, Lycopene
Gac Fruit

The season for Gac fruit is extremely short and peaks in December and January. The seed pulp of this bright red fruit contains high concentrations of Carotenoids, mainly Lycopene and pro Vitamin A (Beta Carotene).

Nutraceutical Benefits:

B-Carotene (a valuable anti-oxidant)
High levels of Lycopene (more than 70 times the amount found in tomatoes).
Unsaturated Fatty Acids (aids in the absorption of beta-carotene and other fat soluble vitamins).
Gac Fruit

- Health Benefits

1. Anti-Cancer
2. Strong anti-oxidation
3. Prevents LDL from oxidizing
4. Protects skin from ultraviolet radiation
5. Lower the consistency of plasma cholesterol
Kale

• Varieties include Curly leaved, Plain-leaved, Rape kale, Leaf and spear, Tuscan Kale, Lacinato, Dinosaur Kale

• Has green or purple leaves, in which the central leaves do not form a head

• Usually raised from seeds and is found throughout Europe, Asia, Africa, North and South America
Kale

- Low in calories - 36, high in fiber - 5, no fat!
- High in iron, calcium, and vitamin A, C, & K
- Carotenoids and Flavonoids
- Omega-3, fiber, and sulfur...anti-inflammatory, detoxifying, lower cholesterol
Lucuma
Lucuma

- Also known as "eggfruit". Tree blooms all year...ripen further after picked.

- Round or oval fruits are green, with a bright yellow, dry flesh, similar to that of a hard-boiled egg yolk...pumpkin with nutmeg!

- Grows in subtropical climates of Peru, Chile, Bolivia, Costa Rica, and Vietnam

- Has been researched for its wound and skin-healing properties

- Carotene, Vitamin B3, Other B Vitamins
Cucumber

- From *Cucumis sativus* same family as the watermelon and cantaloupe!
- Creeping vine bearing cylindrical fruit that are edible when ripe
- Originally from Southern Asia, but now grows on most continents - 84 billion lbs. a year produced globally
- Typically greater than 90% water, offering hydrating properties...also low calories
- Vitamin A, B1, B6, C & D, Folate, Calcium, Magnesium, and Potassium
Baobab

- has been given the nickname 'King of Superfruits' 
- baobab fruit pod is a hard casing about 1/4 inch thick and extremely hard, measuring about 6 to 8” or 15 to 20 cm long
- Grows in Africa
- high pectin content (around 25%) offers the benefit of being a natural thickening and binding agent
- commonly used to treat fevers, malaria, gastric problems, and vitamin C deficiency among other ailments
- Calcium, anti-oxidants, potassium, vitamin C
Beetroot

- Most commonly encountered in North and Central America, and Europe...first beet sugar factory built in Poland - 19th century
- US, Russia, France, Poland are leading producers today
- Root vegetable with dark, purple skin and pink/purple flesh (close relative of spinach and chard)
- Significant source of folate and a appreciable amounts of manganese, fiber, potassium, Vitamin C
Mangosteen

*Scientific name:* *Garcinia mangostana*

Mangosteen is commonly known as "The Queen of fruits" in parts of Southeast Asia.

Mangosteen fruit consists of a deep purplish rind, a succulent white pulp (four to eight segments), and between one and five seeds.

Mangosteen fruit rind, while typically bitter, contains xanthones and other compounds that demonstrate impressive health benefits.

The pulp, on the other hand, is pure taste-bud bliss.

The number of stigmas on the mangosteen fruit tells how many segments of edible flesh are present inside.
Mangosteen

- Mangosteen cultivation is currently limited to Malaysia, Indonesia, Thailand, Vietnam, India and the Philippines.

  • Young trees do not produce fruit generally until 10 years of age.
  • The trees need humid, tropical environments to thrive and produce fruit.
  • The mature tree reaches a height anywhere between 10 and 25 meters.
  • The fruit gets harvested from a mature tree twice a year. Mature trees can yield anywhere from 400 – 900 fruits.
Health benefits of Mangosteen

The mangosteen has a distinct flavor that many describe as a mixture of strawberry, peach and vanilla.

The outer shell contains insect-repelling substances which discourage insect infestation.

The plants have antiviral, antibacterial and antifungal qualities to protect themselves.

40 known xanthones.

Also contains polyphenols, potassium, calcium and B complex vitamins.
Spinach

- oval to triangular-shaped leaves, variable in size from about 2–30 cm long and 1–15 cm broad, with larger leaves at the base
- native to central and southwestern Asia, but is now grown in Africa, Europe, Australia, as well as North and South America.
- Is a rich source of vitamin A, vitamin C, vitamin E, vitamin K, lutein, magnesium, manganese, folate, betaine, iron, vitamin B2, calcium, potassium, vitamin B6, folic acid, copper, protein, phosphorus, zinc, niacin, selenium and omega-3 fatty acids
Spinach - Other Info

- Thought to have originated in Persia (Iran)
- Brought to Europe in 11th century and known as “the Spanish vegetable” in England
- US and Netherlands are the largest commercial producers
- Over 1000% DV for Vitamin K and almost 400% DV for Vitamin A - cooked
Soursop
Soursop

• Also known as guanabana or graviola

• Typically 20–30 cm long, prickly, green fruit, which can weigh up to 15 lb

• flesh of the fruit includes an edible, white pulp, some fiber, and indigestible, black seeds

• native to Central America & South America, the Caribbean, some parts of Africa, Southeast Asia and the Pacific

• contains significant amounts of vitamin C, vitamin B1 and vitamin B2
Final Thoughts!!!
New Trends in Processed Fruit and Vegetable Products

THANK YOU!

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