Alternative Sweeteners

US Industry Study with Forecasts for 2013 & 2018

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#### INDUSTRY STRUCTURE

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Applications other than diet soft drinks will offer opportunities for growth as food processors and consumers seek healthier food options with fewer calories or less high fructose corn syrup.

US demand to increase 3.4% yearly through 2013

US demand for alternative sweeteners is projected to increase 3.4 percent annually to more than $1.3 billion in 2013. This unremarkable growth forecast taken alone masks a number of diverse, sometimes conflicting, trends in what has become a dynamic industry, enlivened by new products and responses to evolving consumer preferences (which at the moment favor natural, less processed ingredients). While growth in diet soft drinks, historically the largest outlet for alternative sweeteners, will be almost nonexistent, other applications will offer opportunities for growth as food processors and consumers seek healthier food options with fewer calories or less high fructose corn syrup.

High intensity sweeteners to remain largest type

High intensity sweeteners, despite the drag of a declining soft drink market, will remain the largest product category among alternative sweeteners. This leadership position is rooted in their domination of the large diet soft drink and tabletop sweetener markets. Aspartame will remain the leader in diet soft drinks, despite relentless scrutiny about its safety and competition from newer products. All of the top ten diet soft drink brands use aspartame, either alone or in conjunction with other high intensity sweeteners. The tabletop market will continue to be led by sucralose, largely due to Tate & Lyle’s SPLENDA, which skyrocketed from new product to market leader in only a few years. Growth in other markets -- such as dairy products and “New Age” beverages -- will be substantial, although high intensity sweeteners are used in much lower quantities outside of their two mainstay applications.

Newer sweeteners to register sharpest growth

Though expected to remain a fairly small share of the overall market, newer alternative sweeteners will register the sharpest growth and generate the most buzz among food and beverage processors, as well as among consumers. Recently, the most buzzworthy new product has been reb-A, an extract of the stevia plant. Rollouts of the first reb-A tabletop sweeteners following FDA approval were covered by national news organizations as well as the trade press, and high profile introductions of products with reb-A, such as juice beverages, fruit drinks, flavored waters and soft drinks, have followed.

Nevertheless, conventional sweeteners - - sucrose and corn sweeteners -- will continue to dominate the overall sweetener market in the US. Despite the best efforts of producers, no alternative sweetener is fully competitive with sugar in terms of cost, functionality and taste.
MARKETS

Alternative Sweetener Demand

Demand for alternative sweeteners in personal care products is projected to increase 2.2 percent annually to $171 million in 2013. Unlike many food and beverage applications, personal care products are a fairly finite, well defined outlet for alternative sweeteners. Although there is some shift in terms of product mix, there is little room for growth resulting from increased production of the products which presently include sorbitol and saccharin. Although there is some competition from sugar and other conventional sweeteners, whose use in toothpaste and other oral care products would be ill-advised.

Traditionally, the dominant sweeteners in toothpaste and mouth rinses have been sorbitol and saccharin. Sorbitol is inexpensive, multifunctional and has a pleasant sweet taste that imitates sugar fairly closely. Moreover, sorbitol’s cooling quality enhances the mint flavors commonly used in oral care products. In toothpastes, gels and creams, sorbitol offers moisture stabilization, gelling properties and emolliency. Sorbitol gained popularity in oral care products due to its natural image and low cost. Saccharin is also inexpensive, and is so sweet that a very small amount can be used in toothpaste formulations. Although saccharin does not compare favorably with other sweeteners in many applications due to its aftertaste, its flavor profile is of less concern in oral care products, where such sweeteners are meant to make a product’s taste tolerable – a much lower standard than for most food and beverage products.

However, a number of competitors are beginning to establish a presence in oral care products. Other polyols are increasing their share of the market. Among these, xylitol is expected to register the fastest growth. Xylitol helps to kill some of the bacteria that cause cavities, making it a more attractive option than other polyols. Moreover, it is lower in calories than some of the other polyols, and imparts the cooling sensation similar to sorbitol. TOM’S OF MAINE toothpastes and mouthwashes

TABLE V-20

PERSONAL CARE PRODUCT MARKET FOR ALTERNATIVE SWEETENERS BY TYPE

<table>
<thead>
<tr>
<th>Item</th>
<th>1998</th>
<th>2003</th>
<th>2008</th>
<th>2013</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral Care Product Shipments</td>
<td>1980</td>
<td>2850</td>
<td>3310</td>
<td>4100</td>
<td>5090</td>
</tr>
<tr>
<td>$ sweetener/000$ oral care shpts</td>
<td>44.4</td>
<td>37.2</td>
<td>46.2</td>
<td>41.7</td>
<td>38.3</td>
</tr>
<tr>
<td>Alternative Sweetener Demand</td>
<td>88</td>
<td>106</td>
<td>153</td>
<td>171</td>
<td>195</td>
</tr>
<tr>
<td>Polyols:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sorbitol</td>
<td>66</td>
<td>73</td>
<td>88</td>
<td>99</td>
<td>106</td>
</tr>
<tr>
<td>Mannitol</td>
<td>14</td>
<td>19</td>
<td>29</td>
<td>39</td>
<td>49</td>
</tr>
<tr>
<td>Other</td>
<td>4</td>
<td>9</td>
<td>14</td>
<td>19</td>
<td>26</td>
</tr>
<tr>
<td>High Intensity:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Saccharin</td>
<td>4</td>
<td>5</td>
<td>22</td>
<td>13</td>
<td>12</td>
</tr>
<tr>
<td>Other</td>
<td>--</td>
<td>--</td>
<td>neg</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>% personal care</td>
<td>11.9</td>
<td>12.5</td>
<td>13.4</td>
<td>12.7</td>
<td>12.2</td>
</tr>
<tr>
<td>Alternative Sweetener Demand</td>
<td>741</td>
<td>848</td>
<td>1140</td>
<td>1345</td>
<td>1600</td>
</tr>
</tbody>
</table>

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Sample Profile, Table & Forecast

TABLE IV-9
SORBITOL DEMAND BY MARKET
(million dollars)

<table>
<thead>
<tr>
<th>Item</th>
<th>1998</th>
<th>2003</th>
<th>2008</th>
<th>2013</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resident Population (mil)</td>
<td>275.9</td>
<td>290.2</td>
<td>304.1</td>
<td>319.2</td>
<td>334.8</td>
</tr>
<tr>
<td>lb sorbitol/person</td>
<td>1.94</td>
<td>1.91</td>
<td>1.79</td>
<td>1.79</td>
<td>1.78</td>
</tr>
<tr>
<td>Total Sorbitol Demand</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% sweetener</td>
<td>74.8</td>
<td>74.8</td>
<td>75.2</td>
<td>75.4</td>
<td>76.5</td>
</tr>
<tr>
<td>Sorbitol Demand (mil lb)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$/lb</td>
<td>0.40</td>
<td>0.46</td>
<td>0.56</td>
<td>0.58</td>
<td>0.61</td>
</tr>
<tr>
<td>Sorbitol Demand</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Food:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Candy &amp; Confection</td>
<td>74</td>
<td>93</td>
<td>111</td>
<td>119</td>
<td>137</td>
</tr>
<tr>
<td>Dairy Products</td>
<td>62</td>
<td>74</td>
<td>80</td>
<td>79</td>
<td>83</td>
</tr>
<tr>
<td>Other</td>
<td>9</td>
<td>15</td>
<td>27</td>
<td>35</td>
<td>49</td>
</tr>
<tr>
<td>Personal Care Products</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Pharmaceuticals</td>
<td>66</td>
<td>73</td>
<td>88</td>
<td>99</td>
<td>106</td>
</tr>
<tr>
<td>% sorbitol</td>
<td>63.9</td>
<td>60.3</td>
<td>53.9</td>
<td>47.4</td>
<td>42.4</td>
</tr>
<tr>
<td>Polyol Demand</td>
<td>252</td>
<td>315</td>
<td>423</td>
<td>527</td>
<td>655</td>
</tr>
</tbody>
</table>

“Demand for polyols in sweetening applications is projected to increase 4.5 percent per year to $527 million in 2013. Volume growth through the same period is expected to be 2.2 percent annually to 581 million pounds. Although growth for sorbitol, the largest type, is expected to be well below the average for polyols, that will be more than offset by healthy advances for second generation polyols such as erythritol and xylitol, as well as some of the smaller-volume polyols.”

--Section IV, pg. 80-1
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