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THE MARKET FOR STEVIA

Market Brief #07

INTRODUCTION

Native to the jungles that overlap the Paraguayan-Argentinian border, stevia (*Stevia gen.*), is a shrub that has been used as a natural sweetener by the indigenous populations for centuries. Its sweetness, which can be as much as 300 times sweeter than sugar, is derived from the *steviol glycoside* compound of its leaves, of which there are 30 different permutations that vary in levels of sweetness and bitterness. Despite its long history of consumption, stevia was not sold commercially until 1971 when Japan began marketing it as an alternative sweetener. In 1995, the U.S. Food and Drug Administration (FDA) approved its use, but only as a dietary supplement, limiting its available product range. In 2008, the FDA expanded its application, sparking the Coca-Cola Company and PepsiCo Inc., among others, to explore its use as a sugar substitute. Mintel, a market research firm, reports that global stevia-based product launches increased 400% from 2008 to 2012. There is little doubt as to the emergence of stevia as a marketable sweetener. Stevia does not have a specific Harmonized System (HS) code, meaning official trade data is not available for this product.



PRODUCTION

Stevia production can be broken down into the three broad categories. The first consists of stevia plant leaf production, which is stevia in its unprocessed form that contains roughly seven to 15 percent *steviol glycoside* by weight. The second is the basic processing of the leaf into a crude extract that contains anywhere from 20 percent to 60 percent *steviol glycoside* by weight. The third form is production of high grade stevia that has been refined to contain at least 95 percent *steviol glycoside*, with this form typically being hundreds of times sweeter than sugar. This last category is primarily the domain of well-financed companies that tend to rely on proprietary refinement processes that produce stevia with a specific *steviol* composition for use in the food and beverage industry. For example, both Coca-Cola and Pepsi-Cola have proprietary *steviol glycoside* compounds that they use in the production of reduced calorie sodas.

China is the largest stevia leaf producer in the world, with production primarily based in the provinces of Jiangsu and Anhui, Shandong, Heilongjiang, and Gansu, with Shandong (eastern China) being the focal point of the country's processing facilities. Shandong Huaxian Stevia Company produces 1,000 MTs of refined stevia per year. Approximately 50 percent of the company's output is sold domestically, while 40 percent is exported to Japan, and the remaining 10 percent sold to Brazil, Taiwan, South Korea, Indonesia, and the US. The company primarily sources stevia leaves from Paraguay, Kenya, and China. Qufu Haigen Stevia Products Co. also based in Shandong, eastern China, sources its leaves domestically and can produce up to 500 MTs of refined stevia. Qufu also supplies the international market place including North America, Asia, Australia, Brazil, Turkey, and Italy. Another company with operations in eastern China is the Canadian-based GLG Life Tech Corp. The company can process and refine up to 41,000 MTs of stevia leaves into 3,000 MTs of high grade stevia. The company primarily sources their leaves from China, and exports to North America, Australia, and Asia.

The Malaysian-based company PureCircle, is the industry leader in stevia production. Headquartered just outside Kuala Lumpur, the company operates a stevia extraction facility (4,000 MTs per year capacity) in China, as well a refinery in Malaysia (2,000 MTs of high grade stevia per year capacity). PureCircle has been working with the Coca-Cola Company since 2012 to develop "high purity" strains of stevia. As of 2013, PureCircle invested more than US\$300 million in stevia and developed the *steviol glycoside* strains such as Rebaudioside M, also known as 'Reb M' or 'Reb X'. Rebaudioside D or 'Reb D', 'Reb A', and 'SG95'. According to PureCircle, Reb A accounted for 90 percent of its sales in 2009, but only 40 percent in 2012, noting that its new strains (e.g. Reb M) were overtaking Reb A, with Reb D only being approved by the FDA in 2013.

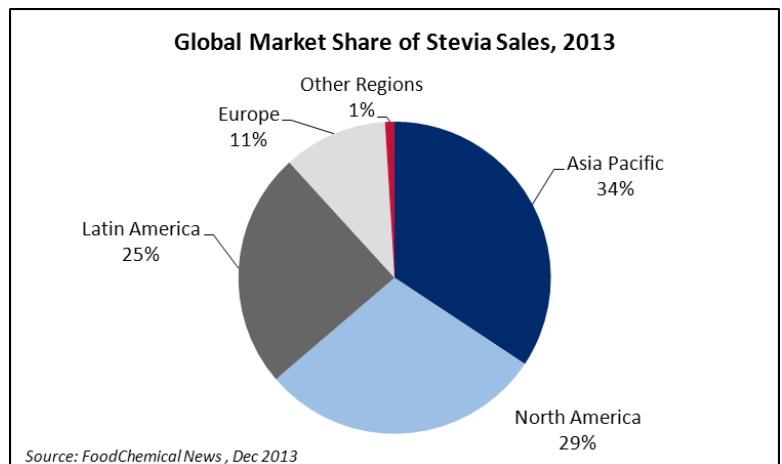
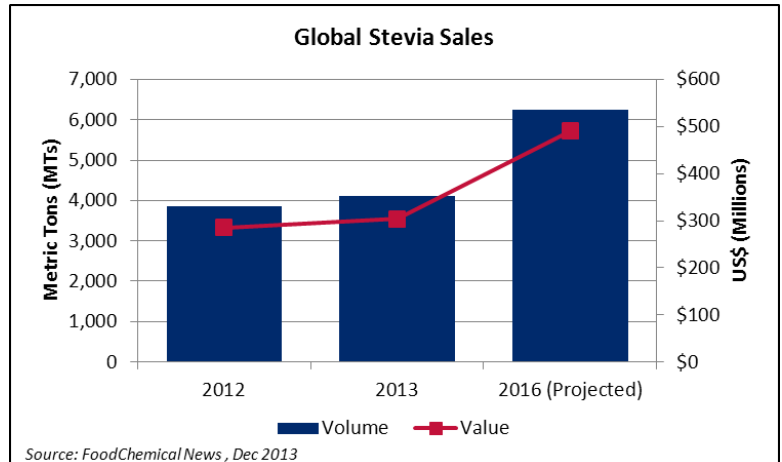
Paraguay is a noted stevia leaf producer and processor, averaging approximately 500 MTs of refined stevia per year. The company NL Stevia S.A. is Paraguay's largest stevia processor and has an output of approximately 100 MTs of refined *steviol glycoside* per year. The company states that 20 percent of production is certified organic. The company sources their leaves domestically.

The **US** is a small producer of stevia leaves, with production primarily taking place in California's Central San Joaquin Valley, Georgia and North Carolina. A large share of US production is shipped to China for extraction and then re-exported back for sale or further processing. Within the US, stevia grows in similar climatic conditions and soil as tobacco, making the crop a decent substitute in years where the tobacco market performs poorly.

MARKETS

According to the US-based Stevia Corp, the global sweetener market averages approximately US\$80 billion annually, with sugar comprising the bulk (~82 percent) of sales. After sugar the largest share of the sweetener market is held by high fructose corn syrup (~9 percent of sales) and other high intensity sweeteners (~9 percent or approximately US\$8 billion), which includes stevia. According to a report from Food Chemical News, between 2012 and 2013, global stevia sales increased from 3,850 MTs to 4,100 MTs (or by six and a half percent), while equivalent values rose from US\$285 million to US\$304 million (also by six and a half percent). According to Zenith International, a UK-based food and drink consultancy, by 2016, sales are expected to reach 6,250 MTs with a value of US\$490 million, which is well above the six and a half percent growth rate seen over the 2012/2013 period. Overall, according to the World Health Organization (WHO) global stevia consumption could eventually replace 20 percent to 30 percent of all dietary sweeteners.

In 2013, the Asian Pacific region was the largest buyer and comprised 34 percent (approximately US\$106.4 million) of global stevia sales. The North American region followed suit with 29 percent (~US\$91.2 million), while Latin America had 25 percent (~US\$76 million) of all sales. Although the smallest regional buyer at just 11 percent (~US\$33.4 million), Europe has perhaps the greatest growth potential of any market. In 2011, Europe only accounted for four percent of all new global product launches containing stevia. By 2012, Europe accounted for 25 percent of all new stevia product launches, surpassing both North America (15 percent of new stevia products) and Latin America (9%). Additionally, Asia's share of new stevia product launches declined from 63 percent to 50 percent from 2011 to 2012. Europe's 2012 product launches were primarily in the non-alcoholic beverage segment (31 percent of all new products), snacks (26 percent of new products), and table-top products (16 percent).



The primary reason behind Europe's emergence is that stevia was finally cleared for consumption in all EU-28 member states in November 2011. During 2012, stevia products were rapidly introduced with roughly 60 percent of new retail food products containing both sugar and stevia, while 40 percent contained only stevia. In 2013, growing pains began to show as American sweetener giant, Merisant (producer of Equal, Canderel, PureVia) removed its stevia-based PureVia product from store shelves in the United Kingdom over poor sales. However, the European market outlook remains optimistic. According to a Mintel report published in 2013, approximately 55 percent of German consumers, 47 percent of British consumers and 45 percent of French consumers stated they would be willing to try products made with alternative sweeteners such as stevia.

Despite recent gains made in Europe, the US remains a top destination market for stevia producers. According to the chairman of PureCircle, the US market accounted for approximately 40 percent of their stevia sales in 2012, with the majority used in the production of carbonated soft drinks (e.g. Coca-Cola). Additionally, in 2012, according to the market research firm Nielsen, approximately 55 million U.S. households purchased stevia products, trailing only Splenda (e.g. sucralose) in the high intensity sweetener market share.

SEASONALITY

On average, stevia leaves are harvested two to four times per year, usually prior to flowering in order to prevent *steviol glycoside* levels from dropping. In China, stevia is generally harvested three times a year in the areas south of the Yangtze River (e.g. southern China), twice along the Yellow River (e.g. central China), and only once in the colder northern regions of the country. Harvests generally occur in June, but vary according to local conditions. In Paraguay, the primary harvest periods are in September and January (combined 75 percent of output), with secondary harvests occurring in April and June. Processors tend to purchase stevia year-round with no discernable high or low trends.

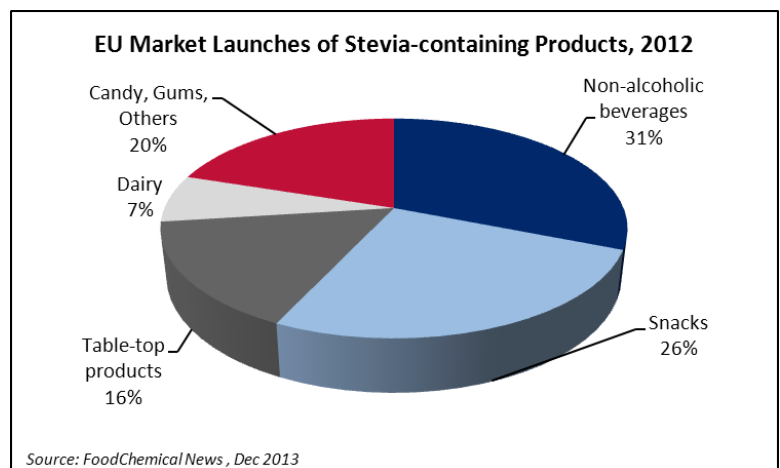
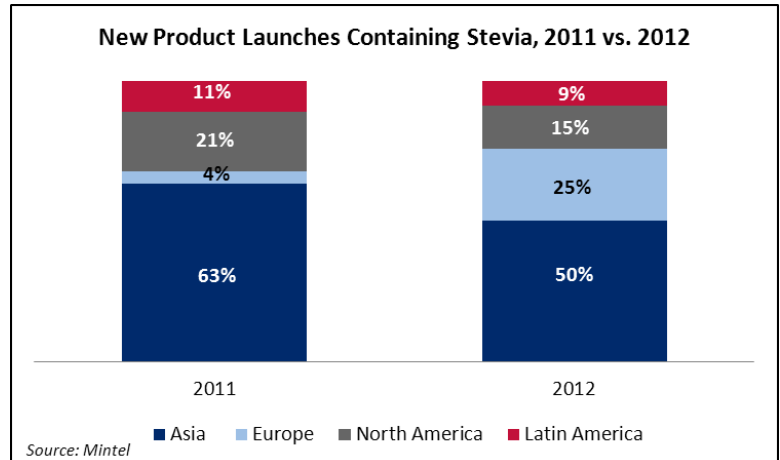
PRICES

Wholesale and retail stevia prices vary widely since it is an emerging crop with a wide range of varieties. In general, stevia is more expensive than artificial sweeteners such as aspartame, saccharin and sucralose. According to African export association, international prices for dried stevia leaves ranges from US\$2.00 to US\$4.00 per kg, while refined stevia (at least 97% *steviol glycoside* by weight) ranges from US\$100 to US\$150 per kg.

STANDARDS, LAWS AND REGULATIONS

Dry stevia leaves are generally packaged in plastic lined cardboard boxes and sealed for further processing. Stevia extract is typically packaged in 20 kg boxes.

In 2008, the Joint FAO/WHO Expert Committee on Food Additives (JECFA¹) approved stevia for the use in food and beverages and established an Acceptable Daily Intake (ADI) of four milligrams per kg. As of 2014, stevia is accepted as a



¹ FAO and JECFA: Steviol Glycosides: <http://www.fao.org/ag/agn/jecfa-additives/specs/monograph5/additive-442-m5.pdf>

natural food ingredient in numerous countries including the USA, Japan, China, South Korea, Brazil, Australia, Russia, and the EU.

OUTLOOK

As an emerging market, there is room for new entrants who can produce quality leaves for use by the processing sector, which is primarily based in East Asia. Although China and Paraguay are the top stevia leaf producers, other countries such as Bolivia, Kenya, and US (e.g. California, Kentucky, and North Carolina) have expanded production in hopes of taking advantage of newly opened markets, particularly the EU. Although the majority of world now allows the sale of stevia as a permissible food ingredient, future demand is difficult to predict due to the experimental and proprietary nature of processed stevia. For instance, in 2010, Mintel expected the stevia market to reach US\$2 billion by the end of 2011 (with US accounting for US\$1 billion), however stevia sales only managed to reach US\$304 million by 2013. Major food and beverage producers are still formulating ways to utilize and integrate stevia into their products. However, it is becoming clearer, owing to stevia's "bitter licorice aftertaste", that it will primarily be used in conjunction with sugar and other additives, as opposed to replacing sugar entirely.

Both PepsiCo and Coca Cola Company have invested heavily in the development of high purity strains of *steviol glycoside* in hopes of producing a standardized ingredient that can be used in the mass production of its carbonated beverages. To make matters difficult, stevia production suffers from a lack of uniformity, with plants having varying sweetness levels and bitterness based on various *steviol glycoside* compounds that are present in each plant. According to industry sources, South America produces the highest quality leaves that have a content percentage of 12 to 13 percent by weight. In China, its leaves typically only have 5 to 6 percent *steviol* by weight. Honduras should strive to produce a uniform product that consistently contains at least 8 to 10 percent *steviol glycosides*. In order to adequately compete and secure a contract with major buyers, producers must demonstrate that they are able to produce a relatively standardized crop on a large scale. Of critical importance for producers is the percentage by weight of *steviol glycosides*. Honduras could be a niche supplier to buyers who export or re-export the leaves (after initial extraction) for processing abroad.

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