



ORGANIC SUGAR – NICHE COMMODITY IN THE MAINSTREAM MARKET

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Demand for organic food is booming globally, but particularly in high-income countries. The sector has rapidly become an important segment of the overall food market and growth is set to continue. Among the factors underpinning demand for organically grown products are concerns about the environment and side effects of the intensive agricultural production systems, health and food safety concerns (publicised problems such as pesticide residues in food, *E.coli*, bovine spongiform encephalopathy, etc.), fundamental ethical objections to the application of new technologies (such as GMO biotechnology) to food production.

The share of organic foods as a segment of the grocery market is increasing, although currently it accounts for only between 2 and 4 per cent of total spending on food in developed countries. There, according to the ITC UNCTAD/WTO, the share of organic food is expected to reach 5 to 10 per cent of total food sales by the year 2005 indicating a large long-term potential [1]. Thus, one may conclude that trade in organic foodstuff has become an important global agribusiness.

World Markets for Organic Food and Beverages

	Approximate retail sales in US\$ mln in 1997	% of total food sales in 1997	Retail sales in US\$ mln in 2000*	Expected growth rate in % over the medium terms (by 2005-2006)*
Germany	1,800	1.2	2,300	10-15
France	720	0.5	750-800	15-20
UK	450	0.4	1,000-1,050	25-30
Netherlands	200	1.0	225-275	10-20
Switzerland	350	2.0	450	15-20
Denmark	250	2.5	375	10-15
Sweden	110	0.6	150	20-25
Italy	750	0.6	1,000-1,050	15-20
Austria	225	2	250-300	10—15
Other Europe	200	n/a	300-400	n/a
Total EUROPE	5,255	n/a	6,800-7,150	n/a
US	4,200	1.25	8,000	15-20
Japan	1,000	n/a	2,500	n/a
WORLD	10,450	n/a	17,300-17,650	n/a

Source: **Organic Food and Beverages: World Supply and Major European Markets. International Trade Centre UNCTAD/WTO, Geneva, 1999.**

* ITC UNCTAD/WTO preliminary figures

Sugar, for the time being, is only a sideline commodity in the fast growing world market of organic products. However, taking into account a rapid expansion of the latter on the one hand, and an overall importance of sugar (particularly in the form of sugar containing products) in the human diet on the other, one may suggest that its niche in the market of organic products will experience a sound growth in future.

Prior to examining demand potential and supply availability of organic sugar it is instructive to summarize what constitutes organic agriculture and organic food produce.

ORGANIC AGRICULTURE AND FOOD PROCESSING – BASIC CONCEPTS

The concept of organic farming is based on a holistic viewpoint. Nature is perceived to be more than just separate individual elements into which it may be split. Contemporary organic farming merges traditional and respectful view of nature with a modern scientific approach to farming practices. According to the Guidelines for the Production, Processing, Labelling and Marketing of Organically Produced Food of the Codex Alimentarius Commission of the Joint FAO/WHO Food Standards Programme [2], "Organic agriculture is a holistic production management system which promotes and enhances agroecosystem health, including biodiversity, biological cycles, and soil biological activity. It emphasizes the use of management practices in preference to the use of off-farm inputs, taking into account that regional conditions require locally adapted systems. This is accomplished by using, where possible, cultural, biological and

mechanical methods, as opposed to using synthetic materials, to fulfil any specific functions within the system”.

Organic agriculture does not apply agro-synthetic pesticides and fertilisers, but a simple non-application of agrochemicals does not render a farm organic. Organic production requires the complete conversion of a farm in accordance with an organic management plan. This includes a balanced, multi-annual crop rotation. Substances “foreign” to the farm should be applied only where essential and strictly according to the restrictive “positive list” as provided for by national regulations on organic agriculture. All material produced from genetically engineered/modified organism (GEO/GMO) are considered as not compatible with the principles of organic production and therefore are not accepted as organic.

The time between the start of organic management and certification of crop as organic is known as the conversion period. At least a two-year conversion period in the case of annual crops (e.g. sugar beet) or a three-year period in the case of perennial crops (e.g. sugar cane) is required before product can be labelled as organic. Simultaneous production of conventional and organic crops, which cannot be clearly distinguished from each other, is not allowed. If unauthorized chemicals are applied (e.g. to fight a weed or pest calamity) the land parcels may be led back into organic holding only after a new conversion period.

Practices and standards for organic agriculture cover all agricultural crops and currently do not establish any specific requirements for sugar beet or sugar cane. The only exception here is the elimination of the practice of cane burning prior to harvest.

Processing and handling of organic raw material should be separated by time or place from processing of non-organic products. Therefore cane crushing or beet slicing can be carried out not only by industrial units specialised in organic sugar production but also by existing mills/factories before conventional crops start to be processed or after crushing/slicing of conventional crops has been completed.

There are no special technological requirements for organic sugar manufacturing apart from restrictions imposed by the positive list of processing aids and other non-agricultural ingredients allowed in organic production. In sugar production processors are allowed to use sodium carbohydrate, sodium hydroxides and sulphuric acid. Lime can be used to clarify cane/beet juice. Other clarifying agents such as flocculants containing polymers are not allowed. Suiker Unie, the first Dutch company to produce organic beet sugar, reported that the commonly used antifoaming agents had to be replaced with a specially developed vegetable agent [3].

So far at least one hundred national, regional or industry standards have been developed around the globe. At present there are two international standards: the IFOAM¹ Basic Standards and Codex Alimentarius Commission (a common

¹ IFOAM - International Federation of Organic Agriculture Movement. IFOAM was established in 1972. It represents the worldwide movement of organic agriculture with over 740 member organisations in more than 100 countries and provides a platform for global exchange and co-

programme of the two UN organizations – FAO and WHO) Guidelines for Organic Products. These, in their turn, constitute instruction manuals for designing national regulations rather than binding standards applicable worldwide. As a result, an export-orientated producer has to make sure that its organic product designated for export has been grown, processed, packed and labelled in full conformity with the particular regulations in the country or countries of destination as well as the domestic requirements.

The rapid growth of the market for organic products (where prices are substantially higher than those for conventionally produced foodstuff), on the one hand, and existence of legally binding regulations, on the other hand, necessitate a system of certification to verify that a product labelled as organic conforms to a certain set of standards. Certification of organic products is basically the certification of a production system rather than of the individual product.

Certification procedure should make it possible to track and control the flow of products from primary production at farm level through each stage of manufacturing right up to the final consumer product. Certification is not a one-time procedure. It is carried out continuously on the basis of ongoing monitoring and inspection. For example, the EU Regulation requires that, apart from unannounced inspection visits, the inspection body must make a full physical inspection, at least once a year, of the site [4]. The cost of certification can be rather high. Participants of the CFC/ISO Symposium in Guatemala (August 2000) suggested a range between US\$5,000 and US\$50,000 depending on the number of growers seeking certification, production volumes and the markets to which the certified sugar would be exported [5].

SUPPLY AVAILABILITY – A SOUND GROWTH OF PRODUCTION IN THE 1990S

Currently there are neither national nor international statistics on production, consumption and trade in organic products. The number of countries with reported production of organic sugar is rather limited. Some producers offer organic sugar cane, sugar cane molasses and syrup but not sugar. Below is some information on organic sugar production presented on a country-by-country basis.

In *Africa* production of organic sugar cane, sugar cane molasses and syrup has been recorded in Madagascar and Malawi, while Mauritius started commercial organic sugar production from cane harvested over 175 hectares in 1995. That year 650 tonnes were exported. Since then the area has been reduced and production halved due to the prohibitively high cost of production. Sugar has been certified by a British certifier and has been exported mainly to the EU.

In *Asia* only Philippines has reported production of organic sugar. Sugar produced on the island of Negros is sold under fair trade schemes. Annual production and exports reach 400 tonnes. Sugar is exported to Japan and Western Europe. Organic sugar cane is also grown in India. In May 2000 there

operation. By the expertise of its members IFOAM opens the way for implementation of above aims in everyday life.

was a report on plans to start organic sugar production in the state of Karnataka on 50 per cent of the state's area under cane. Also some major cane growing states like Maharashtra and Tamil Nadu have already switched to the production of organic sugar cane, but production remains unreported [6].

In *South America* sugar from organically grown cane is produced in Argentina, Bolivia, Brazil, Colombia and Paraguay. In Argentina production of certified organic sugar started in the province of Misiones in 1998 with 70 per cent of produced sugar exported to the US. Organic sugar producers are supported by PRONAO, the National Programme of Organic Agriculture developed by the Ministry of Agriculture [7]. Production of organic sugar is also monitored in Colombia by Agroindustrial Hunzahua Ltda in Cundinamarca and Ingenio Providencia S.A.. The latter started organic production in 1999 when the first 383 tonnes of sugar were made. In 2000 the output increased to 434 tonnes. The company plans to convert 30 per cent of the area owned by the mill (approximately 1,500 hectares) to organic production in order to increase the organic sugar output to 15,000 tonnes a year [8]. In Paraguay since 1994 Otisa mill in Asuncion has been dedicated totally to organic production, exporting organic sugar predominantly to the USA [9]. Currently the mill's annual capacity reaches 8 thousand tonnes of organic sugar and 900 thousand litres of organic alcohol [10]. At the end of the 1990s organic sugar production in Paraguay was also started in Azucarera Iturbe S.A. [11].

Brazil, the largest world sugar producer and exporter, recently has captured the leading position in the organic sugar market as well. Organic sugar is produced under the brand name *Native* by Organizacao Balbo's Sao Francisco and Santo Antonio mills based in Sao Paulo state. *Native* sugar was launched on the international market in 1997, when the first 1,600 tonnes of organic sugar came off the conveyor belts. The next year, production rose to 4,000 tonnes and then rocketed to 23,000 tonnes in 1999 (12 thousand tonnes were designated for export while the remaining 11 thousand tonnes entered the internal market). The company targeted to raise production to 40 thousand tonnes in 2000/01 and export 20,000 to 24,000 thousand tonnes to 21 countries including EU, US, Canada, Mexico, Japan, New Zealand and Tunisia. The company's goal is to increase production to 60 thousand tonnes by 2007, by that time all the sugar processed by the company's two mills will be from organic cane [12]. There are other smaller organic cane sugar processors including Produtos Naturias Planeta Verde Ltda in Lucelia (Sao Paulo), one of the oldest organic sugar producers and exporters in the world.

In *Central America* organic sugar is manufactured in Costa Rica and The Dominican Republic. In Costa Rica annual production of organic sugar reaches about 1.2 thousand tonnes (Assukkar S.A. sugar mill) with sugar exported mainly to the US and the Netherlands [13]. In the Dominican Republic there is one processor of organic sugar cane – Procesadora de Cana Organica Cruz Verde with an estimated production of 400 tonnes a year. There are reports indicating that Cuba also has well developed plans to convert one mill and estate to exclusively organic sugar production [14].

In the United States the leading producer and distributor of organic sugar is Florida Crystals, Florida. Organic cane is cultivated on about 2 thousand hectares in rotation with rice and pisciculture. According to the company's

officials, the organic cane sugar output varies from 1,000 to 1,500 short tones a year. There is no organic beet sugar production in the US but Wholesale Foods, a subsidiary of Imperial Sugar Company, reported that they were working closely with their agricultural and processing teams and organic certifiers to start a sugar beet programme aimed at production of organic sugar and beet pulp (an important by product for organic livestock feed) [15].

In *Europe* sugar production from organically grown beet is still embryonic with small production started by Danisco in Denmark and Suiker Unie in the Netherlands in 1999/2000 (the total output of 400 and 1000 tonnes, respectively [16]). In December 2000 British Sugar Plc., the only beet sugar processor in the UK, announced a launch of a liquid organic sugar. While the company is currently importing all supplies for the new product, it plans to supplement supply with organic sugar produced from domestically grown beet from 2001. In the forthcoming harvest British Sugar targets to receive 10,000 tonnes of organically grown beet from around 300 hectares. According to the company, British growers are showing interest in growing organic sugar beet. However, no major increases in beet supply can be expected before 2003 due to the two-year conversion period. [17]. British Sugar also envisages added value opportunities for organic beet growing from its sister companies dealing with animal feeds within Associated British Foods Plc. Other companies within the group are involved in cereal and pork production, thereby forming the basis of an entire organic rotation [18].

From the producers' perspective obstacles to conversion to organic production include large managerial costs, risks of shifting to a new way of farming, limited awareness of the organic farming system and lack of marketing and technical infrastructure. In the case of sugar, there is an added difficulty - the introduction of crop rotation system into agroindustrial sugar crop production, which in many cases still follows a monoculture system. Producers cannot command certified organic price premium during two to three year conversion period.

The decision for any producer to undertake organic sugar production involves a serious cost-benefit calculation. On the benefit side, we have reduced input costs due to avoidance of synthetic yield enhancing inputs² and a considerable organic premium. In Europe growers may expect prices 50 to 55 per cent higher than those for conventional beet. According to the industry, sugar produced from organically grown cane is estimated to command about 1.5-2.5 times the ex-factory price of its non-organic counterpart. It has to be noted that the organic premiums will apply to all farm's and factory's output rather than beet, cane or sugar only. In the Netherlands, for example, Suiker Unie supplies organic molasses to Nedalco, where it is used in production of organic drinks and vinegar. The pressed pulp is sold to organic cattle farms [19].

At the first stage of conversion to organic agriculture non-application of agrochemicals severely decreases sugar and overall agricultural yields. According to a recent UK study, output of sugar beet grown in an organic system could be about 60 per cent lower than that from conventional fields [20]. Suiker Unie, the first Dutch organic sugar producer, reports that since the

² According to Landell Mills, in the case of high yield beet and cane sugar producers, agrochemicals are responsible for 6 to 16 per cent of sugar crops' production cost.

company introduced the pre-production scheme (i.e. processing organic beet in an existing factory before the conventional crops arrive) overall lower beet yields have been observed, plus organic beet now has to be harvested earlier before maximum sugar content is attained.

In the case of cane sugar production, Mauritius Sugar Syndicate notes that organic cane yields are markedly below those of conventionally grown cane with an average 20 per cent drop in yields. Similar to beet sugar processing there are further reductions in sugar extraction during processing because of sugar loss at the first strike. Their experience shows that organic sugar yields are about half the yields of sugar obtained from conventional cane.

The organic farming movement argues that in the long run the adoption of proper organic methods (good crop rotation, use of better plant varieties, developments in agricultural techniques and technology, etc.) might greatly compensate for the initial losses in yields. Higher production volumes permitting a longer use of a processing unit for organic beet or cane processing should eliminate sugar losses due to lower extraction rates at the first strike and permit harvesting at the optimum time. According to Brazilian producers of organic sugar, the productivity of Sao Francisco's plantation already exceeds that in the traditional growing regions of the Sao Paulo state [21].

Despite high costs and risks involved into conversion to organic production, world output of organic sugar shows a remarkable expansion from couple of thousand tonnes in the mid-1990s to 40,000 tonnes to 50,000 tonnes last year [22].

DEMAND POTENTIAL RESTRAINED BY LIMITED SUPPLY

The world use of organic products is dominated by Western Europe, the United States and Japan, although there are fast growing markets in a number of developing countries as well (e.g. Brazil). In high income countries the organic sector is moving from "alternative" culture to the mainstream supermarket option. The organic market started as the direct deliveries of organic food by farmers to consumers. It covered vegetables and fruits, meat, poultry and dairy products. Obviously, sugar as an industrial produce could not be offered directly by growers. On the health food market sugar also faces a competition from honey, a natural sweetener with a rather developed organic production worldwide. Another factor explaining a slow progress in demand for organic sugar is the "unhealthy" image of sugar in general, which makes it less appealing to health-conscious consumers. Nevertheless, demand for organic sugar has shown a remarkable growth in recent years.

Since the second half of the 1990s the mainstream supermarket sector has committed itself to supporting organic trade, which now includes a large variety of processed foods and beverages on top of the traditional choice of organic farm products. Sugar, as an important and, sometimes, irreplaceable ingredient in production of ice creams, jams, breads and confectionery, is starting to enjoy a fast growth in demand. It remains to be seen, however, whether demand for organic sugar will grow on a par with organic market in general. One can assume that "traditional" organic products, i.e. direct farm produce, will be mainly responsible for the projected growth of organic products to the level of 5

to 10 per cent of the total food sales in the advanced economies by 2005. The level of market penetration by processed food might be much lower but still impressive. It has been suggested that by 2005-2006 world demand for organic sugar can be projected at 190 thousand tonnes, raw value (based on the assumption that the share of processed organic food reaches 1 per cent of the total processed food sales in developed countries) [23, 24,25]. Clearly, even a fourfold increase to a 190 thousand tonne level will leave the organic sugar market responsible for only a minute section of the world sugar market representing less than 0.2 per cent of world consumption.

In the short to medium terms the main problem for organic sugar market will be insufficient supply rather than lack of demand. Hence, considerable premiums for organic sugar can be anticipated. Organic sugar premiums at about two times the ex-factory price of its non-organic counterpart open up opportunities for producers and exporters. Although the overall picture looks highly positive, in evaluating business opportunities one should take into consideration a number of potential risk factors. including a danger of premium erosion as supplies develop.

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