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CULTIVATED BERRY VALUE CHAIN ASSESSMENT

USAID AGRIBUSINESS PROJECT

SERBIA

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EXECUTIVE SUMMARY

The Serbian cultivated berry sector, especially raspberries and blackberries, has been a rare source of steady incomes for growers and for the processing industry, and thus a driving force in agricultural economic growth for two decades. More than 80,000 farms, 250 cold stores, and 100 processing factories are involved in the sector. Raspberries and blackberries are one of the top export commodities (ranked third, right after grains and sugar), while strawberry production is an important subsector for the processing industry.

The majority of the berries grown in Serbia are varieties suitable for processing, grown in open fields using outdated technologies and with relatively low yields (see Appendix). Serbia is one of the biggest producers of raspberries and blackberries in the world. Strawberry production is small but growing, with newer plantings replacing the old field varieties that predominate in the subsector; nonetheless, Serbia's average strawberry crop yields are still 10 times lower than those of most competing countries. Cultivated blueberries, as well as black and red currants, are still grown in negligible quantities, with potential for growth. There is interest in starting up commercial levels of production of cultivated cranberries, but so far, few investments have been made in the bog marshes of Northern Serbia near Hungary, where cranberries are grown commercially. Thus, most blueberries and cranberries on the Serbian market are wild-picked berries, rather than cultivated ones.

More than 200 of the 250 cold stores are small, with less than 2,000 tons of capacity; most have outdated technology, few quality standards, and little knowledge of modern marketing practices. In the past few years, a dozen more modern cold stores have appeared. With capacities exceeding 2,000 tons, these have the standards and marketing knowledge required to emerge as a driving force for the sector. They have developed a professional business code and shifted exports of berries from pre-cooled (the lowest quality, cooled and shipped in bulk in tankers) and bulk-frozen into value-added frozen retail packs.

Up to now, Serbia has been an exporter of fruit ready for processing, leaving it for other countries to add the value. That must change. However, Serbia still has too few fruit-processing factories to capture this value-added business. Some of the large state-owned factories are still not privatized or not operational (Budimka, Dzervin, and Godomin), while newer or renovated factories (Srbijanka, Delises, Vino Zupa, Podgorina, and Rauch) are unable to absorb enough fruit. However, more modern plants have emerged in the last five years, with examples including Nektar, which produces concentrates and juices; Agranela, which produces conventional dried products; Van Drunen, a U.S.-owned foreign direct investment (FDI) company producing freeze-dried products; and Foodland, which produces preserves.

Berry product sales are estimated at \$172 million for 2006, with overall exports of these products at \$151 million (all dollar amounts are in U.S. dollars). The largest portion of these exports—\$101 million—comes from processed frozen raspberries, followed by \$30 million from processed frozen blackberries and \$20 million from berry juices and concentrates. In addition, the local market absorbed approximately \$21 million worth of berry products, broken down into \$10 million in fresh berries, \$10 million in juices, and \$1 million in frozen retail berries.

The berry value chain can be subdivided into processing and fresh products for each type of berry. Cultivated blueberries are a fairly new product in Serbia, with a relatively small but growing harvest that is only sold locally—and only on the fresh market, where it can draw higher prices.

The processing value chain may be further split among pre-cooled, frozen bulk, and frozen retail products. The pre-cooled value chain for raspberries and blackberries offers the lowest value, and its value has declined further as more berries are being processed in Serbia and sold as frozen bulk product and frozen retail packs. The majority of pre-cooled berry exports are raspberries, with pre-cooled blackberries primarily sold to local processors. The share of pre-cooled strawberries sold for processing in Serbia amounts to 87 percent of total production, and it mainly goes to domestic market. Less than 1 percent of Serbia’s strawberry production is exported as pre-cooled; 76 percent of this category goes to the Russian Federation.

The bulk frozen value chain has far and away the largest share among all value chains for raspberries and blackberries (70 percent and 50 percent respectively), while only 3 percent of strawberries go into bulk freezing. Serbia has been very successful in capturing a large share of the bulk frozen export markets for these two types of berries, accounting for one-third of the world’s total exports of frozen raspberries. About 97 percent of Serbia’s exports go to the European Union (EU), accounting for 65 percent of total EU imports. The price-based competitiveness of Serbian frozen raspberries on the EU market is result of Serbia’s proximity (low transportation costs) as well as low labor costs compared with Serbia’s main competitors in Europe (Poland and Hungary). However, the anticipated growth of average wages in Serbia in coming years will put pressure on growers and processors to improve yields and productivity, and thus decrease production costs.

Serbia’s frozen retail pack value chain is growing. It is a new business for Serbian companies—one that did not even exist a few years ago—and it is a great example of how the process of adding value can be “moved back home.” Companies are exporting their frozen retail pack through foreign traders (importers) and directly to foreign supermarkets, while local supermarkets absorb 5 percent of output on average.

Fresh berries, sold only in the local “green markets” (farmers’ markets for fresh produce) or supermarkets, are still insignificant in volume, but that is beginning to change. Quantities are increasing by 30 percent annually on average, providing Serbian farmers from \$1.30 to \$3.00/kg—a 50 percent to 300 percent price increase over conventional bulk frozen product.

PROJECT STRATEGY

The opportunities for the Serbian berry sector are to be found in these domains:

- The fresh market.
- The frozen retail market.
- Value-added products (juices, purees, extracts).
- The organic market.

Market opportunities for fresh berries appear superior to those for frozen berries. Growers are typically paid 30–50 percent more for fresh berries picked directly into small plastic punnets (small baskets for

fruit), while export prices are 200 percent to as high as 400 percent above those for bulk frozen whole fruit. The competition is much lower in the fresh than in the frozen retail business. Chile, being too far away from Europe, cannot compete while Poland is not much active in the fresh berry business. Serbia does however have to compete with domestic EU producers such as the UK, Spain, and France, but with seasonal prices ranging from \$6.50 to \$12.00/kg, the opportunity for Serbian exporters is quite bright. Farmers should use new varieties, with an extended season and new characteristics suitable for the fresh fruit market such as big fruits, light color, and a shelf life of at least 10 days.

Serbia should move away from exporting pre-cooled product (Serbian processors should process it instead) and bulk products; raspberries, in particular, should be packed in retail packs and sold for 30 percent more on average. Given that average costs of production for raspberries, including harvesting, range from \$0.75/kg to \$0.90/kg, and assuming that packaging, transportation and marketing costs would not exceed \$1.50/kg, there is still room for achieving quite high margins and profitability. New and existing value-added products, like berry powder, freeze-dried berries, conventional dried berries, fruit purees, concentrates, and juices should be developed and further promoted.

Organic markets, with a margin 20–40 percent higher than for conventional products, are growing rapidly.¹ Serbian producers should shift part of their production into organic production.

¹ "The World of Organic Agriculture: Statistics and Emerging Trends 2008," a study recently published by FiBL (Forschungsinstitut für Biologischen Landbau, or the German Research Institute for Organic Agriculture), shows that the global market for organic products reached a value of \$38.6 billion in 2006, according to *Organic Monitor*. This constitutes a growth of \$5 billion over 2005.

1. INTRODUCTION TO THE SUBSECTOR

REASONS FOR SELECTING THIS SUBSECTOR

- Berries have been one of Serbia's main export products for years; the country's chief berry export is frozen bulk raspberries. There is a large potential for shifting from frozen bulk exports into exports of fresh fruit, frozen retail packs, and value-added products such as dried berries (air- and freeze-dried),² berry-based culinary ingredients (powders, extracts, etc.), concentrates and purees, organic products, and other retail products.
- A large number of people are employed in the sector, with more than 80,000 farms involved in production.
- The production of blackberries and raspberries is sufficient, but production of blueberries (with only 20 ha under cultivation) and red-black currants (30-40 ha) is almost nonexistent. Thanks to solid demand at home and abroad, production of blueberries and currants can be further increased in Serbia.
- Organic production of berries is well established and growing in Serbia, but insufficient in quantity. According to interviews conducted, the country has no more than 10 small and medium-sized enterprises (SMEs) certified for production and export of organic berries (frozen and/or pre-cooled) to various markets in the world. It is expected that an additional five to six firms will successfully complete the conversion from conventional to organic production within next two years. With growing demand in the world market for organic berries, berry ingredients, and berry products, local production should be further boosted.
- There is increasing local demand for processable raspberries, blackberries, strawberries, blueberries, and currants for juices and preserves.

BOUNDARIES OF THE SUBSECTOR

This value chain analysis included the following components:

- Domestic production
- Domestic trade
- Domestic market
- Other international trade and competitive analysis

² Freeze-drying (also known as lyophilization) is a dehydration process typically used to preserve a perishable material or make the material more convenient for transport. Freeze-drying works by freezing the material and then reducing the surrounding pressure and adding enough heat to allow the frozen water in the material to sublime directly from the solid phase to gas.

2. THE MARKETS

THE DOMESTIC MARKET

RASPBERRIES

(Please see [Figure A1, Volumes of Raspberries Used Locally](#), in the Appendix.)

Less than 10 percent of Serbia's total raspberry production stays in the country. Local processors use only 4,000 tons of raspberries, which are processed into juices, concentrates, and preserves. There is also one foreign company, Van Drunen Farms, which is freeze-drying (lyophilizing) Serbian berries.

A few years ago, fresh Serbian raspberries could be bought in Serbia only in bulk on the green markets, but now more farmers and traders are selling it packed in small 250g and 500g punnets (small baskets for fruit) at green markets and to supermarkets at higher prices. Older varieties may be sold for fresh consumption on the local market, as the shelf life does not have to be as long as for sale in foreign markets, and local consumers do not differentiate between different varieties. However, the season can be successfully extended with new varieties and growing technologies, and farmers who take advantage of these possibilities could earn a much higher price in spring or autumn than in June–July. Green market sales of fresh raspberries increased 30 percent in 2006 compared to 2005, rising from 420 tons to 560 tons and providing Serbian farmers with from \$1.30 to \$3.00/kg—a 54 percent to 400 percent price increase over conventional bulk frozen.

The volume of frozen retail packs sold in supermarkets (amounting to 450 tons in 2006) is increasing, with more and more local cold stores entering this market (Libertas, Malina Produkt, Frikom, Sigma, and ML). Two of them, Libertas and Malina Produkt, also produce private-label packaging for Maxi and Metro, respectively. Companies earn a slightly higher price selling to local supermarkets than to foreign ones, but volumes are still relatively insignificant.

A small amount of raspberries are used by farmers' households, which usually produce juices and jams from them for their personal consumption.

A small quantity of raspberries are imported for processing, but imports of fresh (pre-cooled) raspberries have been declining: some 22 tons of pre-cooled raspberries were imported in 2006, versus 94 tons in 2005. In 2006, 1,200 tons of frozen raspberries and blackberries were imported. While they are listed in the same category, about 90 percent of these frozen imports were blackberries.

BLACKBERRIES

(Please see [Figure A2, Volumes of Blackberries Used Locally](#).)

Almost 40 percent of blackberry production is not exported. A large portion of local sales, almost 90 percent, goes to juice and concentrate producers. The local processing industry absorbed 11,300 tons in 2006, about twice the quantities it used in 2004. End products made of blackberries are sold equally on local and export markets, with the latter mainly in neighboring countries.

Blackberries are rarely consumed fresh anywhere in the world. The same holds true for Serbia, although that situation is starting to change: the green market absorbed 200 tons in 2006.

Frozen retail packs in other countries are most commonly mixes of blackberries and other berries, though in Serbia, blackberries are sold in single packs (30 tons in 2006).

Due to insufficient yields in Serbia and increased foreign demand, imports of blackberries, though still low, increased in 2006. Imports of pre-cooled blackberries, which did not exist in 2005, rose to 68 tons in 2006. Imports of frozen raspberries and blackberries (listed as the same category) came to 1,200 tons in 2006; as noted earlier, blackberries made up about 90 percent of this volume.

STRAWBERRIES

(Please see [Figure A3. Volumes of strawberries used locally.](#))

According to official statistics, Serbia's total production of strawberries reached 35,400 tons in 2006. Roughly 96 percent of all strawberries produced in Serbia are sold locally, of which 90 percent (about 30,000 tons) are sold to processors to be turned into concentrates, juices, and preserves. With such a high demand for local juice and preserve processing, cold stores freeze only a small amount of strawberries.

One cold storage firm is planning to import 1,000 tons of Chilean frozen strawberries this year for re-exporting in order to meet the demand of its foreign markets.

Local consumers consume more fresh strawberries than other berries. Like raspberries, strawberries could have been bought only in bulk at green markets just a few years ago. Today, an increasing number of farmers and traders sell packed strawberries to supermarkets and green markets. Green market sales of fresh strawberries grew to 1650 tons in 2006, an increase of about 40 percent since 2005. Supermarkets absorbed 500 tons of fresh strawberries and 45 tons of frozen ones.

Imports of fresh strawberries are small, but growing. Most such imports are pre-cooled strawberries, used for further processing; imports of these rose from 52 tons in 2005 to 82 tons in 2006. Almost as many processed strawberries were imported as were exported; imports amounted to 950 tons in 2006, up from 635 tons in 2005. The largest suppliers to the Serbian market are Poland and China, whose export prices are significantly more competitive than Serbia's.

BLUEBERRIES

Total production of cultivated blueberries is small—only 5 tons in 2007, with 15 to 20 tons expected in 2008. All are sold fresh, whether to green markets (2 tons) or supermarkets (3 tons), and all are sold in small packages. Imported blueberries amounted to 250 tons in 2006 (mainly wild blueberries from Montenegro), and these went almost exclusively to juice processors. In addition, 600 tons were delivered to Serbian processors from Kosovo in 2006, but these were not captured as an import. Imports of cultivated blueberries in 2005 are given as 22 tons; however, imports from Montenegro were not captured in this figure, since it was part of the same country at that time.

CURRENTS

During the 1970s Serbia used to produce 3,000–4,000 tons of currants, mainly black and red. The majority was processed into juices and jams at large state-owned processing companies and agricultural cooperatives, while significant quantities were exported as well. However, due to the collapse of large

state-owned processors and lower prices at local markets, in the 1990s growers almost completely abandoned production of currants and shifted to more profitable raspberries. Nowadays Serbia's annual production of currants is insignificant, totaling from 100 to 150 tons, and it is not even statistically recorded. The majority of this produce is processed into fruit juices or used for making mixed frozen fruit packs, while approximately 40 percent is sold fresh at green markets and/or consumed in growers' households. In 2006 Serbia imported 40 tons of frozen currants (30 tons of red and 10 tons of black) from Poland for processing purposes, at an average price of \$0.75 per kg.

VALUE-ADDED PRODUCTS

Overall sales of juices in Serbia are 176 million liters, with less than 5 percent coming from imports. Serbian per capita consumption is 23 liters per year, only 50 percent of the European average. Serbia produces small amounts of juice from cultivated berries—mainly strawberry juices, followed by raspberry juices. Some 4 percent of total juice sales (8 million liters) are strawberry juices, with the majority produced by Nektar, Fresh & Co, Agroekonomik, and Vino Zupa. The USAID-supported launch and promotion of Fresh & Co.'s 100 percent raspberry juice, which won the Best New Innovative Juice Award in 2005, was a driving force in the development of other retail berry juices in Serbia and in other countries as well.

With only 4,000 tons of pre-cooled raspberries sold to local processors, raspberry juice production is very modest, representing less than 1 percent of all juices sold in Serbia. Raspberry juices and strawberry juices are produced by the same companies.

Production of concentrates is still quite limited, since large state-owned companies with the capacity for producing concentrates, such as Budimka³ and Dzervin, are still not privatized or operational (their facilities are temporarily shut down). Major concentrate producers include Nektar (which bought Vladicin Han, one of the state-owned factories), Vino Zupa, Frigonais, Agroekonomik (which produces a puree line in Blace), Podgorina, and Medoprodukt (which produces a puree line in Tavenkut, primarily for Fresh & Co.), With the exception of Frigonais and Podgorina, these are also retail juice companies.

Foreign direct investment (FDI) is significant in this subsector, as Coca-Cola bought Fresh & Co. and Grünwald bought Podgorina, while Rauch and a Bulgarian company made investments in Koceljeva and Valjevo-Srbijanka (both starting production in October 2007).

Production of conventional dried berry products is still limited, since the conventional drying process requires the use of fresh berries (the season lasts for six weeks). Production equaled 12 tons in 2006 and all went to exports. The main producer is Agranela. No dried raspberries were imported.

The only freeze-drying operation in Serbia is at Van Drunen (financed by U.S. FDI), with annual production of freeze-dried berries reaching 130 tons. All production is exported, and there are no imports of freeze-dried berries into Serbia.

ORGANIC PRODUCTS

Organic berry products fall into two main categories in Serbia:

³ Budimka was privatized while this report was being finalized; however, the new owners plan to gradually start using the processing premises only during the second half of 2008.

- Organic juices, concentrates, and purees, certified by internationally recognized bodies, are produced by Nektar and Medoprodukt. The majority of the organic concentrates and purees they produced in 2006 went to export. Previously, Agroekonomik and Vino Zupa also produced organic juices; however, their current status could not be confirmed. Prices for organic products average 30 percent higher than for conventional ones.
- Organic frozen berries were primarily exported in 2006 by the Zadugar and Golden Falcon cold stores. Total exports of frozen organic berries were 2,000 tons of cultivated organic raspberries and 500 tons of cultivated organic blackberries.

Imports of organic berry products are insignificant in quantity (mainly fruit juices), while sales of fresh organic berries on the domestic market do not exist.

THE EXPORT MARKET

RASPBERRIES

(Please see [Figures A4, Raspberry Exports 2001–2006](#), and [A5, Berry Fruit Export Prices 2001–2006](#); and [Table A1, Raspberry Exports in 2006](#).)

Raspberries are one of Serbia's top export commodities. About 90 percent of all raspberries produced went to foreign markets in 2006, mainly to Germany (18,000 tons), France (14,000 tons), Austria (10,000 tons), and the UK (3,500 tons). Exports to the United States amounted to 110 tons in 2006. The export price is heavily affected by global supply and demand as well as by the dollar-euro exchange rate. In 2001, the average export price was only \$1.00/kg; it reached a high of \$1.65/kg in 2004 before dropping to \$1.44/kg in 2006. In 2006 Serbia exported frozen raspberries to Germany at \$1.413/kg, while average prices by its main competitors ranged from \$1.434/kg (Hungary), through \$1.619 /kg (Bulgaria) to \$1.73/kg (Netherlands). The average price of Poland's raspberry exports to Germany is quite a bit lower (\$0.929/kg), due to high share of pre-cooled raspberries in total exports from Poland.⁴

Serbia is still not exporting fresh raspberries, although the price for fresh raspberries is several times higher than for frozen. Fresh raspberries from Spain, for instance, fetched an average \$7.87/kg in 2006, while fresh raspberries from France averaged \$9.26/kg.

Precooled raspberry exports (raspberries shipped in tanks for processing) have a 7 percent share of total raspberry exports, with an average price of \$1.00/kg. This figure has been declining: in 2002, the share of pre-cooled raspberries was 17 percent. Serbia should continue move away from exporting low-priced pre-cooled raspberries and shift the valued-added processing of juices and concentrates back to Serbia.

Exports of the highest quality—individually quick frozen (IQF) whole fruit (“rolend”) raspberry—made up 34 percent of total raspberry exports, with an average export price of \$2.00/kg in 2006. The share of rolend raspberries in the total has risen steeply in recent years, being a mere 0.4 percent in 1999. The European market accounts for 97.5 percent of Serbia's frozen raspberry exports. In 2006 Serbia maintained 65 percent of the EU's total imports of frozen raspberries, with substantial market shares in a number of countries—Austria, 63 percent; France, 47 percent; Germany, 37.5 percent; Belgium, 30.5 percent; Netherlands, 23.5 percent; and the UK, 21 percent.

⁴ Source: International Trade Centre (ITC) Trade Map.

However, comparing average export prices of raspberries with those for strawberries and blackberries, we can see that the other two berries have a much higher and more constant rate of growth. In 2006, the export prices of strawberries and blackberries even surpassed the export price for raspberries. This trend may be partially attributed to an increase in world raspberry production and lower demand, but is also a result of improved marketing of strawberries; stronger promotion of the health benefits of darker fruits, such as blackberries; and the historical higher prices for raspberries, which drove processors to less expensive fruits.

BLACKBERRIES

(Please see [Figure A6, Blackberry Exports 2001–2006](#), and [Table A2, Blackberry Exports in 2006](#).)

Blackberry exports reached 20,000 tons worth \$31 million in 2006. The share of export in total blackberry production was 60 percent. The volume of exports during three years 2004–2006 held steady at 20,000 tons, but the export price increased from \$1.20/kg in 2004 to \$1.57/kg in 2006, following a steady growth trend since 2001 (due to the much higher share of roland quality exports in the total). The main foreign markets for 2006 were Germany (4,700 tons), Austria (2,500 tons), Holland (2,100 tons), and France (1,000 tons). Exports to the United States were reported at 360 tons in 2006.

Since blackberries are not consumed fresh in Europe, there are no fresh blackberry exports. Precooled blackberries constituted 14 percent in total blackberry exports, with an average price of \$1.43/kg. This is up from 2001, when the share of pre-cooled blackberries was only 2 percent. Precooled blackberries are now in high demand by processors in the world due to the widespread promotion of their health benefits. The highest quality roland blackberries reached a 70 percent share in total blackberry exports, with \$1.70/kg average export price. In 2001 this share was only 2 percent.

STRAWBERRIES

(Please see [Figure A7, Strawberry Exports 2001–2006](#), and [Table A3, Strawberry Exports in 2006](#).)

Strawberry exports reached \$2.1 million and 1,400 tons in 2006. With the recovery of Serbia's local juice and preserves industry, higher quantities of strawberries are sold to local processors and less is exported as frozen or pre-cooled. Due to heavier domestic consumption and higher global demand for strawberries, as well as the increased value of the euro versus the dollar, the average export price grew to \$1.55/kg in 2006, as against only \$0.60/kg six years previously.

Precooled strawberries made up 21 percent of total strawberry exports in 2006. A very small quantity of fresh strawberries, 500kg, was exported to France at a price of \$5.00/kg, pointing to a high potential for profit. Frozen strawberries without sugar had a 52 percent share of total strawberry exports, with an average export price of \$1.60/kg, while frozen strawberries with sugar reached a share of 28 percent, with an export price of \$1.90/kg.

The European Union accounts for 80 percent of Serbia's frozen strawberry exports, with the largest buyers being Belgium, Greece, the Netherlands, and Germany. The United States is Serbia's fifth largest buyer, accounting for 13.68 percent of total frozen strawberry exports. The average price for Serbia's frozen exported strawberries in 2006 was \$1.70/kg, versus \$1.52 for frozen strawberries exported from the United States; from Spain, \$1.06; from Poland, \$1.34; from China, \$0.86; from Italy, \$1.48; from

Germany, \$1.23; and from Morocco, \$0.85. Such a high price for Serbia's strawberries is result of exporting almost exclusively top IQF quality. At the same time, Serbia's imports of frozen strawberries—primarily from Poland and China—almost match its total exports. Serbia does not have competitive advantages in frozen strawberries.

BLUEBERRIES

Serbia exports no cultivated blueberries, and its exports of blueberry concentrate are completely processed from wild fruit. However, there are more cultivated blueberry farms emerging in Serbia, and we expect to see the gradual development of fresh blueberry exports in the next few years.

CURRENTS

Because its production costs are higher than those of the leading producers of currants in Europe (Russia, Poland, and Germany) and because its output is very small, Serbia cannot compete with large producers of currants for industrial processing; in fact, the country is a net importer of currants. Nevertheless, it still exports some currants, confirming that a foreign market for Serbian currants still exists. In 2006, Italy, Montenegro, and Macedonia imported a total of 8.5 tons of top-quality frozen currants (7.5 tons of red and 1 ton of black) from Serbia, with a total value of \$15,813. Based on the increasing interest of EU consumers in fresh berries, this subsector has the opportunity to increase exports of currants as well, especially fresh and as a supplement in fruit mixes.

VALUE-ADDED PRODUCTS

While Serbian statistics do not track the export of berry juices and concentrates as a separate category, the ITC Trade Map states that in 2006 Serbia exported 17,700 tons of berry juices, with an export value of \$20.9 million. Primary importing countries of retail berry juices were the former Yugoslav countries, including Montenegro, with 7,238 tons; Bosnia and Herzegovina, with 4,474 tons; and Macedonia, with 2,564 tons. Combined retail juice exports to member countries of the Central European Free Trade Agreement (CEFTA) accounted for \$8.6 million, or 41 percent of Serbia's berry juice exports.

For berry juice concentrates, the primary importing countries were Germany, with 1,087 tons, and Austria, with 1,434 tons. Combined, concentrate sales to Germany and Austria accounted for \$9.8 million, or 47 percent of Serbia's berry juice exports. For the period 2002–2006, Serbia enjoyed a compound annual growth rate of 17 percent for their berry juice exports to all importing countries.

Current free on board (FOB) export market prices for 65° brix raspberry concentrate are \$65.00/gallon to Chile and \$77.00/gallon to Poland. ("Brix" is a measure of sugar content.) At Serbia's pre-cooled export price of \$1.10/kg, Serbia's market opportunity in raspberry concentrate is as follows: the cost of the fruit needed for 1 gallon of 65° brix concentrate is \$41.00/gallon (37.5 kg raspberries = 1 gallon 65° brix concentrate). Subtracting this cost from the current Polish market export price of \$77.00 leaves a processing and sales margin of \$36.00/gallon. Moreover, if Serbian juice processors bought raw materials directly from growers at \$0.50/kg—the price reported by growers for their sale of pre-cooled prices to cold stores—then the price for 65° brix concentrate would be \$18.90/gallon. Subtracting this from the Polish price of \$77.00/gallon would leave a processing and sales margins of \$58.10/gallon. Evidently, there is a substantial profit opportunity if Serbian processors bring the raspberry concentrate processing business home. These observations also apply to blackberry and blueberry processing. While their market prices are different, the margins that Serbian processors could enjoy are substantial.

Exports of berry preserves were increasing but modest in 2006. About 11 tons of strawberry preserves and only 1 ton of raspberry preserves were exported.

Exports of conventional dried berries were 12 tons in 2006; of freeze-dried berries, 130 tons. Agranela and Van Drunen are the primary exporters in these two categories.

ORGANIC PRODUCTS

The development of organic berry concentrates and purees is in its infancy. We expect to see an increase in production and exports during the next few years as the result of previous USAID assistance to the sector. About 2,000 tons of frozen cultivated organic raspberries and 500 tons of blackberries were exported in 2006.

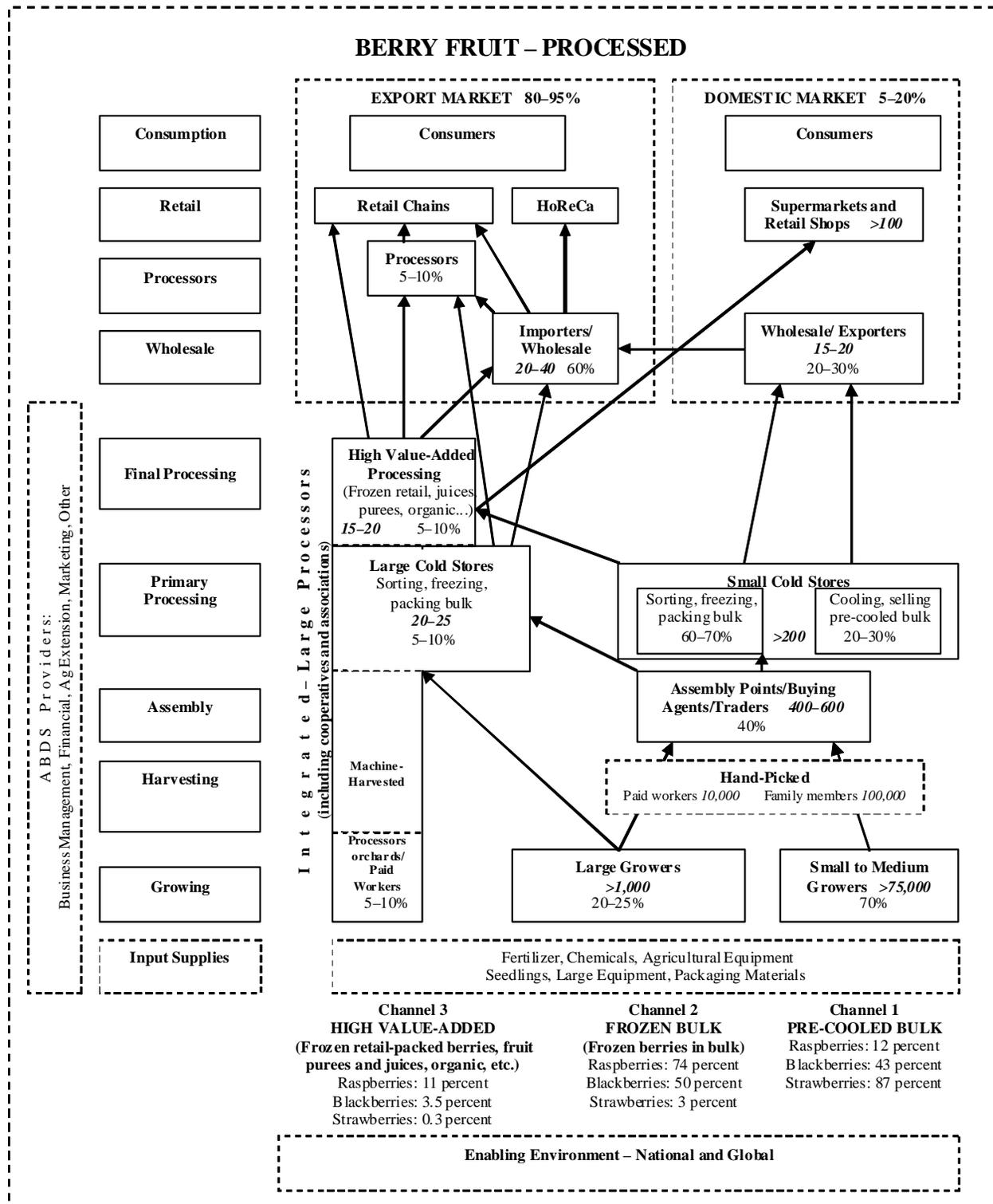
3. SUBSECTOR MAP⁵

Two overall subsector maps are presented here, for the processing and fresh berry value chains. Information in the processing value chain map is further broken down for each berry product into the pre-cooled, bulk, and retail pack categories. Quantities and prices for each channel are presented in [Table A4, Subsector Channels](#).⁶

⁵ The value chain map for berries is dynamic, and prices and quantities change every year. We can use it as a reference source only for 2006; it does not necessarily represent facts for 2007 or any other year.

⁶ Numbers in bold italics represent absolute numbers of stakeholders operating within a specific value chain function, while percentages represent the structure of a specific value chain function.

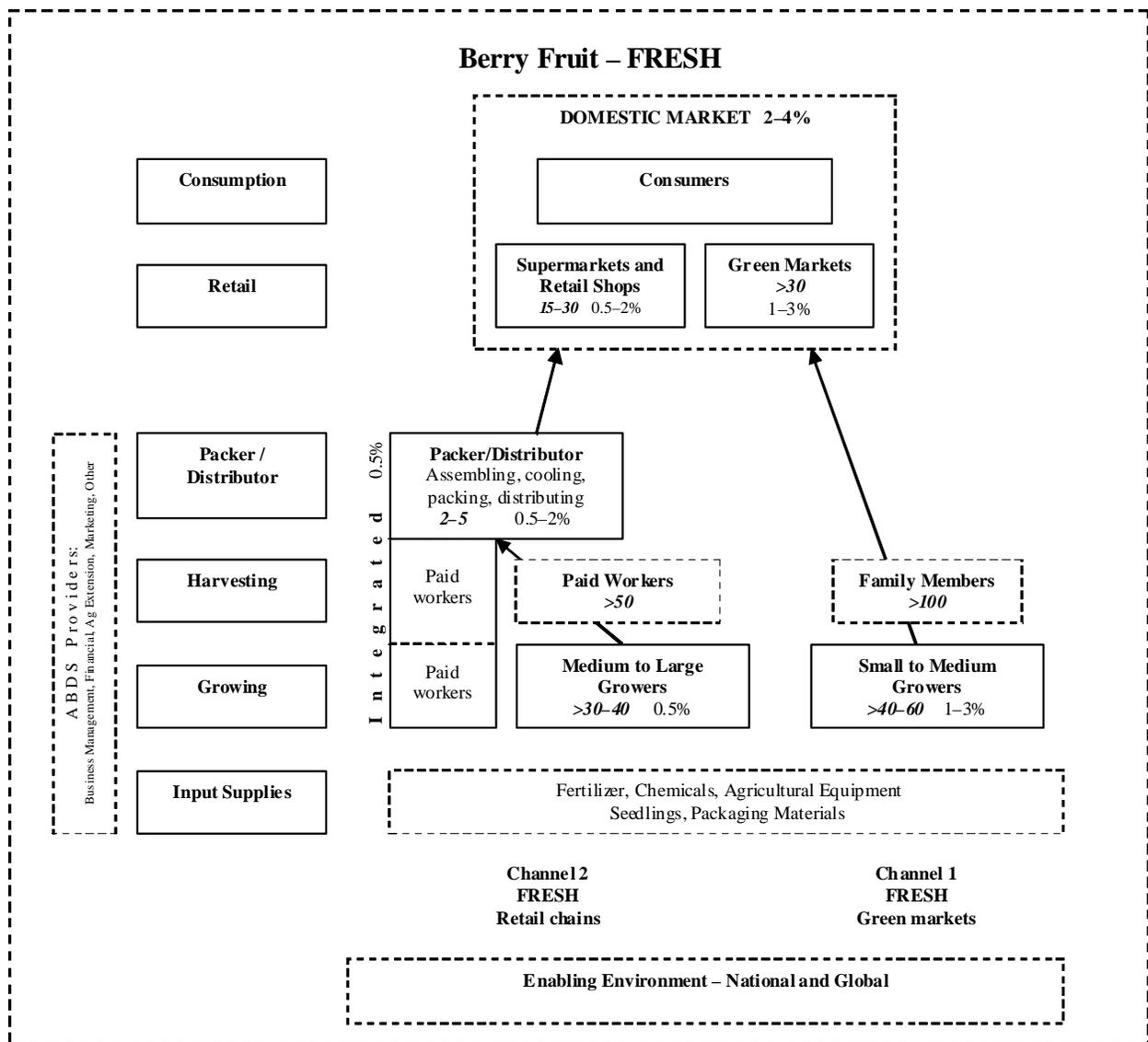
FIGURE 1: VALUE CHAIN MAP FOR SERBIA'S PROCESSED BERRY MARKETING CHANNELS



The processing berry value chain is very complex, involves many participants, and is evolving. Only a few years ago, the frozen retail channel did not exist, as cold stores were selling all berries as pre-cooled or bulk frozen. The bulk frozen channel still has the highest share, as 74 percent of all raspberries produced and 50 percent of all blackberries produced go through it. Strawberries, being locally processed, have the highest flow in the pre-cooled channel—87 percent of all strawberries produced in Serbia are traded within it. The retail pack channel, as a future direction for the frozen berry business, is growing, but is still small, representing respectively 11 percent, 3.5 percent, and 0.3 percent of all raspberries, blackberries, and strawberries produced in Serbia.

The fresh berry value chain is much simpler, as fresh berries are traded only within the country.

FIGURE 2: VALUE CHAIN MAP FOR SERBIA’S FRESH BERRY MARKETING CHANNELS



It should be noted that 3 percent of raspberries, 3.5 percent of blackberries, and 9 percent of strawberries are absorbed by the fresh berry value chain. This channel can be further split between home use, bulk, and small packaging channels. A detailed explanation of all channels is provided in discussion by channel.

DISCUSSION BY FUNCTION

INPUTS

Inputs for berry production are much more expensive in Serbia than in other countries: Serbia has no major producers of fertilizers or pesticides, and plants of new varieties usually have to be imported, since there are no modern nurseries in Serbia. Farmers also lack knowledge about which inputs to use and how to use them. State-owned extension services function poorly. Irrigation, greenhouses, and anti-hail nets are not used in 99.9 percent of berry production. Serbian farmers rely on traditional ways of production, and they need to be educated in modern technologies.

BERRY GROWING AND HARVESTING

Raspberries. Serbia is the biggest producer of raspberries in the world, with production reaching 80,000 tons in 2006 ([please see Figure A8, Production of Raspberries 2001–2006](#)). Raspberries are also the most commonly grown berries in Serbia, occupying 65 percent of all land planted to berries in the country. The main varieties are Willamette (almost 95 percent of all raspberries) and Meeker. These varieties are rich in flavor and color, traits that are highly appreciated for processing but not for fresh consumption. Harvesting lasts for only six weeks in June and July, overlapping harvesting in other competing countries. According to the Food and Agriculture Organization (FAO), raspberry yields in Serbia in 2004 were 5.7 tons/hectare, while official Serbian statistics reported 5.4 tons/hectare in 2006. As shown in Table 1, even though the yields of Serbian raspberries are far below those achieved in the United States, the Netherlands, and Hungary, Serbia is still more productive than its main competitors in Europe: Poland harvests only 4 tons/hectare and Bulgaria 5.3 tons/hectare. Raspberries are grown on 70,000 farms, located mainly in Central and Western Serbia. The farms' average size is small—roughly half a hectare—which is easiest for the farmers to manage, since raspberry farming requires much manual labor, and in any case little suitable adjoining land is available to buy or rent to expand operations. Raspberries are almost exclusively hand picked.

TABLE 1. Raspberries: Production Volume and Yields in Selected Countries (2001–2004)

Country/Year	Yield (kg/ha)				Production (tons)			
	2001	2002	2003	2004	2001	2002	2003	2004
United States of America	8,395.02	8,351.09	10,036.01	10,079.85	51,982	51,710	62,143	61,598
Netherlands	8,000.00	10,000.00	10,000.00	10,000.00	400	500	500	500
Hungary	6,823.59	6,819.25	6,612.85	7,058.33	13,306	9,847	9,258	8,470
Serbia*	5,555.78	6,152.43	4,839.59	5,734.60	77,781	94,366	79,471	91,725
Bulgaria	4,071.15	4,063.98	3,681.69	5,349.23	3,147	3,938	4,083	5,606
Russian Federation	4,666.66	5,000.00	4,545.45	5,151.51	140,000	165,000	150,000	170,000
Poland	3,469.96	3,344.56	3,240.09	4,000.00	44,818	44,874	42,941	56,800
World	4,885.71	5,049.44	4,692.21	5,289.52	432,044	471,133	442,006	498,987

*including Montenegro

Source: FAOSTAT | © FAO Statistics Division 2008

Only one cold storage firm, Libertas, is vertically integrated all the way to the field. Libertas is the role model for all other berry farmers and cold stores, with 100 ha of land planted to different berries, mechanical harvesters, and GlobalGAP, Hazard Analysis and Critical Control Point (HACCP), and British Retail Consortium (BRC) certifications. However, a few farmers with more than 10 ha of land have started to plant new varieties, such as Polka and Polana, which are suitable for fresh markets. By using new varieties, such as Heritage, Polka, Glen Ample, and Autumn Bliss, farmers may extend their harvest up to four months; with new technologies in place (production in tunnels), it could even reach six months. There are also ways in which yields may be increased and the shelf life of fresh raspberries may be extended up to 10 days, which is important for exports. Fresh varieties usually are not good for processing, but there are some varieties, such as Heritage, which can be used both ways.

Blackberries. Serbia is one of the biggest producer of blackberries in the world, with production fluctuating around 30,000 tons. ([Please see Figure A9, Production of Blackberries 2004–2006.](#)) Serbian statistics have followed blackberry production only beginning in 2004. The main varieties are Cacak Thornfree, Thornfree, and Black Satin, which fruit in August. Average yields are about 8 tons/hectare. All blackberries are hand picked. Production is very fragmented, with an average size of only few ares. The same 70,000 farmers that produce raspberries as their main cultivar produce blackberries as a small addition.

Blackberries are seldom used fresh. Nevertheless, even only for processing, new varieties like Loch Ness, Chester and Darrow, with higher quality and a longer harvesting season, can increase sales.

Strawberries. Serbia is also a relatively big producer of strawberries for processing. ([Please see Figure A10, Production of Strawberries 2001–2006.](#)) Production, however, is fragmented: 2,000 farms grow strawberries on an average plot size of 0.3 ha. The main variety produced in Serbia is Senga Sengana, a processing variety characterized by low yields, small fruits, and low resistance to diseases. The average yield is 4 tons/hectare, far below the world average of 8 tons/hectare and minuscule compared with the yields achieved by Serbia's main competitors for fresh strawberries—Spain, Italy, and Morocco—which attain 40–50 tons/hectare.

Strawberries are mainly produced in open fields in South Serbia. In last few years some farmers, mainly in Vojvodina and Central-West Serbia, have started to produce new varieties on mulch foil and in greenhouses for fresh consumption. However, another production type—a vertical growing system in which plants are grown in Styrofoam pots hung around a 2-meter-high post—proved not to be good for raising strawberries. This system needs to be changed into a horizontal one. Greenhouse production represents less than 1 percent of total production.

Strawberries in Serbia are harvested in June and July. With new varieties suitable for fresh consumption, like Camarosa and El Santa, the season may be extended and quality improved.

Blueberries. Production of **cultivated** blueberries did not exist until last year, when the Arinova Farmers' Association, with help from a USAID project implemented by International Relief and Development, imported the first blueberry plants, followed by a few other farmers in Ljig. Current production of blueberries is estimated at 5 tons grown on 20 hectares for the first season following planting. Varieties are Duke, Ozarkblue, Nui, Reka, and Bluecrop, all suitable for fresh consumption. More farmers are planning to start production of blueberries soon, and land under cultivation will double within the next year.

Currants. As mentioned before, Serbia’s production of currants during the last two decades has dropped to 100–150 tons. Most common are domestic varieties, led by Cacanska Crna, which was developed by the fruit research institute in Cacak. However, due to increased demand from the Serbian processing industry and exporters of fresh and frozen currants, the situation has started to change in recent years. A few groups of growers from Central Serbia and the Prokuplje region have set up new orchards and introduced new varieties of currants that will help them to improve yields and expand the season.

Until few years ago, farmers and cold stores were treating each other as “enemies.” But with the development of a dozen cold stores that are run modern style, the situation has changed. Large cold stores now have firm contracts with groups of farmers (with 70–200 farmers per group on average) whom they provide with an on-call agronomist, pesticides, and new plants if needed. Cold stores organize collection points and pay their farmers regularly. The price is set on a level that satisfies both sides. However, there are still many traders and small cold stores that distort the market by temporarily buying or selling the fruit at unrealistically high or low prices that vary significantly from the market prices.

TRANSPORT

Farmers usually take their products to nearby collection centers organized by cold stores and other processors. Processors then take it with their own trucks to factories.

COOLING, SORTING, PRE-PACKING, FREEZING, PACKING

While there are about 250 cold stores in Serbia, only 40 are HACCP certified, according to the national cold store association. Modern cold stores (larger than 2,000 tons), with HACCP, BRC and other standards in place, have a positive impact on the rest of the market. Presently they handle around 40 percent of raspberries. The majority of modern cold stores (like Libertas, Sirogojno, Malina Produkt, Zadugar, Atle, Flora, Hibrid, Frigo Nais, ITN, Sicobery, Frikos, Frigo Paun, Yugotrade, Agropartner, and Mondi Serbia), founded in the past 5–10 years, are taking over the sector.

In the 1990s, the sector was run by state-owned cold stores and small cold stores, which sold their products to traders instead of exporting directly. They exported mainly lower-quality berries, getting very low prices. All quantities exported were in bulk. By contrast, modern cold stores, with professional management, have direct contacts with foreign buyers, and they export higher-quality berries to processors, importers or even retail chains directly. The majority of their strawberries go in retail packs, for which they charge 50 percent more than for bulk strawberries.

Many small cold stores have developed business relationships with the larger, modern cold stores, for which they now serve as collection points. Since they are in many cases based in remote rural areas, it is easier for farmers to sell to them instead of going to other collection points.

Small cold stores cool berries to 0 degrees centigrade, then freeze them in freezing chambers or “tunnels” and sell them to larger cold stores or traders. Larger cold stores then sort, pack, and export the berries. Large cold stores, in the majority of cases, however, buy berries directly from farmers in their surroundings. They cool, sort, pre-pack in larger packaging, and freeze them and also pack them in retail packs if needed. Berries are exported in 20-ton refrigerated trucks to foreign buyers.

LOCAL TRADERS

In most cases, traders that deal with berries just buy frozen product from small cold stores or subcontract cold stores to work for them. Traders are slowly leaving the frozen berry business. However, in the fresh berry business they are still present in larger numbers.

PROCESSING

Processors like Nectar, Agroekonomik, Fresh & Co, Rauch (juices, concentrates, and purees), Van Drunen (freeze-drying), Foodland, Foodex, Desing, Nikom, and Slovan (preserves) are getting more involved in the berry sector. They usually buy pre-cooled berries, process them, and sell them locally or internationally. In the blackberry and strawberry subsectors they process significant amounts, while raspberries are still processed in small quantities. Big state-owned processing facilities once led the sector; a few are still waiting to be privatized.

LOCAL RETAIL MARKETS

The local retail markets have still not developed for berry products. Major retailers, like Maxi, Metro, Merkator and Rodic, Interex, Idea, and Vero are significant driving forces in the retail market. Their role should increase in coming years. Green markets still play a major role in the fresh berry business, as the majority of fresh fruits are sold there.

INTERNATIONAL WHOLESALE MARKETS

Foreign importers and distributors play a significant part in the berry value chain. The majority of trade goes through them, though local producers are gradually starting to export directly to the final buyers.

FOREIGN PACKERS

Foreign packers get berries in bulk, sort them, pack them in retail packs, and send them to supermarkets. An increasing number of cold stores have succeeded in bypassing them and selling retail packs directly to retail markets, earning additional 20 percent on the price.

INTERNATIONAL MARKET

The main final buyers are supermarkets (such as Edeca, Reve, Metro, Tesco, and Sainsbury); hotels, restaurants, and catering (HoReCa); and processors. Cold stores increasingly sell directly to them instead of going through wholesalers.

DISCUSSION BY CHANNELS AND GOVERNANCE STRUCTURES

RASPBERRIES

Raspberries for Processing

Precooled ([please see Figure A11, Pre-Cooled Raspberry Channel](#)).

The pre-cooled channel absorbs 12 percent of all raspberries produced, or 9,600 tons, of which 5,600 tons is exported and rest is locally processed, mainly for domestic consumption. The lowest-quality raspberries are sold in this channel, and the average price to farmers is \$0.70/kg. Small cold stores—up to 2,000-ton capacity—export 75 percent of total pre-cooled exports, while 25 percent goes through large cold stores.

Large cold stores export directly to foreign processors, earning from \$1.10/kg to 1.50/kg, while small ones sell to importers firstly, earning \$1/kg less. The pre-cooled channel should gradually disappear as an export category, as it is to be hoped that all quantities will be absorbed by local processors or further processed into frozen berries; large cold stores are already turning to other, more profitable exports.

Frozen bulk ([Please see Figure A12, Bulk Frozen Raspberry Channel.](#))

This channel absorbs 61,000 tons, or 74 percent, of all raspberries produced in Serbia. Mid- and high-quality classes of raspberries are sold through this channel, to foreign processors, HoReCa, and foreign supermarkets as final buyers. About 15 large cold stores process approximately one-third of all raspberries exported.

Farmers sell raspberries to small and large cold stores for \$0.70/kg on average. Small cold stores increasingly depend on large cold stores to buy frozen raspberries from them and further sort, pack, and sell them to foreign buyers. Small cold stores sell 35 percent of their raspberries to local traders, though this share is decreasing as traders are being eliminated from the value chain. Half of small cold stores' production goes to foreign importers. Large cold stores command higher prices, as they sell higher-quality berries and have long-term relationships with their buyers. The highest-quality raspberries go to foreign packers, who package them in retail packs and sell them to supermarkets.

All cold stores originally used to sell their products to packers; when their relationships grew stronger, they started to pack raspberries themselves and sell retail packs that are used for home baking. There is considerable potential for taking the 30 percent of raspberries now sold to foreign packers in bulk, packing them in retail packs in Serbia, and selling them for 20 percent more money. Foreign importers buy different categories of products, sort, and sell them to supermarkets, HoReCa, or foreign processors according to quality. The lowest quality of bulk raspberries is sold to foreign processors.

Retail frozen raspberries ([Please see Figure A13, Retail Frozen Raspberry Channel.](#))

Eleven percent of Serbia's total raspberry production is now absorbed by this, the highest value-added channel among processable raspberries. This share will rise in following years. Only the highest-quality raspberries, for which farmers are paid \$0.90/kg, are sold in retail packs. Approximately one-third of the raspberries sold in this channel are frozen in small cold stores and sold in bulk to large cold stores, who add them to the raspberries frozen in their own cold stores, sort them all, pack them, and sell them to local retail outlets (5 percent), foreign distributors (90 percent), or directly to foreign retail chains (5 percent). The highest prices are achieved in sales to local supermarkets; quantities are growing, but still insignificant.

Fresh raspberry channel ([Please see Figure A14, Fresh Raspberry Channel.](#))

Fresh raspberries are sold only locally, and their share in total raspberry production is 3 percent. Most fresh raspberries (1,700 tons) are used by farmers' households, while 560 tons are sold in green markets and 120 tons are sold in supermarkets. Small farms produce 2,200 tons of the total, while bigger farms produce only about 100 tons of raspberries to be used fresh. Small farmers sometimes sell raspberries directly at green markets, usually in bulk. Traders are still important players, and they usually pack raspberries in smaller packs and sell them at green markets or supermarkets for higher prices. Bigger farms are producing new varieties off season, packing them in retail packs, and getting a higher price for them than smallholder farmers or traders.

BLACKBERRIES

Blackberries for Processing

Pre-cooled ([Please see Figure A15, Pre-Cooled Blackberry Channel.](#))

Forty-three percent of all blackberries produced, or 14,000 tons, are absorbed in this channel—a share which is much higher than in the raspberry value chain. Such a high share is attributed to the high demand (and consequent high price) for pre-cooled blackberries for processing, both locally and internationally. Depending on the season, farmers usually get from \$0.80 to \$1.60 for these lowest-quality blackberries.

About 35 percent of total blackberry production is sold to local processors, which use it to produce concentrates, purees, and preserves. A much smaller portion is exported, with small cold stores contributing 86 percent of exports, while large cold stores contribute only 14 percent. Small cold stores export most pre-cooled blackberries to foreign importers and brokers, while large cold stores sell it directly to foreign processors. Since pre-cooled is the lowest-quality product, there is no substantial differentiation in quality or difference in price between large and small cold stores.

Frozen bulk ([Please see Figure A16, Frozen Bulk Blackberries.](#))

Frozen blackberries in bulk absorb 50 percent of total blackberry production. Farmers get \$1/kg selling blackberries to large and small cold stores. Blackberry bulk channel is organized in the same way as the corresponding raspberry channel—just prices and quantities are different. For example, large cold stores sell much higher volumes to packers than in the case of raspberries, since there is a trend for supermarkets not to sell blackberries in single packs but rather for packers to consolidate different berries into a mixed pack. Export prices for blackberries were slightly higher than for raspberries in 2006.

Frozen retail ([Please see Figure A17, Frozen Retail Blackberries.](#))

Only 1,000 tons of blackberries were sold through this channel in 2006. Large cold stores are the driving force here, as they do all the sorting, packing and selling of retail blackberry products. One-third of their frozen blackberries come from small cold stores, and 700 tons are frozen in their own cold stores. Farmers are paid \$1.20/kg and small cold stores about \$1.40/kg. Most retail packs (90 percent) are sold to foreign distributors, while 3 percent are sold to local supermarkets and 7 percent to foreign supermarkets.

Fresh blackberries ([Please See Figure A18, Fresh Blackberries.](#))

Around 3.5 percent of all blackberries produced are sold through this channel. Eighty percent (or 800 tons) are used in farmers' households, and only 200 tons are sold commercially on green markets. Farmers sell 150 tons directly at green markets, earning \$2/kg, while traders sell only about 50 tons at the same price.

STRAWBERRIES

Processing

Pre-cooled ([Please see Figure A19, Pre-Cooled Strawberries.](#))

Eighty-seven percent of total strawberry production is sold through this channel. Almost all (99 percent) is sold to local producers of concentrates, purees, juices, and preserves. Only 1,400 tons are exported, almost all through small cold stores who sell it further to foreign importers, earning \$0.90/kg, compared to \$0.70/kg obtained by farmers. Large cold stores sell it to foreign processors for \$1/kg.

Bulk frozen ([Please see Figure A20, Frozen Bulk Strawberries.](#))

Only 3 percent of total strawberry production is absorbed by this channel. Small cold stores in the south of Serbia are major players, since large cold stores do not get enough strawberries for freezing. The share of small cold stores in the bulk frozen channel is 80 percent; only 10 percent of their products are sold to the large cold stores, while the rest goes to importers and local traders. Large cold stores sell almost equal quantities to foreign processors, importers, and packers.

Frozen retail ([Please see Figure A21, Frozen Retail Strawberries.](#))

Only small quantities of strawberries are left for frozen retail sales, which absorb only 0.3 percent of production. Large cold stores are major participants: they buy strawberries for \$1.30/kg from farmers, then freeze, pack, and sell them to local retail chains (5 percent), foreign retailers (10 percent) and distributors (90 percent). The price they get is about 30 percent higher than for bulk strawberries—on average, \$2.20/kg.

Fresh strawberries ([Please See Figure A22, Fresh Strawberries.](#))

Almost 10 percent of total strawberry production is absorbed by this channel. Modern farms with foil-protected production and greenhouses, using new strawberry varieties, produce approximately 900 tons of strawberries—which they sell off-season, packed in retail packs, for a higher price than other participants in the strawberry value chain. They still sell the majority of their output to green markets, where they get higher prices than if they sell to supermarkets. Farmers raise older varieties of strawberry and consume 1,350 tons themselves, sell 650 tons directly at green markets for \$2/kg and 400 tons to traders for \$1.30/kg on average. While farmers sell their products in bulk, traders pack them and sell for \$4/kg on average.

BLUEBERRIES ([Please See Figure A23–Fresh Blueberries.](#))

Cultivated blueberries are grown on only 20 ha in Serbia, and all are sold in retail packs to supermarkets or green markets. Farmers get \$3/kg on average from traders and \$7/kg at green markets. Traders sell packed blueberries to supermarkets.

CURRANTS

In Serbia, red and black currants are grown on a modest 30–40 ha total, in average yielding 120 tons of produce. Depending on the quality and season, growers are paid \$0.80–\$1.30/kg in bulk by processors, who in average absorb 60 percent of total production. Usually 10 to 15 tons per year is sold by the bigger farmers or traders at green markets for an average price of \$1.50–\$2.50/kg (in bulk) or even \$4/kg if packed in plastic 150–250 gram retail clamshell containers or punnets. The remainder is used for household consumption, either fresh or processed into juices or jams.

LEVERAGE POINTS

The following are some examples of leverage points where the Serbia Agribusiness Project (SAP) can implement its activities:

Large cold stores: Libertas, Sirogojno, Malina Produkt, Zadugar, Atle, Flora, Hibrid, Frigo Nais, ITN, Sicobery, Frikos, Frigo Paun, Yugotrade, Agropartner, Mondi Serbia

Integrated producers: Libertas (Sabac), Agro Plus (Djurdjevo)

Associations: Arinova, Belanovica, Association of Cold Stores, Teras Association of Organic Producers

Retail chains: Maxi, Metro, Mercator, Rodic

4. SUPPORTING ORGANIZATIONS AND REGULATORY FRAMEWORK

SUPPORTING ORGANIZATIONS

The following is a list of some organizations that provide support in one way or another to the cultivated berry subsector:

State or state-owned agencies:

- Ministry of Agriculture
- Serbian Investment and Export Promotion Agency (SIEPA)
- Serbian Chamber of Commerce
- Fruit Research Institute in Cacak
- School of Agriculture in Belgrade
- Network of state-owned agricultural stations
- School of Agriculture in Novi Sad
- School of Agriculture in Cacak

Privately owned:

- Fertilizer distributors (Agromarket, Syngenta, Virginia group, Zeleni Hit, etc.)
- Greenhouse distributors (Vilmorin, ITC, Zeleni Hit, ATP, etc.)
- Nurseries and importers of planting materials (MDS Trade, Econom Cop, Zeleni Hit, Zonex)
- Consulting agencies (Efektus)
- Certification agencies (TUV, SGS, AQA, Ecocert, Suolo e Salute Serbian)
- Extension services (Agriculture Innovation Center in Arilje, Sabac Agriculture Development Center, etc.)

It is important to note that among listed supporting organizations, privately owned agribusiness development services (ABDS) providers are still very rare and small, in terms of both the scope of their activities and the resources they have. This is result of very fragmented production, whose organizers are still usually unable to pay for this kind of services.

REGULATORY FRAMEWORK

Price liberalization. Until few years ago, the state was involved in price regulation. The new, democratic government decided to liberalize the market, so prices now depend on local and world supply and demand.

International Union for the Protection of New Varieties of Plants (UPOV). Serbia is still not a member of UPOV. However, a new law on plant protection in line with EU regulations has been issued, and Serbia should become a UPOV member very soon. When it happens, many international nurseries will establish a presence in Serbia, providing cheaper inputs for Serbian farmers and making Serbian berries even more competitive on foreign markets.

Import of planting material (rootstocks and seedlings). Importing new plants involved a complex procedure until two years ago, when the Ministry of Agriculture made such imports very easy for interested parties. Plants have to undergo health tests, after which they are free to be imported.

Registration of new varieties. When a new variety needs to be registered, whether produced locally or internationally, it can be done easily. Local new varieties have to go through a two-year test period on 10 test plots in Serbia, after which, if they are proven to be in accordance with Serbian legislation, they can be registered. If a new variety from abroad needs to be registered for the first time in Serbia, it can be done instantly, but additional samples need to be provided to 10 test plots in Serbia.

5. SUBSECTOR DYNAMICS

TRENDS AND DRIVERS

The fresh market. The potential market for fresh berries is sizable, both locally and internationally. There is an increasing world supply of frozen raspberries and blackberries, for which the price is stagnant. In order to differentiate itself, it is important for Serbia to start selling fresh berries abroad, as only European producers can compete with it there—unlike the situation with frozen berries, where Chile, China, and the United States are big competitors.

Local sales of fresh berries increased on average 30 percent in last year, though volumes are still very low. Exports of fresh berries do not exist. If Serbia manages to implement new varieties, improve growing techniques and irrigation systems, start producing in greenhouses in order to extend the growing season, and upgrade yields and quality, much higher sales can be reached. The average export price of raspberries was \$1.40/kg in 2006, while fresh raspberries sold for \$3/kg on average in green markets. Prices at foreign terminals—for example, London’s New Covent Garden—were \$10/kg in high season. Farmers and traders should first try to increase local sales. Local customers will consume varieties used for processing, such as Vilamet, as fresh, although such varieties do not have a long shelf life; they bruise easily, and the fruits are small. Supermarkets are willing to buy all the fresh berries that are available, as long as the berries are packed in retail packaging and their delivery and quality are consistent. Supermarkets are paying slightly less than green markets for the same quality and packaging, but are buying higher volumes. Once Serbia is producing significant volumes of fresh berry varieties with an extended season, the country should start focusing on foreign EU markets, such as terminals and retail chains.

Frozen retail packs. Only a few years ago, Serbia did not export any berries packed in retail packs. All quantities were exported in bulk and as pre-cooled. Then, cold stores that were equipped and run on modern principles started to export highest-quality frozen berries to packers. After years of proving their quality, in terms of both products and services, cold stores started to pack their products directly in retail packs and export them for a 30 percent higher price, on average, than for the same quality berries in bulk. The share of retail packs in all berry exports is still very small, representing only 5 percent of the total.

Value-added products. Value-added products, such as dried berries, freeze-dried berries, smoothies, purees, concentrates, juices, preserves, and culinary ingredients (seed extracts, powders, etc.), should be developed in Serbia. Companies should be informed of the potential offered by new value-added products; technical training on the production side should be provided; and pilot projects should be developed with forward-looking companies. To encourage continued sector development, SAP will assist the industry with market education, buyer introductions, and new-product identification based on market opportunities.

Organic products. Organic products have considerable potential on international markets. The price is about 30 percent higher than for conventional products, and the demand for organic berry product is much higher than the supply. Local producers started to produce organic cultivated berries only recently, while organic wild berry products have been present for years. Organic value-added products—concentrates and purees, for example—are produced by few local companies such as Nektar and Vino Zupa.

6. VISION FOR GROWTH

Since Serbia already has a leading share of the world market in frozen bulk and pre-cooled berry products—one that offers very modest growth opportunities, with or without SAP support—we think SAP should concentrate its efforts on high value-added segments, which have high potential and yield attractive profits. Therefore, in the following tables we will concentrate on what we consider the main growth opportunities we have derived from the previous analysis: (1) fresh berries; (2) value-added goods, such as juices, concentrates, and dried products; (3) frozen retail products; and (4) organic berry products. For each of the key constraints we have identified for these specific value chains, we propose a set of actions to be implemented under SAP. We anticipate that by the time the project ends in 2012, the combined effect of these activities will be an annual sales level significantly above where the subsector would be if left to grow unassisted by SAP.

Current sales of the selected berry subsectors amount to about \$72 million annually: \$10 million comes from fresh berries sold exclusively on the local market; \$33 million from value-added products; \$24 million from the frozen retail market (of which only \$1 million is sold on the local market); and \$6 million from organic products.

SAP can have a significant impact working in these subsectors. Our estimates are that with support from USAID/SAP, the berry subsector can achieve growth in these lines to \$295 million annually by 2012, while without SAP support the projected growth would lead to an annual sales volume of only around \$160 million by 2012. To calculate the impact of the SAP project on the berry sector as a whole, we need to take into account that our proposed strategy implies a shift of raw material from frozen bulk to the above value-added categories of berry products. Therefore, we estimate that sales of frozen bulk will decrease. The differential impact of SAP, on an annual basis and correcting for this shift of raw material flows within the berry subsector, will be around \$102 million in 2012 (i.e., \$295 million minus \$160 million in sales that would have happened anyway and minus \$35 million in decreased frozen bulk sales).

MAJOR OPPORTUNITIES

TABLE 2: SALES OPPORTUNITIES FOR BERRIES COMPARING 2006 ACTUAL LEVELS WITH 2012 PROJECTIONS

Commodity Description	2006				2012 without SAP intervention				2012 with SAP intervention			
	Local		Foreign		Local		Foreign		Local		Foreign	
	Q	Value, \$ million	Q	Value, \$ million	Q	Value, \$ million	Q	Value, \$ million	Q	Value, \$ million	Q	Value, \$ million
Fresh raspberries	680	2	x	x	1,000	3	3,000	15	2,000	6	10,000	47
Fresh strawberries	2,100	7.3	x	x	5,000	15	1,500	7	7,400	22	2,500	12.5
Fresh blackberries	230	0.5	x	x	300	0.7	1,000	7	700	1.5	3,000	21
Fresh blueberries	5	0.03	x	x	50	0.32	50	0.32	100	0.6	100	0.6
Frozen retail raspberries	450	1	8,500	20	700	1.5	10,000	30	900	2	17,000	40
Frozen retail blackberries	8	0.02	142	0.3	10	0.025	200	0.4	16	0.04	280	0.6
Frozen retail strawberries	30	0.07	970	2.2	70	0.18	2,000	3	100	0.25	3,000	4.4
Organic frozen raspberries	x	x	2,000	4.8	x	x	4,000	10	x	x	10,000	20
Organic frozen blackberries	x	x	500	1.2	x	x	1,000	2.4	x	x	3,000	4.5
Conventional berry juices, concentrates and purees	8 million liters	10	17,000 tons	20.8	12 million liters	15	34,000 tons	41	25	32	50,000 tons	61
Freeze dried berries	x	x	130	2.5	x	x	500	7	x	x	1,000	14
Conventional dried berries	x	x	12	0.06	x	x	50	0.25	x	x	500	2.5
Conventional dried berries	x	x	12	0.06	x	x	50	0.25	x	x	500	2.5
TOTAL:	20.92		51.92		35.725		123.62		64.39		230.6	

CONSTRAINTS AND POSSIBLE ACTIVITIES TO ADDRESS THE CONSTRAINTS

TABLE 3: MAJOR OPPORTUNITIES, CONSTRAINTS, AND SPECIFIC ACTIONS TO IMPROVE SALES IN SUBSECTOR

Major opportunities	Constraints standing in the way of each opportunity	Specific actions
Fresh Berries	Lack of new varieties with extended season, suitable for fresh consumption	Distribute marketing information on benefits of moving into fresh production
		Develop projects on growing new berry varieties with associations like Arinova and integrated producers like Libertas
		Assist in development of foreign nurseries in Serbia (using FDI) and help local established nurseries deal with new varieties, get in touch with berry producers
	Lack of modern production knowledge	Produce and distribute berry extension materials similar to those produced by SEDP (Serbia Enterprise Development Project) and the Ministry of Agriculture
		Bring in foreign or local experts on growing fresh berry varieties that will work with schools of agriculture, the Institute for Fruits, the extension service, and local producers on modern technologies
	Lack of modern technology—irrigation, greenhouses	Organize study tours to berry greenhouses in Spain, Italy, or Netherlands
		Develop greenhouse projects with associations and companies such as the Arinova cooperative, Zeleni Hit, Igda)
	Lack of standards, particularly GlobalGAP	Work with producers on getting GlobalGAP
	Logistical hurdles	Identify and assist in development of logistical companies to deliver fresh produce to market—air and truck.
	Inadequate packaging	Educate packers on market requirements, labeling innovations, and design approaches
Lack of marketing knowledge and activities	Distribute marketing information on local and international fresh markets	
	Reorganize Agro-SMS project (SMS—short message service)	
	Organize exhibition and visit to Fruit Logistica, Fresh Moscow, Eurofruit-FRESH, Middle East Congress	
	Organize study tours to nurseries, producers, buyers, and terminals in Germany, Netherlands, Spain	
		Organize sales training for producers and associations

Major opportunities	Constraints standing in the way of each opportunity	Specific actions
Frozen Retail Pack Berries		Get producers in touch with foreign buyers such as Greenery, Edeka, Breda, ASDA, Spar, etc.
		Get producers in touch with local supermarkets
	Lack of management and negotiation skills	Organize management training for companies and associations
		Organize training in negotiation with Carr Swanson agency
		Organize financial training for companies in such subjects as financial risk management
	Lack of Associations and Integrated Producers	Support development of export associations and integrated producer organizations
	Lack of marketing knowledge and activities	Organize sales training for companies—provide market information on buyer and consumer requirements
		Organize exhibition and visit to fairs such as SIAL, Anuga, Fancy Food, American Institute of Frozen Food
		Get producers in touch with foreign buyers buying retail packs; organize sales mission to Serbia for buyers to assess local producers
		Work together with Association of Cold Stores on marketing campaign to increase local and regional consumption of raspberries, blackberries, etc.
Work with International Raspberry Association to create and implement global raspberry marketing campaign		
	Organize local services to distribute market information—for example, via press releases to magazines specializing in foreign food, such as <i>Food News</i> and <i>Eurofruit</i>	
Lack of management skills	Organize management training for companies and associations	
	Organize training in negotiation with Carr Swanson agency	
	Organize financial training for companies in such subjects as financial risk management	
Lack of standards	Work with companies on implementing HACCP, BRC, AIB, Halal, and Kosher standards	
Bad packaging design	Support continued education and training for design community and companies	
	Work on individual design projects with companies and design agencies	

Major opportunities	Constraints standing in the way of each opportunity	Specific actions
	Nonfunctional association of cold stores	Work with association on revising statute, organization, and services to be provided to members; assist in making a detailed plan of activities for next five years; help in implementing the plan
Value-added products	Lack of marketing knowledge and activities	Organize sales trainings for companies on the differences in selling bulk products and selling more value-added and culinary ingredient products
		Provide marketing information on new and innovative products companies can produce. Provide financial opportunity guidelines
		Organize exhibition and visit to foreign fairs such as Anuga, SIAL, Fancy Food, Moscow Food Fair, Dubai Gulf Food, Institute of Food Technologists, Food Ingredients Europe, and American Association of Cereal Chemists
		Organize local services to distribute market information—for example, via press releases to magazines specializing in foreign food, such as <i>Food News</i> and <i>Eurofruit</i>
		Organize direct sales. Introduce producers to largest berry concentrate buyers
	Lack of technical production knowledge	Bring in technical experts who will work with schools of agriculture and companies on producing conventional dried product, freeze-drying, processing concentrates, and developing other new value-added products
		Organize study tours to foreign factories producing value-added products
	Lack of standards	Assist in implementation of standards such as HACCP, BRC, Halal, Kosher and Schutzgemeinschaft der Fruchtsaft-Industrie/International Raw Material Assurance (SGF/IRMA) (juices)
Lack of management and negotiation skills	Organize management training for companies and associations	
	Organize training in negotiation with Carr Swenson agency	
	Organize financial training for companies in such subjects as financial risk management	
Organic products	Lack of organically certified companies	Work with Terras (local organic association) on educating local producers on benefits of targeting organic markets
		Assist with organic certification of local producers

Major opportunities	Constraints standing in the way of each opportunity	Specific actions
	Lack of marketing knowledge and activities	Provide marketing information on new and innovative organic products that Serbian companies can produce
		Organize sales and marketing training to companies
		Organize exhibition and visit to foreign organic fairs such as Bifoach, Fancy Food Chicago
		Organize local services to distribute market information—for example, via press releases to magazines specializing in foreign food, such as <i>Food News</i> and <i>Eurofruit</i>
		Assist in organizing Serbia Specialty Food Exporters Association
		Organize direct sales
	Lack of management and negotiations skills	Organize management training for companies and associations
		Organize training in negotiation with Carr Swenson agency
		Organize financial training for companies in such subjects as financial risk management

APPENDIX

Note: Data in this appendix are gathered from the Serbian statistical office and custom office, the Food and Agriculture Organization of the United Nations (FAO), the ITC Trade Map, interviews with Serbia's Association of Cold Stores, large and small cold stores, processors, and the Faculty of Agriculture in Belgrade.

FIGURE A1: VOLUMES OF RASPBERRIES USED LOCALLY (6,820 TONS TOTAL) IN 2006

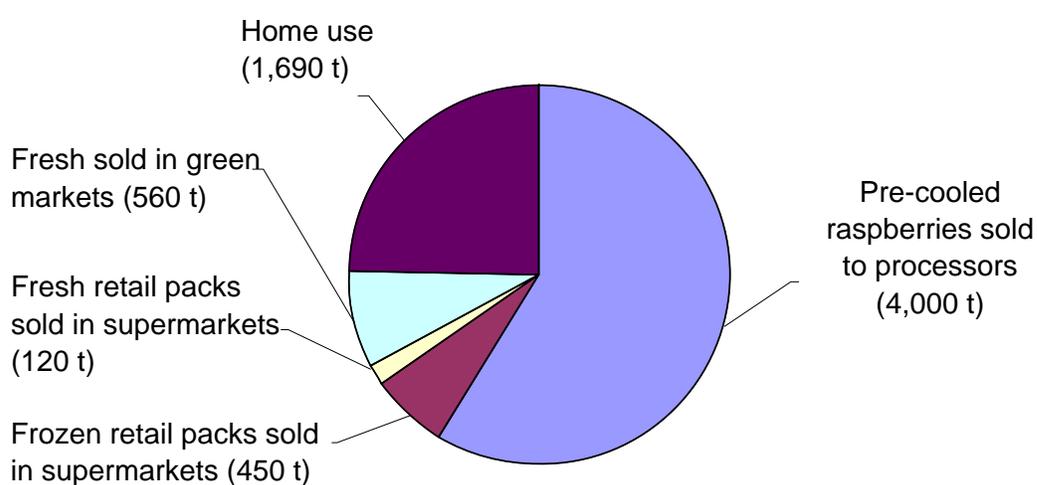


FIGURE A2: VOLUMES OF BLACKBERRIES USED LOCALLY (12,300 TONS TOTAL) IN 2006

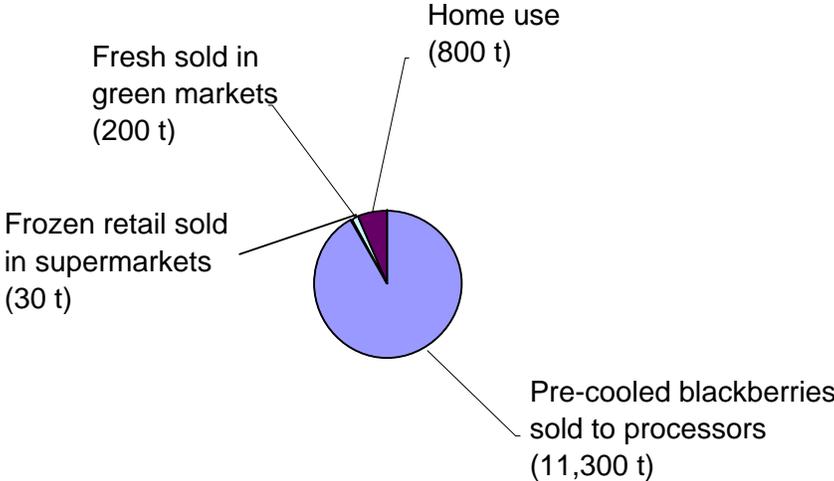


FIGURE A3: VOLUMES OF STRAWBERRIES USED LOCALLY (33,645 TONS TOTAL) IN 2006

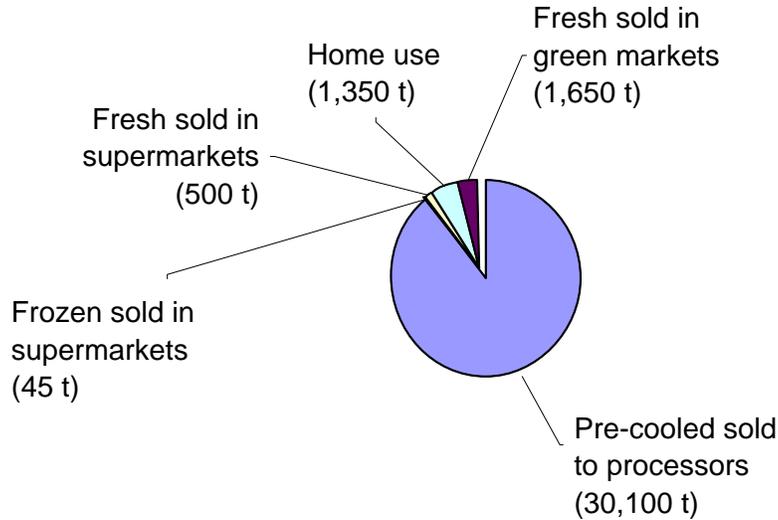


FIGURE A4: RASPBERRY EXPORTS IN QUANTITIES AND VALUES (2001–2006)

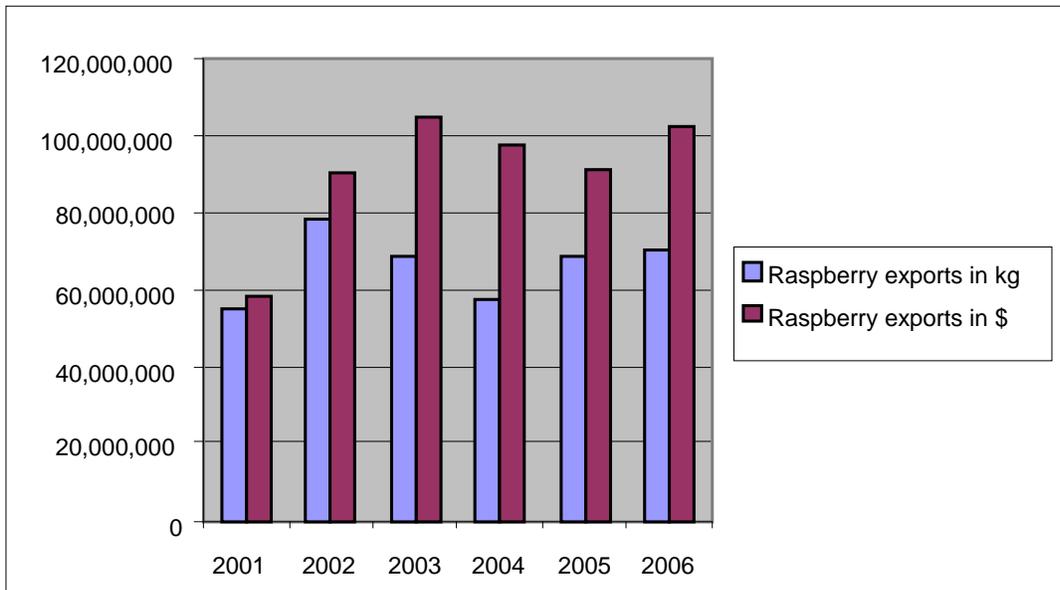


FIGURE A5: RASPBERRY, STRAWBERRY, AND BLACKBERRY EXPORT PRICES (2001–2006)

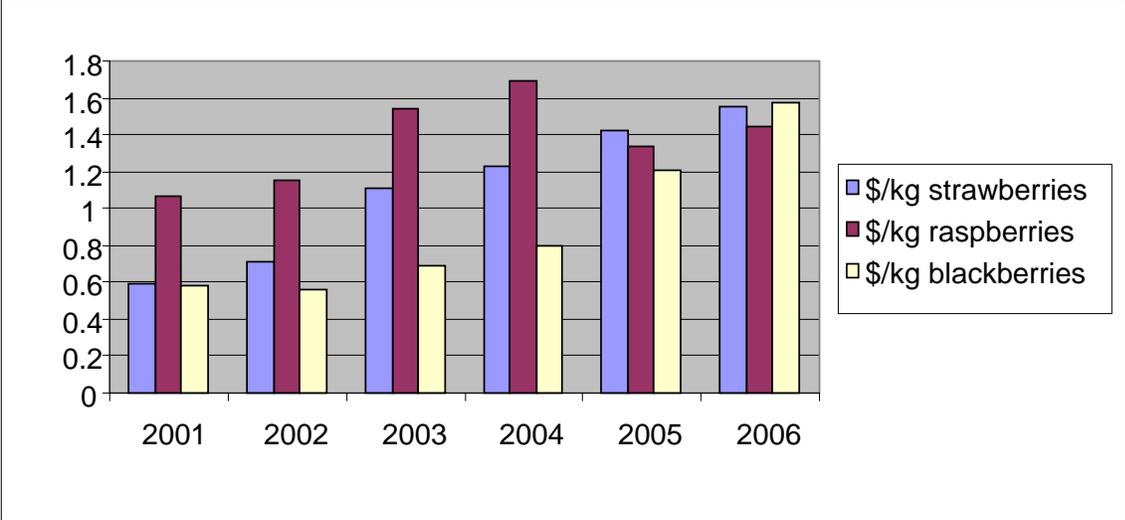


TABLE A1: RASPBERRY EXPORTS IN 2006

	Main markets	Quantity in kg	Share in quantity of total exports (percent)	Share in quantity of production (percent)	Value in U.S. dollars	Export price \$/kg
Production of raspberries		79,700,000				
Total fresh and frozen exports		70,622,403			102,001,830	1.44
Total frozen exports		64,990,233	92.02	81.54	96,313,324	1.48
	Top raspberry exporters, followed by U.S. and Russia	Germany	17,373,905		26,512,007	1.53
		France	14,079,151		20,799,702	1.48
		UK	3,488,759		6,762,862	1.94
		Austria	10,739,871		12,535,887	1.17
		US	110,509		2,94,959	2.67
		Russia	237,038		221,206	0.93
	Raspberries, roland	24,362,089	34.5	30.57	48,106,829	1.97
		Germany	7,937,801		15,079,783	1.9
		France	3,729,029		7,833,135	2.1
		UK	2,475,259		5,390,490	2.18
		US	110,509		294,959	2.67
		Russia	105,644		123,537	1.17
	Raspberries, griese	25,431,000	36.01	31.91	29,993,554	1.18
		France	8,089,922		10,078,307	1.25
		Germany	4,820,974		5,434,211	1.13
		Austria	4,691,757		4,905,191	1.05
		Russia	68,888		58,321	1.72
	Raspberries, frozen, block, and other	15,197,144	21.52	19.07	18,212,941	1.20
Total fresh exports	Raspberries, pre-cooled	5,632,170	7.975	7.067	5,688,506	1.01
		Austria	2,982,751		3,007,834	1.01
		Germany	718,739		674,999	0.94
		Italy	680,887		666,680	0.98
		Holland	633,453		659,186	1.04
		Slovenia	1,900		6,100	3.21
		France	64		529	8.27

FIGURE A6: BLACKBERRY EXPORTS IN QUANTITIES AND VALUES (2001–2006)

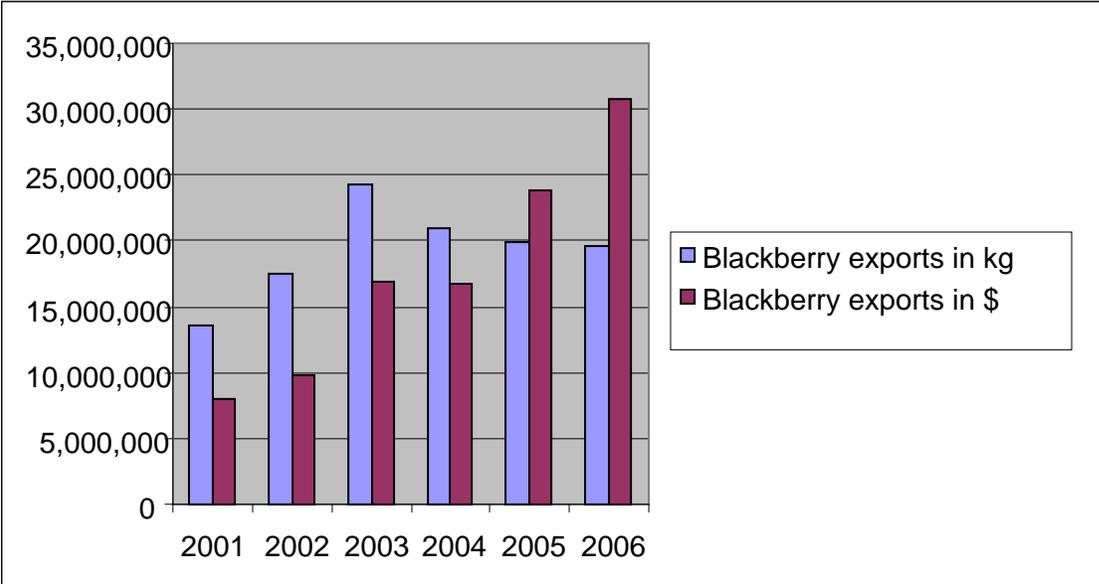


TABLE A2: BLACKBERRY EXPORTS IN 2006

	Main markets	Quantity in kg	Share in quantity of total exports (percent)	Share in quantity of production (percent)	Value in U.S. dollars	Export price \$/kg	
Production of blackberries (approximate)		32,000,000					
Total fresh and frozen exports		19,615,009		61.29	30,845,817	1.57	
Total frozen exports		16,925,507	86.28	52.41	26,987,127	1.59	
	Top foreign markets	Germany	4,635,464		7,368,756	1.58	
		Austria	2,554,354		3,490,691	1.36	
		Holland	2,131,547		3,269,175	1.53	
		France	1,054,701		1,820,021	1.72	
		US	362,908		646,501	1.78	
		Russia	190,000		305,069	1.60	
	Blackberries, roland		13,624,178	69.45	42.57	23,106,080	1.69
		Germany	3,706,993			6,221,061	1.67
		Austria	1,673,775			2,516,491	1.50
		Holland	1,681,692			2,758,552	1.64
		US	306,704			575,205	1.87
		Russia	163,500			267,867	1.63
	Blackberries, block		2,769,794	14.12	8.65	3,135,733	1.13
		Austria	780,579			831,152	1.06
		Germany	837,711			875,233	1.04
		Belgium	465,048			617,937	1.32
		US	21,008			27,967	1.33
	Blackberries, confiture (jam)		345,971	1.76	1.08	528,071	1.52
		Germany	130,917			212,864	1.62
		Austria	100,000			143,048	1.43
		France	30,060			41,354	1.37
US		15,190			16,508	1.08	
Blackberries, frozen and other		185,564	0.94603	0.57	217,243	1.17	
Total fresh exports	Blackberries, pre-cooled		2,689,502	13.71	8.4	3,858,690	1.43
	Austria	1,356,684			1,987,205	1.46	
	Holland	636,047			841,270	1.32	
	Italy	341,652			504,902	1.47	
	Poland	195,382			284,711	1.45	

FIGURE A7: STRAWBERRY EXPORTS IN QUANTITIES AND VALUES (2001–2006)

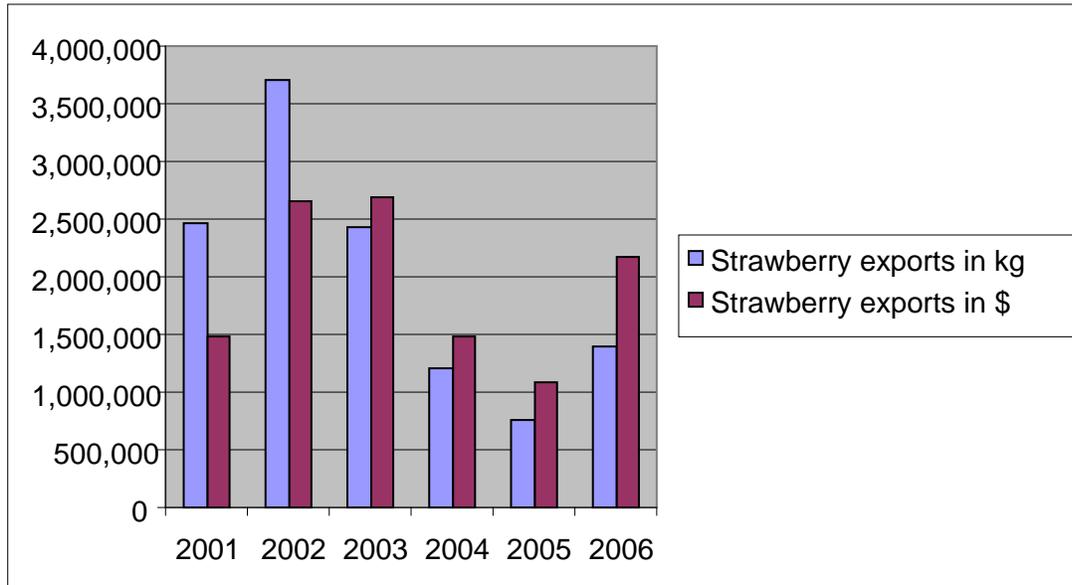


TABLE A3: EXPORTS OF STRAWBERRIES IN 2006

	Main markets	Quantity in kg	Share in quantity of total exports (percent)	Share in quantity of production (percent)	Value In U.S. dollars	Export price \$/kg		
Total production		35,457,000						
Total fresh and frozen exports		1,393,450		3.93	2,166,616	1.55		
Total frozen exports		1,101,481	79.05	3.11	1,874,603	1.70		
	Top foreign markets	Belgium	234,188			439,601	1.88	
		Holland	177,770			286,728	1.61	
		Greece	166,500			297,988	1.79	
		US	150,700			239,918	1.59	
		Germany	115,428			155,393	1.35	
	Strawberries with sugar		384,036	27.56	1.08	727,124	1.89	
			Belgium	234,188			439,601	1.88
			US	70,220			147,936	2.11
			Swiss	40,000			90,087	2.25
	Strawberries without sugar		717,445	51.49	2.02	1,147,479	1.60	
			Greece	166,500			297,988	1.79
			Holland	157,280			261,382	1.66
			Germany	115,428			155,393	1.35
			US	80,480			91,982	1.14
	Total fresh exports	Strawberries, fresh		291,969	20.95	0.82	292,013	1.00
	Fresh		477	0.03	0.00	2,363	4.95	
		France	477			2,363	4.95	
	Pre-cooled		291,492	20.92	0.82	289,650	0.99	
		Russia	214,931			271,050	1.26	
		Romania	76,027			17,280	0.23	

TABLE A4: SUBSECTOR CHANNELS

Item	Quantity, tons	% of total production	Exports in tons	% share in quantity of total exports	Export, millions of y\$	Average export price, \$/kg
Raspberries	79,700	100%	65,000		102.0	1.44
I Processing						
1) <i>Pre-cooled</i>	9,600	12%	5,632	9	5.6	1.00
2) <i>Bulk</i>	61,000	74%	50,800	78	7.6	1.50
3) <i>Retail pack</i>	9,000	11%	8,550	13	18.8	2.20
II Fresh	2,370	3%				
Blackberries	32,000	100%	19,700		30.1	1.57
I Processing						
1) <i>Pre-cooled</i>	14,000	43%	2,700	14	3.8	1.43
2) <i>Bulk</i>	16,000	50%	16,000	81	24	1.50
3) <i>Retail pack</i>	1,000	3.5%	1,000	5	2.3	2.30
II Fresh	1,000	3.5%				
Strawberries	35,500	100%	1,400		2.2	1.55
I Processing						
1) <i>Pre-cooled</i>	30,990	87%	290	20	0.3	1.00
2) <i>Bulk</i>	960	3%	960	68	1.6	1.70
3) <i>Retail pack</i>	150	0.3%	150	12	0.3	2.20
II Fresh	3,400	9.7%				

FIGURE A8: PRODUCTION OF RASPBERRIES (2001–2006)

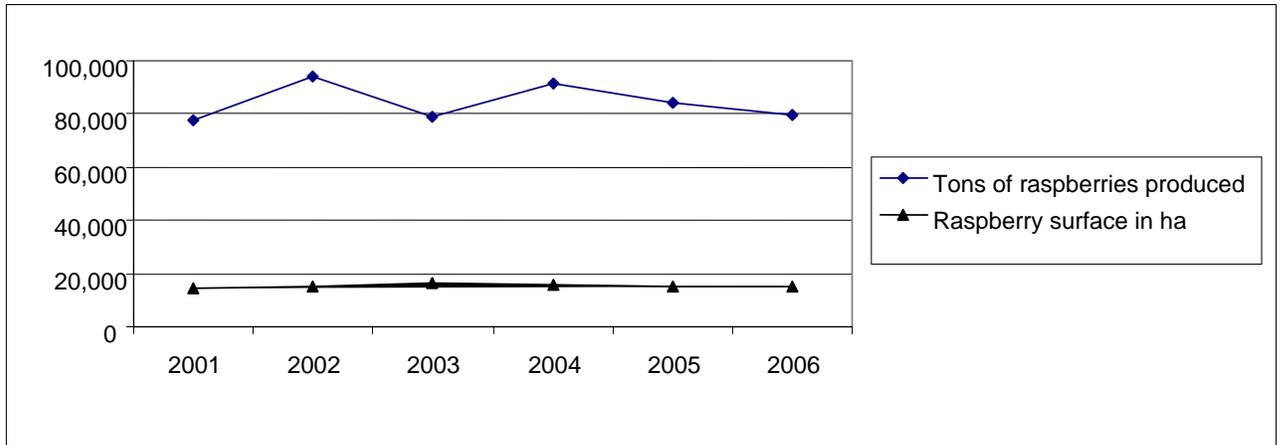


FIGURE A9: PRODUCTION OF BLACKBERRIES (2004–2006)

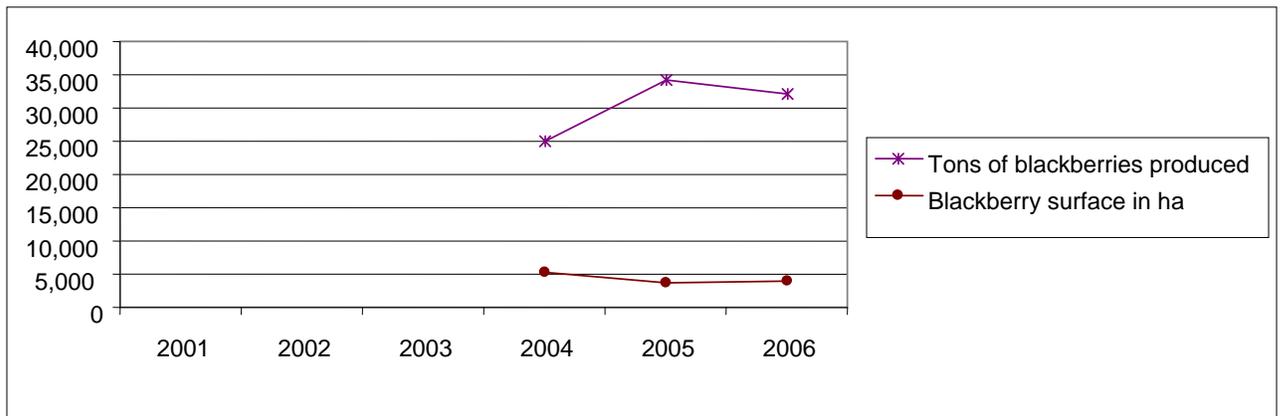


FIGURE A10: PRODUCTION OF STRAWBERRIES (2001–2006)

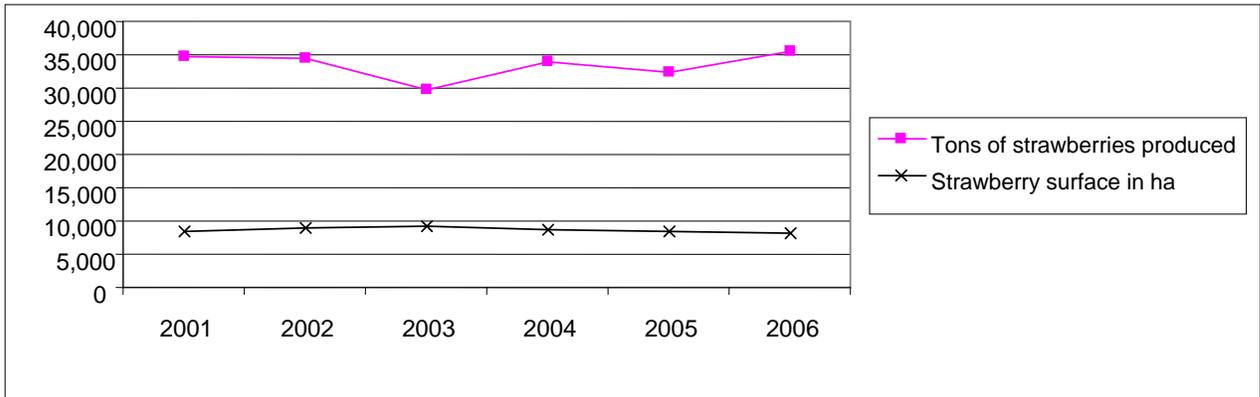


FIGURE A11: PRE-COOLED RASPBERRY CHANNEL

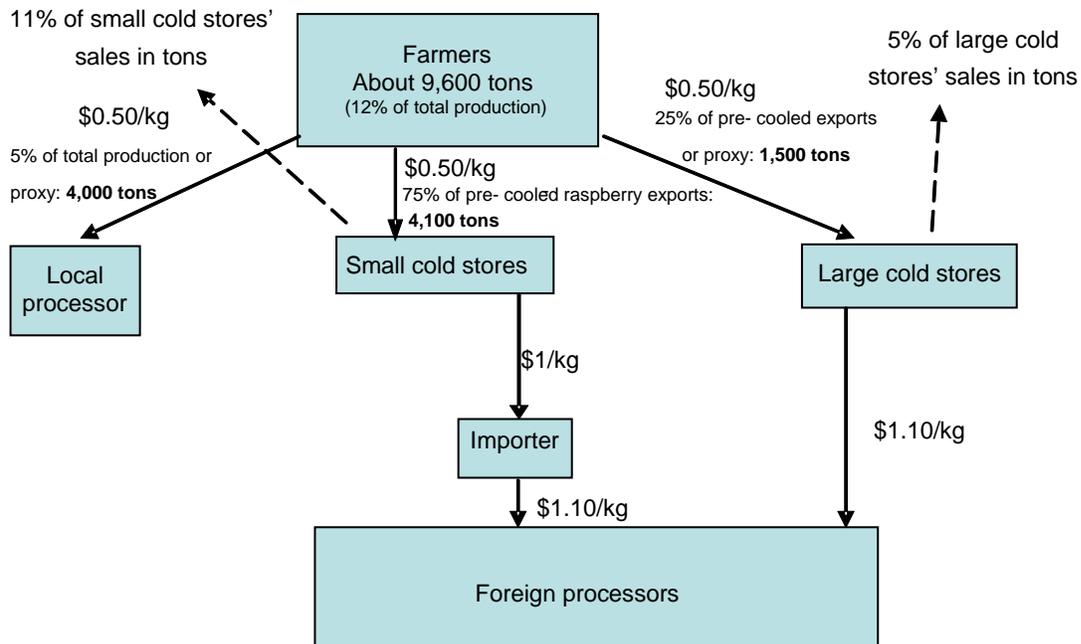


FIGURE A12: BULK FROZEN RASPBERRY CHANNEL

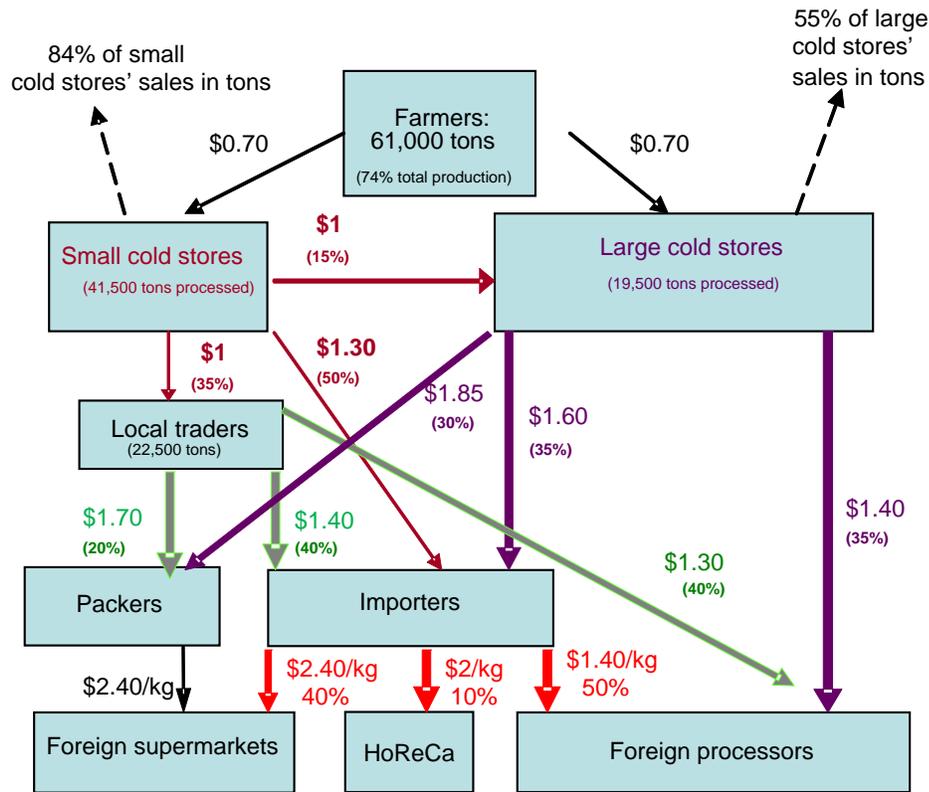


FIGURE A13: FROZEN RASPBERRIES IN RETAIL PACKS

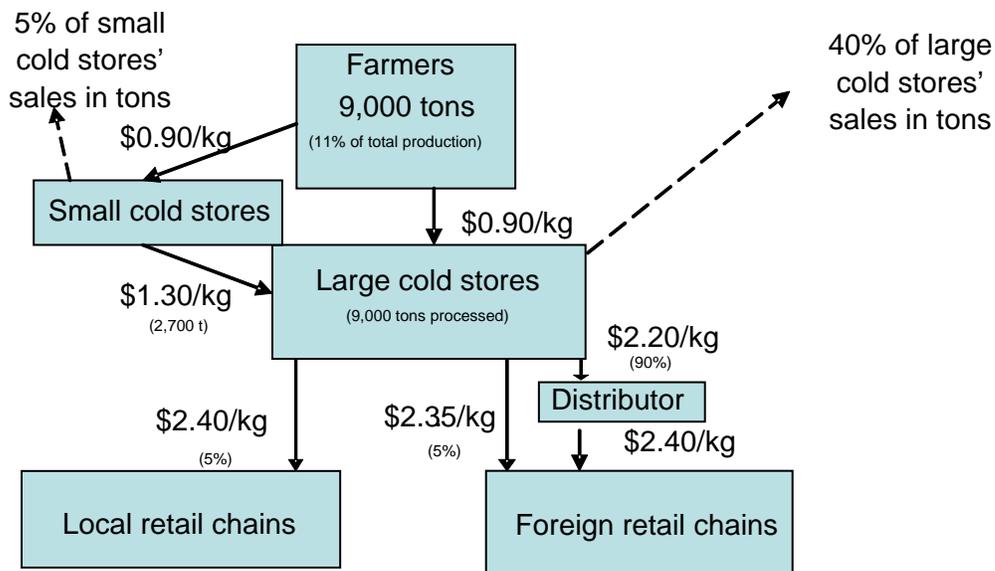


FIGURE A14: FRESH RASPBERRIES

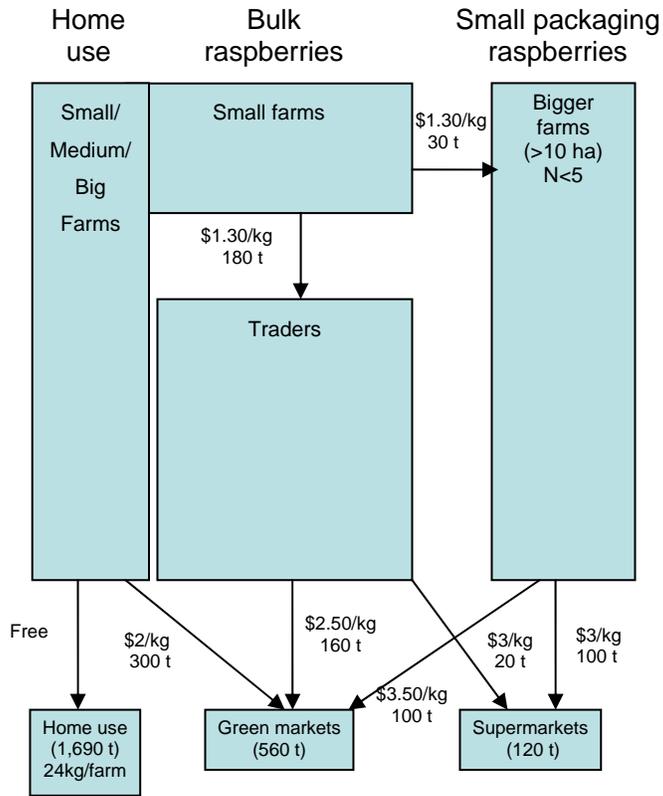


FIGURE A15: PRE-COOLED BLACKBERRIES

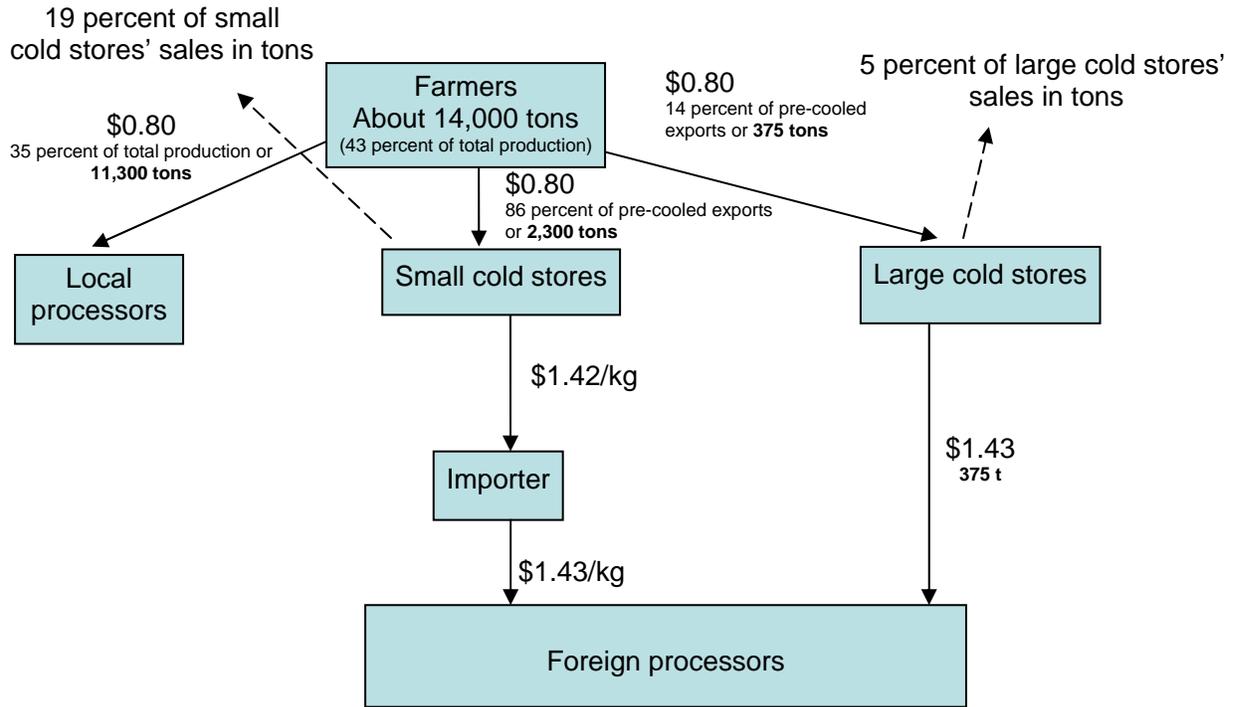


FIGURE A16: FROZEN BLACKBERRIES IN BULK

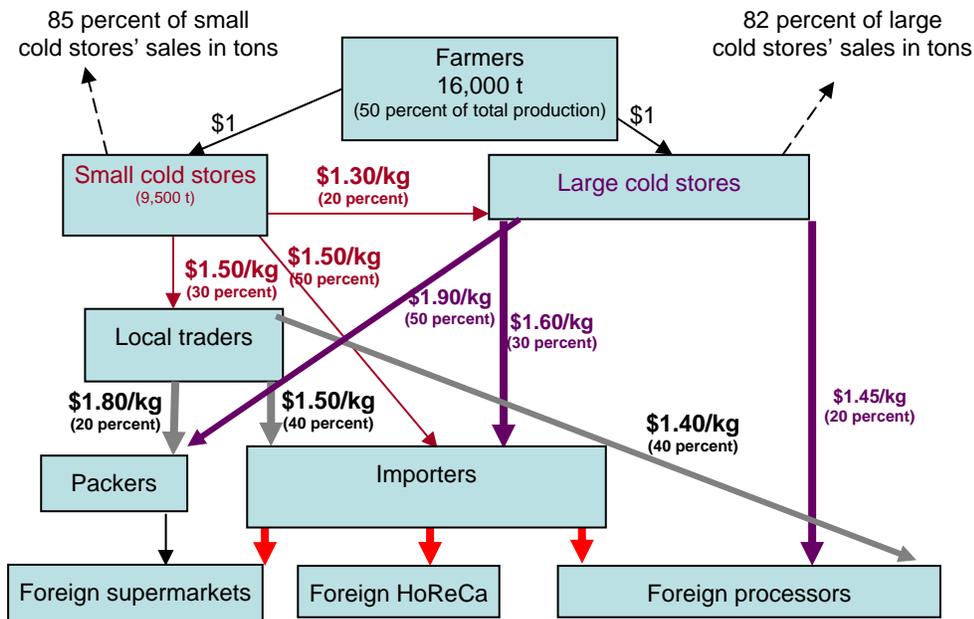


FIGURE A17: FROZEN BLACKBERRIES IN RETAIL PACKS

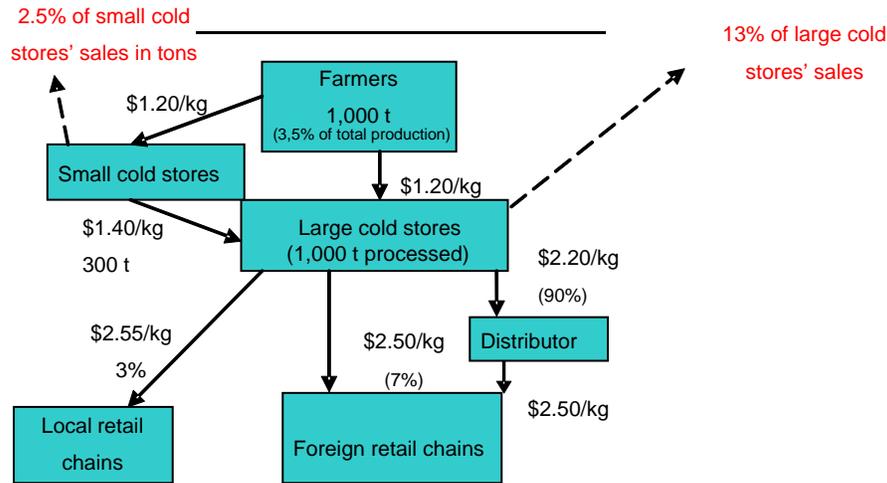


FIGURE A18: VALUE CHAIN FOR FRESH BLACKBERRIES

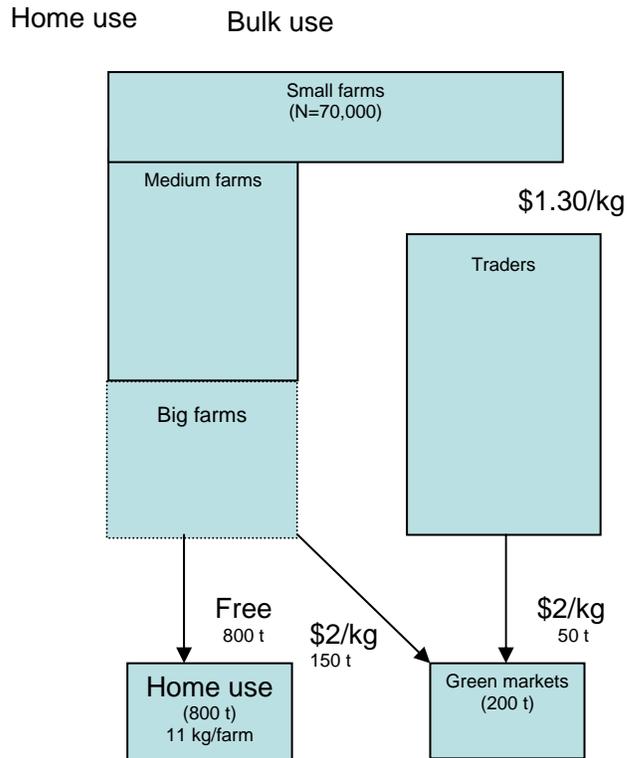


FIGURE A19: PRE-COOLED STRAWBERRIES

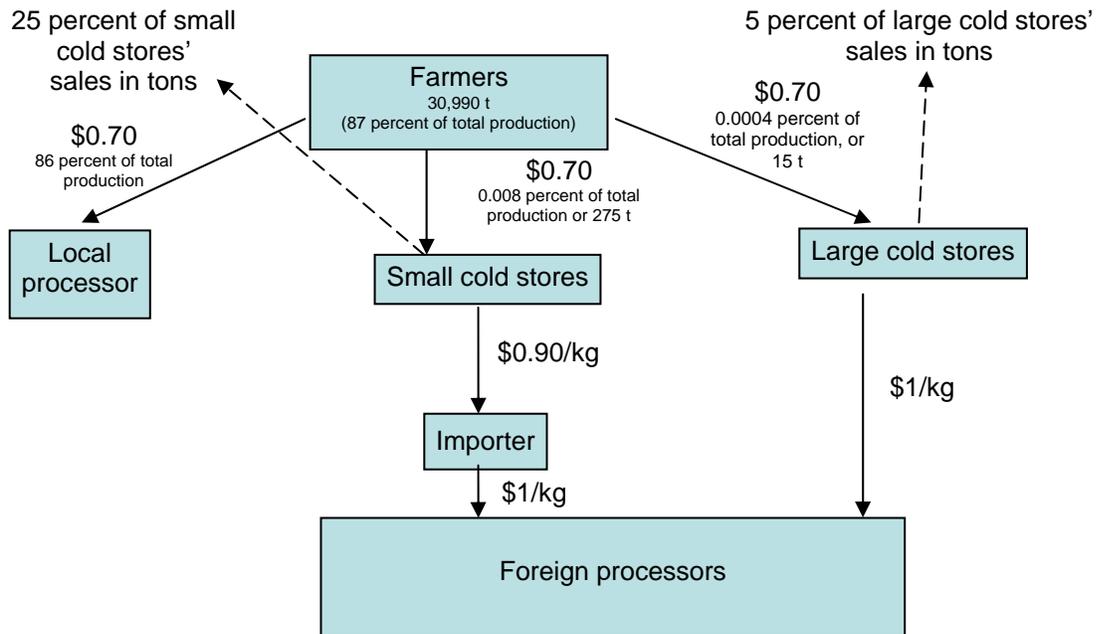


FIGURE A20: FROZEN STRAWBERRIES IN BULK

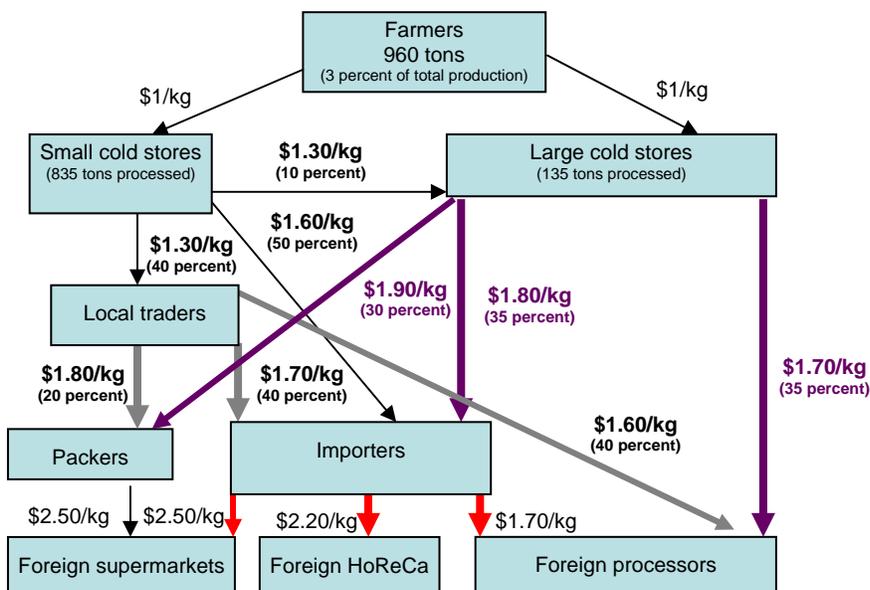


FIGURE A21: FROZEN STRAWBERRIES IN RETAIL PACKS

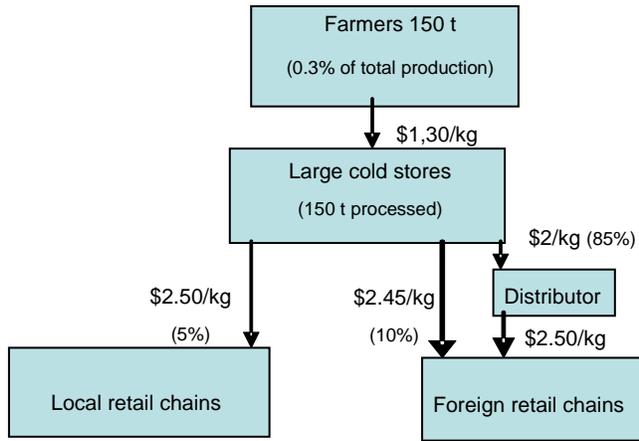


FIGURE A22: FRESH STRAWBERRIES

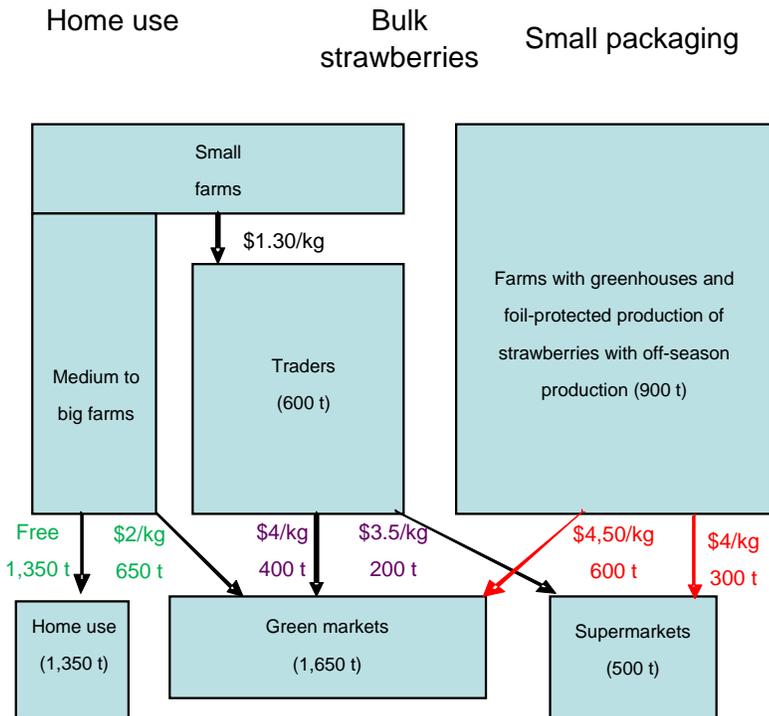


FIGURE A23: FRESH CULTIVATED BLUEBERRIES IN SMALL PACKAGES

