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MARKETING RESEARCH FOR KOSOVO BERRIES PRODUCTION

KOSOVO CLUSTER AND BUSINESS SUPPORT PROJECT



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MARKETING RESEARCH FOR KOSOVO BERRIES PRODUCTION

THIS REPORT DESCRIBES THE RESEARCH CARRIED OUT INTO MERGING EXISTING KOSOVO BERRY PRODUCTION EXPERIENCE WITH HIGH QUALITY MARKET AND MARKETING INFORMATION.

IT MAKES RECOMMENDATIONS ON THE VARIETIES OF RASPBERRIES, BLACKBERRIES AND RED AND BLACK CURRANTS, THAT NOT ONLY GROW WELL IN KOSOVO BUT ALSO HAVE POSITIVE, DEFINABLE INTERNATIONAL SALES OPPORTUNITIES.

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CONTENTS

PURPOSE OF ASSIGNMENT	1
BACKGROUND	1
EXECUTIVE SUMMARY.....	2
RESEARCH FINDINGS TO ACHIEVE PURPOSE	4
CONCLUSIONS AND RECOMMENDATIONS FOR FUTURE ACTIVITY	16
ANNEX.....	18

PURPOSE OF ASSIGNMENT

The purpose of this assignment is to undertake research into merging existing Kosovo berry production experience with high quality market and marketing information. The concluding report will make recommendations to individual farmers, farmers' associations and cooperatives, entrepreneurs with processing facilities, MAFRD and international donors on the varieties of raspberries, blackberries and red and black currants, that not only grow well in Kosovo but also have positive, definable international sales opportunities.

BACKGROUND

KCBS has made, and will continue to make, significant progress in fostering new value chains for Kosovo products, especially berries. This includes not only berries collected from the wild but also cultivated berries. Cold chain facilities, particularly those with capacities for freezing and frozen storage, allow products to be exported anywhere in the world. While the original project momentum in this subject area was focused on stimulating the value chain for blueberries collected from the wild, consultant activities and project grants have resulted in facilities which can be used for a wide array of products. These facilities can form the nexus for stimulating the cultivation of new crops in Kosovo, especially berries such as raspberries, blackberries, and red and black currants.

Raspberries and blackberries have extremely high rates of post-harvest respiration which leads to very rapid deterioration of quality after harvest. For export purposes, these berries need to be frozen within an hour or two after harvest. Rather than planting berries and then constructing a freezing facility, as some development projects advocate, KCBS has implemented a more pragmatic approach creating new, achievable opportunities. Berries can be planted and cultivated near the existing freezing facilities, with the farmers assured that their post-harvest handling problems are already solved. To support the marketing of new berry products, KCBS has decided to conduct an in-depth study to determine what varieties of cultivated berries meet the following three criteria:

- they produce good yields and are not subject to many insect and disease problems;
- they have known uses either as end-products or ingredients; and
- they are in demand in international markets. Varieties that meet these three criteria can then be recommended to farmers for new, profitable farming activities.

The research effort will focus exclusively on the cultivation of raspberries, blackberries and red and black currants.

The Swiss Project for Horticultural Production in Kosovo (SPHPK) has done some berry production work, and they must be consulted. However, SPHPK has not attempted to determine the market potential for any of the berry cultivars in their research.

EXECUTIVE SUMMARY

Raspberries

Raspberry is an important high-value horticultural industry in many European countries because it provides employment directly in agriculture, and indirectly in food processing and confectionary. Most raspberry production is concentrated in the northern and central European countries, although there is an increasing interest in growing raspberries in southern Europe e.g. in Greece, Italy, Portugal and Spain. In many production areas, the fruit is grown for the fresh market, but in central Europe e.g. Poland, Hungary and Serbia, a high proportion of the crop is destined for processing.

Blackberries

Blackberries are a widespread and well known group of several hundred species, native throughout the temperate Northern Hemisphere. The soft fruit is popular for use in desserts, jams, seedless jellies and wine. Worldwide blackberry production was 154,603 tons in 2005, not including production from the wild. There were more than 7,600 hectares of commercially cultivated blackberries in Europe in 2005.

Red and Blackcurrant

The redcurrant is a deciduous shrub native to Western Europe with yellow-green flowers which mature into the bright red berries. The fruit is more sour than the blackcurrant so is more popularly used for jams and jellies than as a fresh fruit. The fruit is popularly used in Scandinavia in juices, fruit soups and desserts and has been used traditionally for its medicinal properties.

Blackcurrants are grown in Northern European member states, with Poland alone representing 70% of EU production. The EU is the world's largest producer; production in third countries is relatively limited and the EU imports negligible quantities of blackcurrant.

Cultivation of berries

From 1990s until recently no one in Kosovo cultivated berries. In 2003 the Swiss Project for Horticultural Promotion in Kosovo (SPHPK) initiated cultivation of raspberries, blackberries and currants through the establishment of two nurseries, one in Gjakova and one Viti. More recently, berries were introduced in Northern Kosovo. In 2005 IOM and Belgian Caritas helped farmers in Leposavic start cultivation of raspberries. These farmers formed in growers association Eko Voce, whose members currently have 3 hectares of raspberries, mainly Willamette and Meeker variety, and they plan to increase it to 5 hectares. An advantage for these farmers is newly established freezing facility with the assistance of KCBS, through a grant donated to the local processor.

The same advantage exist in two other Kosovo regions, Podujeva and Shterpce following grants implemented by KCBS approach, to plant and cultivate berries near the existing freezing facilities so that farmers are assured that their post-harvest handling problems are already solved.

The main producer of raspberries and blackberries in the region is definitely Serbia, which accounts for more than 20% of the world raspberry production.

Annual production of raspberries in Serbia is from 50,000 tons (2007) up to record yields of 93,500 in 2003. This year's drop in production, not only in Serbia, but also in competitive countries, Chile and Poland, resulted in a lack of frozen fruits in world market with subsequent high prices.

Between 90-95 percent of Serbian raspberries are the North American Willamette variety from Oregon. Other raspberry varieties include Meeker, Heritage, Promise and Gradina.

Main varieties of blackberries grown in Serbia include the Thornfree, Cacak Thornfree, Chester and Black Satin.

The United States is the third largest raspberry producer in the world, trailing only Russia and Serbia. Red raspberries from California are sold mostly in the fresh market, while nearly all the product grown in Washington and Oregon is sold for processing. Individually quick frozen (IQF) red raspberries accounted for approximately one-fifth of the processed red raspberries in 2001.

The main US variety is Meeker and it's harvested from mid-June to late August. The vast majority of the berries in US are mechanically harvested.

Characteristics of the World Market for Raspberries

There has been a steady increase in the demand for fruit and fruit-based products worldwide in recent years. While raspberries have benefited from this trend, they compete with a wide range of other fresh and semi-processed fruit on the world market. Total raspberry production is small compared to other fruits. For example, global strawberry production is roughly ten times that of raspberries.

Most traded raspberries are in block frozen form and are treated as a commodity product. In recent years the market has been affected by large increases in production, particularly from low-cost producers and Central and East European countries eager for hard currency. But again, demand for raspberries is increasing year by year.

The biggest exporters are Central and Eastern Europe and Chile, where the majority of production is exported. Other major producers are supplying large domestic markets, and exporting a lower percentage.

Raspberry Price Trends

Pricing for raspberries is different every year. Supply and demand, weather conditions, dollar/euro exchange rates and import duties all have influences on the price. Price fluctuations between one year and the other can be huge.

Fresh raspberry prices are much higher than those of frozen raspberries. Sometimes it can command five times the price of frozen raspberries.

Average price that growers get for fresh raspberries is from 1 to 2 €/kg.

Pricing for frozen raspberries depends on the quality and it can be divided in three categories, as IQF frozen, block frozen, puree quality and juice quality, with prices paid following this sequence from highest for IQF frozen to the lowest prices for juice quality.

Recommended Cultivars

Recommendations are based on three criteria that berry cultivars must meet: 1) they produce good yields and are not subject to many insect and disease problems; 2) they have known uses either as end-products or ingredients; 3) they are in demand by buyers in international markets. (A large table containing these recommendations, on a separate page and suitable for a handout, is found near the end of this report.) The recommended varieties are only for raspberries and blackberries.

Based on the current situation with redcurrant and blackcurrant cultivation in Kosovo and the region and unfavorable market trends, at this time it is not recommended to plant this crop.

RESEARCH FINDINGS TO ACHIEVE PURPOSE

The objective of this research is to merge existing Kosovo berry production experience with high quality market and marketing information.

1.0 RASPBERRIES

There is a legend that the raspberry's scientific name, *Rubus idaeus*, was derived from Mount Ida in Turkey. At that time raspberries were used as a medicine rather than as a food and the berries were not cultivated but wild.

Commercial raspberry production began to increase by the end of the 19th century, when twenty or more cultivars for raspberries were developed in England and the U.S.

Raspberry is an important high-value horticultural industry in many European countries because it provides employment directly in agriculture, and indirectly in food processing and confectionary. Most raspberry production is concentrated in the northern and central European countries, although there is an increasing interest in growing raspberries in southern Europe e.g. in Greece, Italy, Portugal and Spain. In many production areas, the fruit is grown for the fresh market, but in central Europe e.g. Poland, Hungary and Serbia, a high proportion of the crop is destined for processing.

While the sector has a limited economic size in the overall agriculture, it is often concentrated in specific regions in producing countries. Hence it can contribute significantly to a regional economy.

In many countries raspberry production is supported by breeding work at national crop research institutes which have been successful in developing new raspberry varieties with desirable characteristics suited to the local growing conditions and consumer demands. These include improved flavor, yield, disease resistance and nutritional qualities.

There are two types of raspberries, summer-bearing and fall-bearing, also sometimes called ever-bearing. Summer-bearing cultivars grow one year and produce fruit the following year and then cane (the fruit bearing stalk, which may have thorns) dies. Fall-bearing cultivars produce a crop in late summer and the following summer the remaining portion of the cane produces fruit again.

The best land for growing raspberry plants are valleys at 400-800 meters above sea level. Raspberry plants start to yield berries after two years of growth and reach full production in the third year. They can produce at full output for 10 years. Harvest of summer raspberry varieties starts in late June and ends in July, depending on the weather conditions and location of fields. Raspberry plants prefer moderate temperature zones, medium rainfall and maximum temperatures 28-30 °C.

The industry wants raspberries that:

- are naturally resistant to pests and diseases, especially root rot, and thus require few pesticides
- are high yielding
- give more consistent performance i.e. similar yields each year
- are of better quality e.g. with regards to taste and appearance
- have longer growing seasons, thereby attracting higher market prices at “out-of-season” times
- freeze well i.e. do not crumble on freezing and remain in reasonable condition when defrosted again

1.1 Nutritional value of Raspberries

Nutrient	Amount/100g	Recommended Dietary Allowances (RDA)
Water	87 g	
Energy	25kcal	2500kcal (men) 2000kcal (women)
Protein	1.4 g	
Fat	0.3 g	
Carbohydrate	4.6 g	
Glucose	1.9 g	
Fructose	2.4 g	
Fibre	2.5 g	
Folate (Folic Acid)	32 - 33 micrograms	200 micrograms
Vitamin C	24 - 32 milligrams	60 milligrams
Vitamin E	0.48 milligrams	4 milligrams (men) 3 milligrams (women)
Potassium	170 milligrams	3500 milligrams
Iron	0.7 milligrams	8.7 milligrams (men) 14.8 milligrams (women)

Source: *The Composition of Foods (5th Edition)*; Holland

1.2 Raspberry Uses

Raspberry plants have many uses and benefits. Raspberries are used in the jam industry, ice cream, yoghurt, bakery, retail (as fresh) and the juice industry.

The leaves, which are found in groups of three or five, have silver-white undersides and can be used fresh or dried in herbal teas. It is believed that raspberry leaves can be helpful for a sore throat, as well as various stomach ailments, and a tea made with raspberry leaves has been used throughout history to encourage speedy childbirth. Xylitol, an alternative sweetener made from sugar alcohol, is extracted from raspberries. Raspberries also contain polyphenol antioxidants which promote cardiovascular health.

2.0 BLACKBERRIES

Blackberries are a widespread and well known group of several hundred species, native throughout the temperate Northern Hemisphere.

The soft fruit is popular for use in desserts, jams, seedless jellies and wine.

Worldwide blackberry area increased 44% from 1995 to 2005 and was 154,603 tons in 2005, not including berries collected from the wild. There were more than 7,600 hectares of commercially cultivated blackberries in Europe in 2005.

Serbia accounted for 69% (5,245 ha) of the blackberry area in Europe and had the greatest area in the world. Serbia produced 27,557 tons, the fourth highest production in the world, with 90% of their production processed and exported.

Only semi-erect blackberry types were grown in Serbia with the predominant cultivars being Thornfree, Dirksen Thornless, and Smoothstem that produce in July and August. Čačak Thornless, a new cultivar from the Horticulture Institute in Čačak can produce as much as 20

tons/ha and may have individual berries as heavy as 22 g fruit, is being widely planted. Winter cold injury is considered one of the biggest production issues.

Hungary was the next largest producer in Europe with 21% of the total area and 13,227 tons produced in 2005. The Loch Ness variety accounted for 75% of the blackberry area and 90% of the total production was processed and exported. In the United Kingdom and Germany, most of their production is for fresh, domestic use.

In Germany and Romania, Loch Ness is the main cultivar. Area in Poland has doubled in the last ten years. There were 550 tons produced in 2005 with 80% processed and most of this was exported.

In North America there were 7,080 hectares of commercially cultivated blackberries in 2005. The USA accounted for 67% of the area planted to blackberries in North America in 2005 with 4,760 ha, the second highest in the world. Area planted in the USA increased 28% from 1995 to 2005. The USA had the highest production, 35,099 tons, in the world in 2005.

Sixty-five percent of the blackberries cultivated in the USA were planted in Oregon in 2005. The area of blackberries in Oregon increased 25% from 1995 to 2005. Over 95% of the total production of 25,185 tons was processed with the remaining marketed fresh, all for domestic use. Most (95%) of the blackberries in Oregon are trailing types, particularly the cultivars Marion (61%), Boysen (15%), Thornless Evergreen (11%), and Silvan (7%). However, in 2004 and 2005, plant sales of the new thornless 'Black Diamond' were greater than all other cultivars. An estimated 124 ha of semi-erect types were present in Oregon in 2005, mainly Chester Thornless.

Chile had 445 ha of commercial blackberries in 2005 with a total production of 4,275 tons. Area planted increased 50% from 1995 to 2005. In 2004, Chile exported 10,670 tons of processed fruit, including wild blackberries. Their fruiting season is from November to March using trailing, erect, and semi-erect cultivars. Production systems are similar to those in the USA.

2.1 Blackberry Cultivars

Information collected in this study represents 77% of blackberries grown worldwide. On this reported area, 50% of the cultivars were semi-erect, 25% erect, and 25% trailing types in 2005. Thornfree, Loch Ness, and Chester Thornless accounted for 58% of the semi-erect blackberry area and Dirksen Thornless, Hull Thornless, and Smoothstem 28% of the semi-erect. The only other cultivar grown on more than 5% of the worldwide semi-erect area was Čačak Thornless.

2.2 Nutritional Values of Blackberries

Nutrient	Amount/100g	Recommended Dietary Allowances (RDA) of nutrient
Water	85 g	
Energy	25kcal	2000 kcal (women) 2500 kcal (men)
Protein	0.9 g	
Fat	0.2g	
Carbohydrate	5.1 g	
Glucose	2.5 g	
Fructose	2.6 g	
Fibre	3.1 g	
Folate (Folic Acid)	34 micrograms	200 micrograms
Vitamin C	15 milligrams	60 milligrams

Vitamin E	2.37 milligrams	4 milligrams (men) 3 milligrams (women)
Potassium	160 milligrams	3500 milligrams
Iron	0.7 milligrams	8.7 milligrams (men) 14.8 milligrams (women)

Source: *The Composition of Foods (5th Edition)*; Holland

Blackberry is a mineral rich fruit. It is a good source of magnesium and potassium. Blackberry is also a good source of dietary fiber and Vitamin C. Blackberries are excellent antioxidants. Antioxidants in blackberries help to prevent cancer and heart diseases.

3.0 RED AND BLACK CURRANTS

The redcurrant is a deciduous shrub native to Western Europe with yellow-green flowers which mature into the bright red berries. The fruit is more sour than the blackcurrant so is more popularly used for jams and jellies than as a fresh fruit. The fruit is popularly used in Scandinavia in juices, fruit soups and desserts and has been used traditionally for its medicinal properties.

Blackcurrants are almost a forgotten fruit in most American diets. Until April 2003, black currants had been referred to in the United States as the "forbidden fruit," since farming bans in several states prevented it from being harvested, but they are extremely popular in some parts of Europe. Blackcurrants are grown in Northern Europe, with Poland alone representing 70% of EU production. The EU is the world's largest producer. Production in third countries is relatively limited and the EU imports negligible quantities of blackcurrant. Prices of raw material and semi-processed products have collapsed since 2003 due to an increase of production of blackcurrants from almost 150 000 tons on average in 1998–2002 to 200 000 tons in 2003 and 2004. Production has reached record levels while consumption of the final food products (mainly fruit-based drinks) has not shown a similar dynamism and prospects for exports outside the EU are rather limited.

The reasons stated above plus recent bad results with currants in demo plots in Kosovo and the lack of cultivation in the region brings us to a conclusion that currently it's not profitable to cultivate this crop.

3.1 Nutritional Values of Currants

Redcurrant nutritional information

Nutrient	Amount/100g	Recommended Dietary Allowances (RDA)
Water	82.8 g	
Energy	21 kcal	2000 kcal (women) 2500 kcal (men)
Protein	1.1 g	
Fat		
Carbohydrate	4.4 g	
Glucose	1.7 g	
Fructose	2.6 g	
Fibre	3.4 g	
Folate (Folic Acid)	-	200 micrograms
Vitamin C	40 milligrams	60 milligrams

Vitamin E	0.1 milligrams	4 milligrams (men) 3 milligrams (women)
Potassium	280 milligrams	3500 milligrams
Iron	1.2 milligrams	8.7 milligrams (men) 14.8 milligrams (women)

Blackcurrant nutritional information

Nutrient	Amount/100g	Recommended Dietary Allowances (RDA)
Water	77.4 g	
Energy	28 kcal	2000 kcal (women) 2500 kcal (men)
Protein	0.9 g	
Fat		
Carbohydrate	6.6 g	
Glucose	3 g	
Fructose	3.4 g	
Fibre	3.6 g	
Folate (Folic Acid)	-	200 micrograms
Vitamin C	200 milligrams	60 milligrams
Vitamin E	1 milligrams	4 milligrams (men) 3 milligrams (women)
Potassium	370 milligrams	3500 milligrams
Iron	1.3 milligrams	8.7 milligrams (men) 14.8 milligrams (women)

Source: *The Composition of Foods (5th Edition)*; Holland

Blackcurrants have high levels of antioxidants, which have been shown to have significant health benefits. Studies show that antioxidants can prevent various types of degenerative diseases, such as heart disease and cancer, as well as slow down the aging process and protect the body's vision and neurological functions.

Until now, blueberries have long been regarded as the "king of antioxidants." Research has shown that the black currant has a much higher source of antioxidants than the blueberry and has three times the amount of Vitamin C found in oranges. Black currants also contain significant amounts of vitamin B6, vitamin E, potassium, copper and soluble fiber. They are rich in phytochemicals called *anthocyanins* which are known for their outstanding anti-inflammatory benefits. Anthocyanins are the plant pigments that give black currants their dark color - the darker the fruit, the higher the amount of anthocyanin and the more antioxidant benefits available.

Having in mind increased demand in international markets and higher profitability growing raspberries, plus the lack of market data for blackberries and currants this research is focused more on cultivation and marketing opportunities for raspberries.

4.0 CULTIVATION OF BERRIES

4.1 Cultivation of berries in Kosovo

In Kosovo cultivation of raspberries started during the development of local agro-combinats, especially the ones owned by Gjakova municipality SOEs. These berries were mainly used

for juice processing, with Ereniku as one of the main juice producers in this part of ex-Yugoslavia.

From 1990's until recently Kosovo had no cultivation of such berries. In 2003 SPHPK initiated cultivation of raspberries, blackberries and currants at two nurseries in Gjakova and Viti. Varieties introduced by SPHPK are the following:

- Raspberry varieties (Autumn Bliss, Tulameen, Willamette, Meeker, Glen Moy, Glen Lion, Glen Prosen and Glen Rosa)
- Blackberry varieties (Loch Ness, Chester and Oregon Thornless)
- Red Currant varieties (Jonkheer van Tets, Redlake, Rovada)
- Black Currant varieties (Ben Sarek, Ben Nevis, Ben Lomod)

Based on the current experience with cultivation of these varieties, the most successful ones were Autumn Bliss, Tulameen, Willamette and Meeker.

The average yield from the production of these raspberries is from 12 to 15 tons/ha. The Glen varieties appeared to be very sensitive to diseases.

Regarding the blackberries, all varieties were successful and the average yield was around 20 tons/ha.

Currants were introduced two years ago and the results were very bad, due to unfavorable weather conditions in 2007, very light soil and improper use of manure.

During the recent years berries were introduced in Northern part of Kosovo, too. In 2005 IOM and Belgian Caritas helped the local farmers in Leposavic to start with cultivation of raspberries. These farmers gathered in growers association Eko Voce currently have 3 hectares under raspberry, mainly Willamette and Meeker variety and they plan to increase it to 5 hectares.

An advantage for these farmers is newly established freezing facility with the assistance of USAID's KCBS project, through a grant donated to a local processor.

The same advantages exist in two other Kosovo regions, Podujeva and Shtirpce, also supported by KCBS approach, to plant and cultivate berries near the existing freezing facilities so that farmers are assured that their post-harvest handling problems are already solved.

Until now Kosovar farmers have sold their berries as fresh, in green markets, supermarkets and ice-cream producers. The price they have achieved is in range between 1.00 – 1.30 €/kg.

4.2 Cultivation of berries in the region (Serbia and Bosnia)

Due to the availability of data, the research is focused in cultivation of raspberries in Serbia and Bosnia.

The main producer of raspberries and blackberries in the region is definitely Serbia, which accounts for more than 20% of the world raspberry production.

Between 90-95 percent of Serbian raspberries are the North American Willamette variety from Oregon. Willamette is very good for freezing and has excellent processing characteristics, adequate to the requirements of the main European buyers including Germany, France, Swiss, Sweden and Holland. Meeker is mainly required by French buyers. Other raspberry varieties include Heritage, Promise and Gradina.

The main varieties of blackberries grown in Serbia include the Thornfree, Cacak Thornfree, Chester and Black Satin.

Average raspberry plots in Serbia are very small in size at between 0.05 HA and 1.0 ha. Raspberry farms were usually family owned seasonal businesses, but lately some companies have increased their plots up to 100 hectares. Seasonal workers hired in June

and July (mostly women) labor at harvesting by hand. There is no official system of standardization and classification for fresh berries in Serbia. Thus, farmers face problems when selling their products to brokers, processors or cold store plants.

Annual production of raspberries in Serbia is from 50,000 tons (2007) up to record yields of 93,500 in 2003. This year's drop in production, not only in Serbia, but also in competitive countries, Chile and Poland resulted in shortages of frozen berries in world market with subsequent increases in prices.

The average raspberry price that growers receive for years is 1.00 €/kg. Depending on the quality exported, exporters receive from 1.30 €/kg for crumble, up to 1.60 – 1.80 for rolend (IQF quality). Price for 2007 rolend was from 2.10 – 2.20 €/kg.

During 2007 average prices for processed blackberries from Serbia were from 0.80 €/kg for block quality up to 1.40 €/kg for IQF quality.

The average yield from the production of raspberries ranges from 8 to 15 tons/ha, or 1.0 – 1.5 kg/m², depending on weather conditions, fertilization, irrigation, crop protection measures and agrarian techniques applied. Yields as high as 24 tons/ha have been reported in Arilje region in Serbia under ideal growing conditions.

Raspberries in Serbia (and Kosovo) are delicate varieties and must be frozen the same day as picked (in 2-3 hours is best) or carefully boxed and chilled by pre-cooling. Serbia uses only 10 – 16% of its raspberry production for domestic consumption, which are sold at open green markets. Roughly 90 – 94% of all output is further processed or frozen and then exported. The Serbian processing industry uses only small quantities of raspberries each year for domestically produced juices, yogurt, jams, and bakery items.

A majority of exported Serbian raspberries (84%) are shipped frozen, while a smaller amount (16%) is exported chilled.

Raspberries in Serbia are classified in four groups when traded:

- 1) **Individual quick frozen (IQF)** raspberries are a top quality product used mainly in cake production. Each berry must be separated, whole, undamaged, without mold, with minimum foreign ingredients and organic ingredients (leaves). The product must be clean, healthy and with a maximum of 5 percent of broken berries.
- 2) **The frozen raspberry block** comes from the remainders of individual quick frozen raspberries (above). Frozen blocks are used mainly in production of fruit juices.
- 3) **Broken fresh raspberries** may be chopped or ground. Raspberries must be clean, healthy, without mold and other foreign ingredients. Broken raspberries are sold mainly to the dairy industry for fruit yogurt.
- 4) **Raspberry mixtures (puree)** which consist of 40 – 50% individual quick frozen raspberries, 20 – 30% chopped raspberries and 20% broken raspberries. Mixtures are prepared according to a buyer's request and usually with a signed contract. Raspberry mixtures are used in bakery items and for jams.

Raspberries are frozen at the temperature of – 40 °C and are stored at temperatures of –18 to – 20 °C. Chilled raspberries are cleaned, prepared and stored at 0 °C. Chilled raspberries are transferred by refrigerated trucks and produce must be delivered to the destination within a maximum of three days or the level of deterioration will be too great. Chilled raspberries are often further processed for juice and concentrates.

Serbia consumes small quantities of raspberries in local fruit juice production and has a very small production of puree (due to the lack of production technologies). Currently EU companies buy Serbian broken and frozen raspberries to produce purees and processed products, which are then re-exported.

Standard packaging for export of IQF frozen raspberries is the five-layer carton box, which contains four plastic bags of 2.5-kg net-weight. Ninety percent of all exported raspberries are packed this way. The remaining 10% of raspberries are packed in small cartons, as fresh produce (boxes of 500, 600 and 800 grams). This packaging is done mainly at the request of

foreign buyers. These buyers usually provide the Serbian firms with the small retail boxes (holding 500, 600 and 800 grams). This packaging material must meet EU environmental and recycling requirements. Foreign companies also provide pre-printed labels for use in EU supermarkets. Serbian firms do not produce packaging material of adequate quality for the EU market due to the lack of machinery and technology.

The situation in Bosnia is very similar to Serbia, but in much smaller amounts.

The main varieties are Willamette and Meeker, but they have started to test some other varieties, like Heritage, Tumalen and Polka.

4.3 Cultivation of berries in other parts of the world

Since the world production of blackberries is described in the previous section, here we'll present production of raspberries in other parts of the world.

The United States is the third largest raspberry producer in the world, trailing only Russia and Serbia. Eighty percent of the U.S. crop is grown in California, Washington and Oregon. Washington state led in US raspberry production during the 1990s. However, increasing acreage and yields almost three times as high as those in Washington brought California into the lead in 2004, with a record harvest of 41,000 tons. Raspberries from California are sold mostly in the fresh market, while nearly all the product grown in Washington and Oregon is sold for processing, with more than 80% of raspberries cultivated in Washington. This is the reason why we chose Washington in later sections, showing the price trends there.

Individually quick frozen (IQF) raspberries accounted for approximately one-fifth of the processed red raspberries in 2001. Raspberries can also be block frozen when the end use of the product does not require the berry to be whole.

The main US product is of Meeker variety and is harvested from mid-June to late August. The vast majority of the berries are mechanically harvested.

One of the biggest raspberry producers is also Chile, which is located in the Southern Hemisphere. Its harvest occurs during the U.S. winter season, so the country's exports of fruits and vegetables are usually considered complementary to U.S. production. In Chile raspberries of the Heritage variety are harvested twice, with the harvest periods covering November to May. Thus the Chilean harvest ends just as the U.S. harvest is about to begin. But the complementary timing of the harvest is less an issue with IQF raspberries because the fruit, once frozen, can be held in cold storage. Chile is still the dominant supplier for winter season berry markets primarily due to their volume and experience. Chile ships 40 percent of its winter fruit volume to U.S. markets and the rest to Europe and Asia. In the berry arena, Chile has concentrated on fresh raspberries but also has significant export of processed raspberries.

Poland represents two thirds of all EU soft fruits produced for the processing industry. In the last years, owing to the increase in production in Poland (from 20,000 tons on average in 1999 – 2002 to 30,000 tons in 2003 – 2004), the share of EU produced frozen raspberries in total EU supply has increased from 20% in 2002 to 31% in 2004.

Poland has succeeded in capturing a sizeable share of the market in the last 10 years and seems poised to further improve its position owing to a number of advantages: tradition in growing raspberries; low labor costs; strong research on cultivar creation and existence of a large semi-processing industrial basis.

5.0 WORLD RASPBERRY PRODUCTION

	(000 tons)				
Country/Year	2001	2002	2003	2004	2005
Russia	140	165	150	170	175
Serbia	78	95	79	92	90

United States	52	52	62	62	62
Poland	45	45	43	42	38
Chile	24	27	37	42	49
Ukraine	19	18	20	25	20
Others	69	67	67	72	7
World	427	468	458	505	441

Source: USDA.

As it can be seen from this table, Russia is the largest producer of raspberries in the world, but almost all of its production is used for the needs of the local market, mainly fresh and it has no influence for raspberry market trends. Russia is followed by Serbia, US, Poland and Chile.

5.1 Characteristics of the World Market for Raspberries

There has been a steady increase in the demand for fruit and fruit-based products worldwide in recent years. While raspberries have benefited from this trend, they compete with a wide range of other fresh and semi-processed fruit on the world market. Total raspberry production is small compared to other fruit. For example, global strawberry production is roughly ten times that of raspberries.

Most traded raspberries are in block frozen form and are treated as a commodity product. In recent years the market has been affected by large increases in production, particularly from low-cost producers and Central and East European countries eager for hard currency. But again, demand for raspberries is increasing year by year.

The biggest exporters are Central and Eastern Europe and Chile, where the majority of production is exported. Other major producers are supplying large domestic markets, and exporting a lower percentage.

5.2 Raspberry price trends

Pricing for raspberries is different every year. Supply and demand, weather conditions, dollar/euro exchange rates and import duties all have influences on the price. Price fluctuations between one year and the other can be huge.

Fresh raspberry prices are much higher than those of frozen raspberries. Sometimes it can command five times the price of frozen raspberries.

Average price that growers get for fresh raspberries is from 1.00 - 2.00 €/kg.

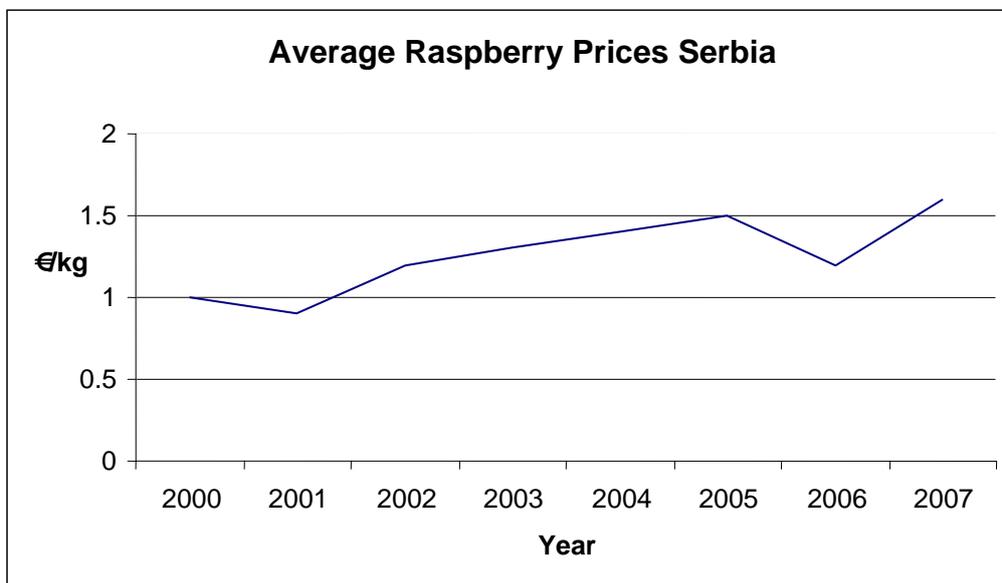
Pricing for frozen raspberries depends on the quality and it can be divided in three categories, as frozen (IQF or block), puree quality and juice quality.

The best prices are paid for frozen, then for puree and the lowest price for juice quality. Juice quality is sold often when the harvesting conditions are poor (rain) and during the peak of the season when the freezing capacity is not sufficient. Since the juice manufacturers are in Western Europe the raspberries need to be pre-cooled to 0 °C and shipped in road tankers. This needs very good planning, since the time between harvesting and arriving to the concentrate plant must never be more than three days.

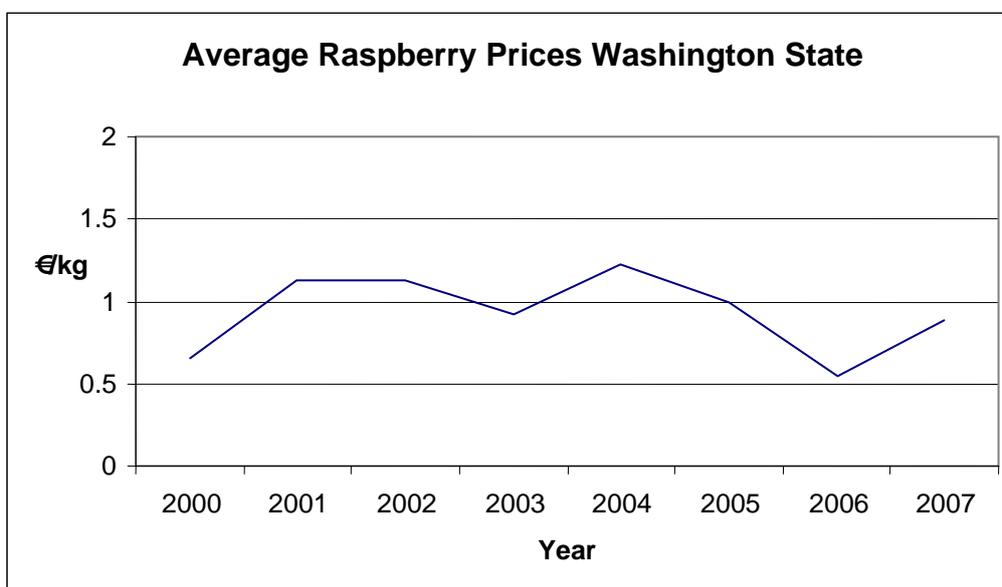
Frozen raspberries are processed again in three categories, being whole, whole and broken and crumble. The processing industry tries always to get an as high a quantity as possible of whole frozen berries.

Below we can see price trends in three main world's producers of raspberries. Prices are for frozen raspberries, dedicated for further processing.

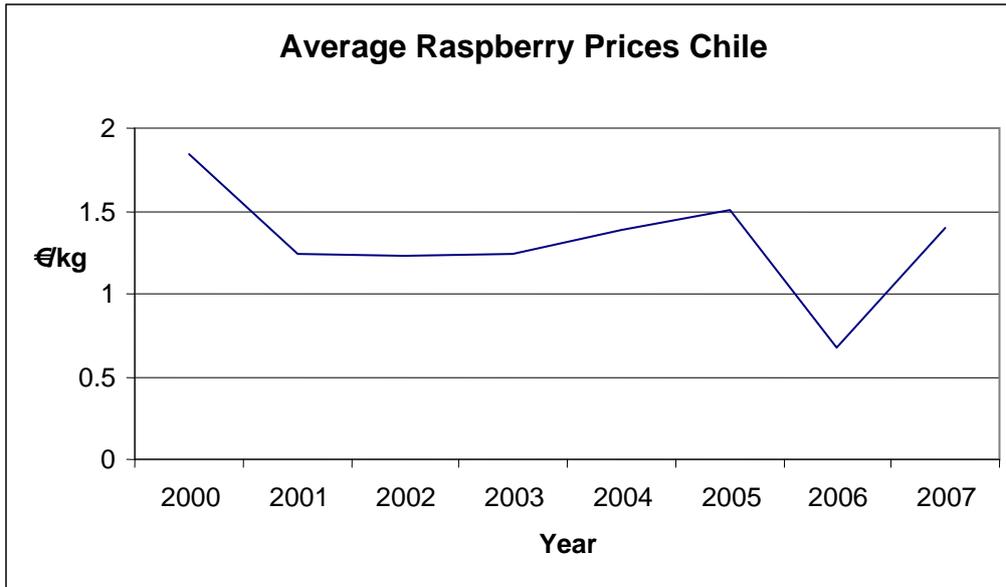
5.3 Raspberry prices in Serbia



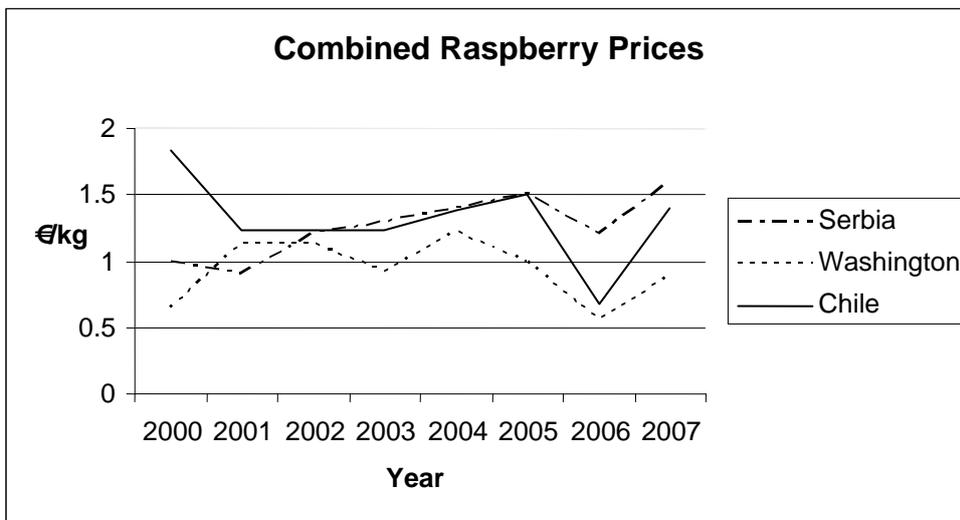
5.4 Raspberry prices in USA



5.5 Raspberry prices in Chile

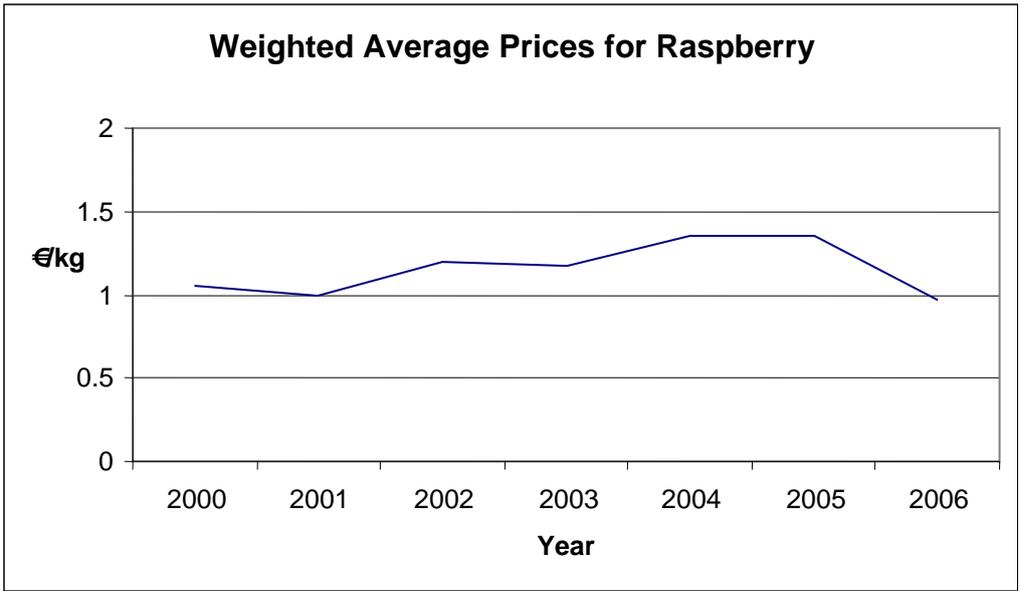


5.6 Price trends for three main raspberry producers



5.7 Weighted Average Prices for three main world producers

Country	2000		2001		2002		2003		2004		2005		2006	
	Weight (t)	€/kg												
Serbia	56000	0.97	78000	0.87	95000	1.22	79000	1.3	92000	1.4	90000	1.5	85000	1.2
Washington	36000	0.65	47000	1.13	47000	1.13	56000	0.92	56000	1.22	56000	0.99	58000	0.55
Chile	22000	1.84	24000	1.24	27000	1.23	37000	1.24	42000	1.39	49000	1.51	54000	1.06
Weighted av.	1.05		1.00		1.20		1.17		1.35		1.35		0.97	



CONCLUSIONS AND RECOMMENDATIONS FOR FUTURE ACTIVITY

The following berry cultivars meet three important criteria: 1) they produce good yields and are not subject to many insect and disease problems; 2) they have known uses either as end-products or ingredients; 3) they are in demand by buyers in international markets.

BERRY	HARVEST SEASON	MARKET
RASPBERRIES Willamette Meeker Tulameen Autumn Bliss Heritage	Summer Summer Summer Fall Fall	Processing Processing Fresh Fresh Processing
BLACKBERRIES Oregon Thornfree Chester Cacak Thornfree Black Satin	Summer Summer Summer Summer	Processing Fresh/Processing Fresh/Processing Fresh/Processing
RED AND BLACKCURRANTS Not recommended at this time		

Producers who want a large crop of good quality fruit in both the summer and fall, should plant both a summer-bearing and a fall-bearing cultivar. This will also spread the risk of crop failure and price fluctuations by conducting sales and receiving income over a longer period of the year.

Characteristics of the recommended raspberry cultivars

Willamette

Summer-bearing cultivar, the most important variety in Serbia, large fruit, dark red color, fairly firm with a fair to good flavor, early season, well suited for canning and juice, ripens early, susceptible to root rot but does not produce well in heavy soils. Suitable for machine harvest, has excellent processing characteristics, required by the main European buyers.

Meeker

Summer-bearing cultivar, fruit is medium to large, medium to dark red, firm, good flavor, mid-season, high to medium yield, suitable for freezing, canning and preserves, later ripening, less susceptible to root rot than Willamette but more susceptible to winter injury than Willamette, resistant to rough handling and transportation, suitable for machine harvest, although long laterals may break. Only recently cultivated in Serbia. Demand for this variety is increasing.

Tulameen

Summer-bearing cultivar, large fruit, firm, attractive, glossy, medium red, sweet, excellent flavor, especially suited for fresh market due to long fruiting season and good post harvest shelf life, suited for processing, can be machine harvested, more susceptible to winter injury than Willamette.

Autumn Bliss

Fall-bearing cultivar, ripens late July through August, fruit is large, but size and quality deteriorate late in season, medium red, good flavor, firm.

Heritage

Fall-bearing cultivar, moderate summer crop with a much higher fall crop, ripens in late August to early September, fruit is medium red, firm, good flavor, excellent quality for freezing, canning and preserves, not adopted for machine harvest.

All of these cultivars have shown good results in Kosovo.

Producers who want a large crop of good quality fruit in both the summer and fall, should plant both a summer-bearing and a fall-bearing cultivar. This will also spread the risk of crop failure and price fluctuations by conducting sales and receiving income over a longer period of the year.

ANNEX

LIST OF CONTACTS/SOURCES OF INFORMATION

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Slobodan Zunic, Libertas Company, Belgrade, Serbia

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Dirk Galama, Fruitraco Holland

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