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Supply Chain Analysis of Fresh Fruit and Vegetables in Germany

by

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1 Introduction

With a population of 82.5 million, the German market is the largest in the EU and therefore of special interest for the trade partners. Despite an unsatisfying economic development in the last years (lowest GDP growth in the EU and rising unemployment, see Table 9 in the annex) Germany is still a very attractive market with well funded consumers. Although agriculture has a small and declining contribution to the country's gross domestic product, in the wider definition of the agribusiness, it is still one of the most important sectors with regard to turnover and employment. Taking consumers' expenditure for food as a proxy for the total turnover of the agribusiness yields a figure of 240 billion € in 2003, nearly as much as the turnover of the car industry in Germany. In total, 4.5 million people are employed in the agribusiness, which is 11.6% of Germany's total labour force.

Among agricultural markets, the market of fruit and vegetables is of special interest for the trade with Mediterranean countries and also of special importance for the food industry and the food consumption. In 2003 consumers' expenditure for fresh fruit and vegetables were more than 10 billion €. The processing industry of fruit and vegetables generated another 6.5 billion € turnover, demonstrating the importance of fruit and vegetables in Germany. Bearing in mind that the self sufficiency ratios for fruit and vegetables in Germany are low (13% respectively 50%), the extent of market opportunities for the Mediterranean countries become obvious.

Against this background it is the objective of this report to analyse the supply chain of fresh fruit and vegetables in Germany. In the second chapter the current market situation is briefly presented with regard to production, consumption and trade in Germany. Other aspects covered in this chapter are the demographic structure in Germany, important consumer trends and food quality issues. The third chapter is devoted in depth to the analysis of the supply chains for both fruit and vegetables. In this chapter the different actors and market channels are described with regard to their task and importance in the supply chain. In the fourth chapter the overall institutional structure is analysed. After the conclusions in the fifth chapter extensive tables and figures can be found in the annex.

2 Market situation

2.1 Market trends

In the last seven years the expenditure for food and in particular for fruit and vegetables in nominal prices remained nearly constant over a six year period. In real prices some differences between vegetables and fruit exist. The prices for vegetables were slightly reduced, whereas for fruit a small increase in the average price level can be observed (see Table 10 in the annex).

The market flatness is also shown in the development of producer prices. As Table 11 in the annex shows, the producer prices in the period of 1997-2003 were in nearly all years below the level of 1995, the only remarkable exemptions being the year 2001 for vegetables and the year 2003 for fruit.

In the following section more information will be given about the production, consumption and trade of fresh fruit and vegetables in Germany.

The overall vegetable production takes place mostly outdoors, whereas tomatoes are produced mainly in greenhouses and account for about a third of the vegetable production under glass[1]. As it can be seen from Table 13 in the annex, asparagus is the vegetable with the highest sales in Germany. Important vegetables for German producer with regard to quantity and value are also carrots, white

[1] For more information see Table 12 in the annex.

cabbage, onions, cucumber and cauliflower. Together with asparagus they account for more than 60% of the quantity and value of the field-grown vegetables in Germany.

The most important fruit produced in Germany are bush berries, apples and strawberries. These three fruit account for nearly 90% of the production quantity and value in Germany (see Table 14 in the annex).

In Table 1 the consumption quantities and values of the most important fresh vegetables are given[2]. According to the statistics from the ZMP, the top 10 vegetables have a share of about 70% of total fresh vegetables consumption and expenditure in Germany (ZMP, 2004 b). The most important vegetable is by far the tomato. It is interesting to note, that the buying ranges of asparagus, mushrooms and lettuce are relatively low, only every second consumer purchase them at least once a year. Examining the development of consumption quantities over time (see Table 16 in the annex) shows, that demand has grown for products like paprika, onions, courgette and chicory, whereas it has fallen for lettuce and cabbages. Compared to 1997, the total consumption of fresh vegetables has increased in 2003 by 3%.

Table 1: Consumption of fresh vegetables in Germany in 2003, per 100 households

Type of vegetable	Buying range in %[1]	Quantity in kg	Expenditure in €	Average price € /kg
Tomatoes	94.9	1,034	2,106	2.04
Paprica	87.0	474	1,260	2.66
Asparagus	48.2	196	864	4.41
Cucumbers	90.2	731	768	1.05
Carrots	83.0	698	532	0.76
Onions	88.5	661	456	0.68
Ice lettuce	67.0	286	362	1.27
Mushrooms	50.6	98	295	3.34
Cauliflower	62.3	241	267	1.11
Lettuce	50.6	111	226	2.04
Total fresh vegetables	**99.5**	**6,266**	**10,392**	**1.70**

[1] Buying range means which proportion of the domestic households have bought the product at least once a year.

Source: ZMP, 2004 b

The demand for fresh fruit is even more concentrated than for vegetables, as the top 10 fruit represent more than 80% of the quantity and value (see Table 2). Especially apples and bananas have an outstanding importance with regard to the fresh fruit consumption in Germany. Among the top 10 consumed products are also typical southern products, such as oranges, mandarins, grapes, nectarines and melons. Compared to 1997, demand has risen for nectarines, grapes, strawberries, lemons and pineapples, whereas it has fallen for bananas and mandarins (see Table 17 in the annex).

[2] Information about the consumption for fruit and vegetables as an aggregate can be found in Table 15 in the annex.

Table 2: Consumption of fresh fruit in Germany in 2003, per 100 households

Type of vegetable	Buying range in %[1]	Quantity in kg	Expenditure in €	Average price € /kg
Apples	95.2	2,187	2,839	1.30
Bananas	95.4	1,826	1,944	1.06
Grapes	84.2	645	1,288	2.00
Oranges	80.2	1,060	901	0.85
Strawberries	72.3	290	801	2.77
Mandarins	85.3	641	745	1.16
Pears	66.8	343	526	1.53
Nectarines	70.2	310	510	1.64
Melons	63.6	470	460	0.98
Kiwis	68.9	193	341	1.76
Total fresh vegetables	**99.6**	**9,107**	**12,555**	**1.38**

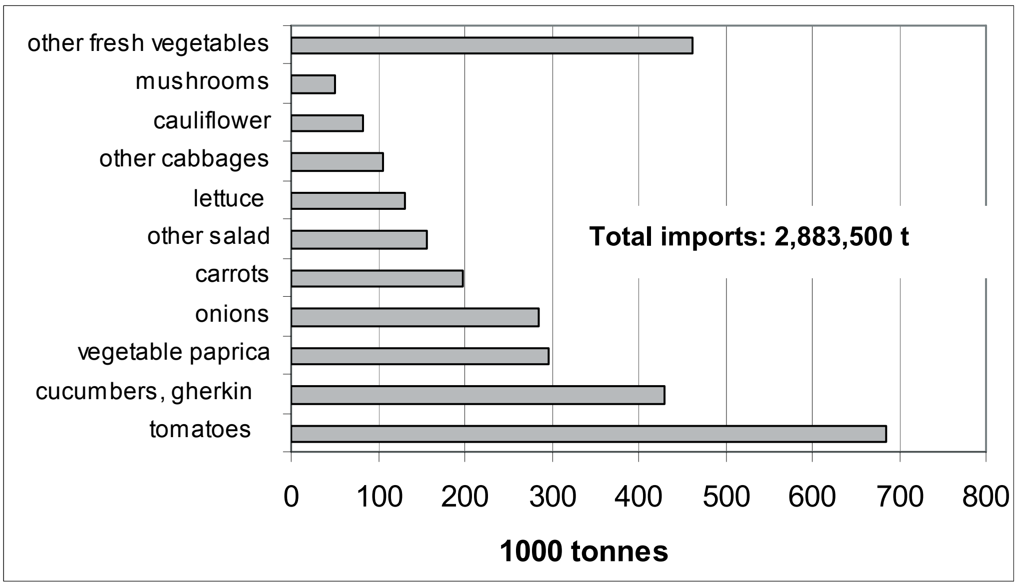
[1] Buying range means which proportion of the domestic households have bought the product at least once a year.

Source: ZMP, 2004 a

With regard to the foreign trade, the most important fresh vegetables (in relation to quantities) exported from Germany are by far the various kinds of cabbages, onions and cucumbers, whereas tomatoes, other salads, carrots and cauliflower are of medium importance (see Figure 9 in the annex). It is worth mentioning that the total quantity of fresh vegetables exports has more than doubled during the last six years. The increase in quantity has been especially large for onions, cucumber, tomatoes, other salads and other fresh vegetables (see also Table 18 in the annex).

Turning to fruits, apples account for about 20% of the total exported quantities of fresh fruit during the period 1997-2002 (see Source: ZMP, 2004 b, Figure 10 and Table 19 in the annex). It is worth to be noted that more than half of Germany's fresh fruit exports are southern fruit, like citrus fruit, melons, peaches and nectarines and other southern fruit. Obviously these figures are re-exports since none of these commodities is produced in the country.

Figure 1: Most important import products of fresh vegetables, Germany 2002[1]



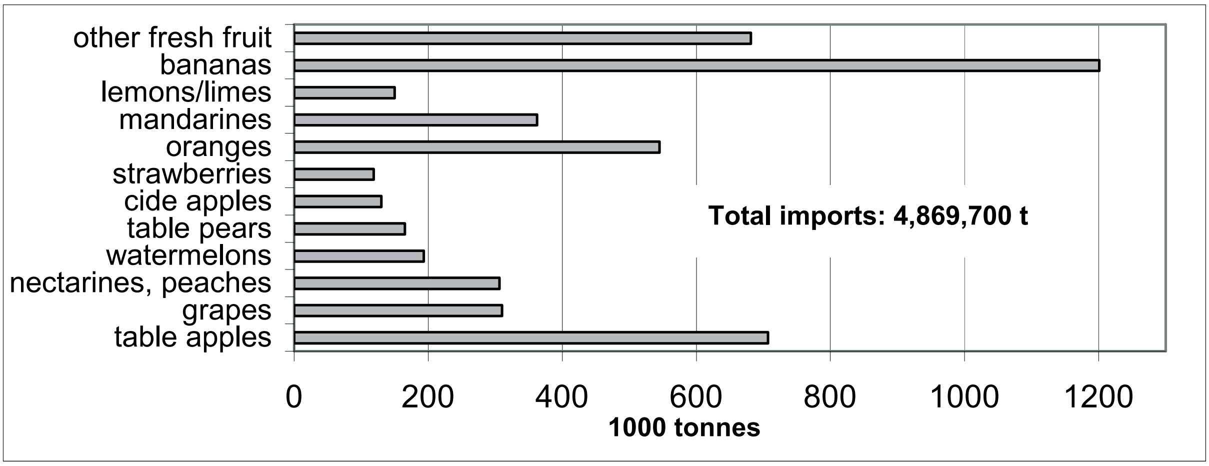
[1] The above mentioned figures do include re-exports.

Source: ZMP, 2004 b

The German imports of fresh vegetables are shown in Figure 1 (for more details see Table 20 in the annex). Tomatoes account for about 25% of the total quantities of vegetables coming into the country, followed by cucumbers and paprika (about 15 and 10 % of total fresh vegetables imports, respectively).

Looking at the fruit trade, as expected, the imports are dominated by commodities not produced in the country. Among the top 10 imported commodities are bananas (about 24%), the various kinds of citrus fruit (all of them together about 20%), whereas apples are also important with a percentage of about 15% of the quantities of fresh fruit imported into Germany (mostly due to the seasonality) (see Figure 2 and Table 21 in the annex).

Figure 2: Most important import products of fresh fruit, Germany 2002

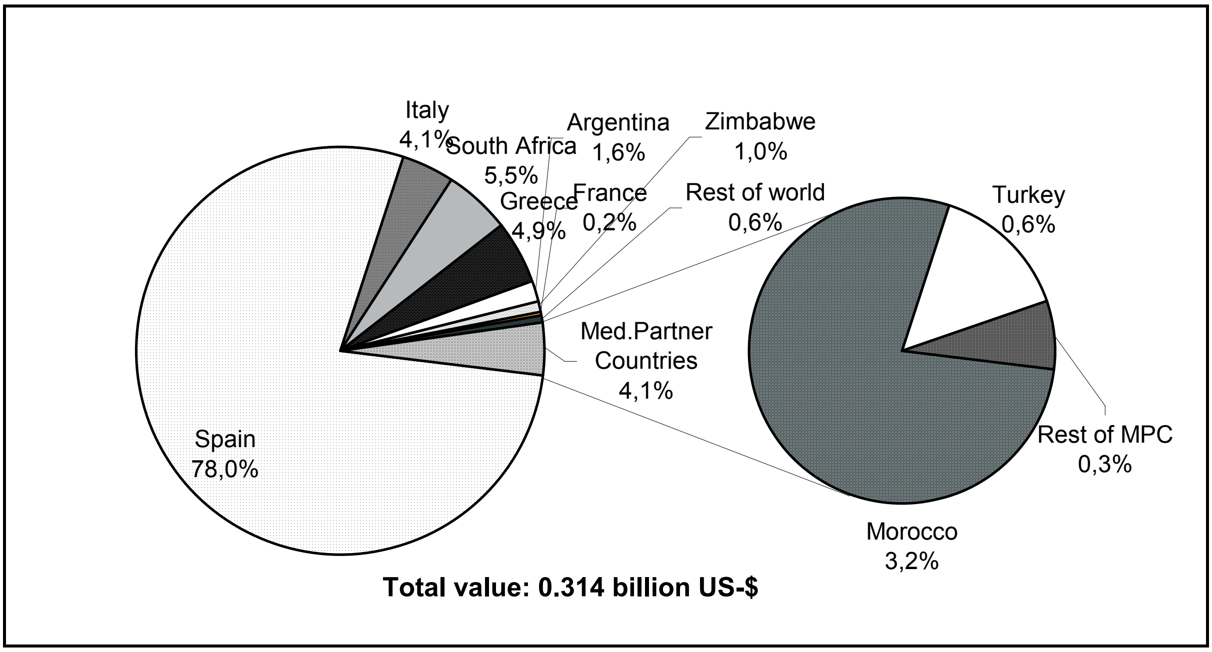


Source: ZMP, 2004 a

In the following section the imports of Mediterranean products like oranges and tomatoes to Germany are analysed in more detail (see Tables 22-27 in the annex).

As for fruit and vegetables in general, the imports with oranges and tomatoes are dominated by intra EU-trade. For tomatoes, the main exporters to Germany are the Netherlands (47%) and Mediterranean countries like Spain (29%) and Italy (9%). The non-EU Mediterranean partner countries cover only 1.7% of the total tomato imports to Germany (see Figure 11 in the annex). Looking at the trade with oranges, the main suppliers are Mediterranean countries with Spain (78%) being the dominant player in the German market (see Figure 3). Some of the Mediterranean products are also re-exported from Germany mainly to other northern EU member-states (see Figures 12-13 and Tables 28-33 in the Annex).

Figure 3: Origin of oranges imported by Germany in 2003



Source: Own composition based on ITC/ PC-TAS

2.2 Changes in the demographic structure

There are three different aspects of the demographic structure in Germany with special interest for the eating habits and therefore for the demand of food.

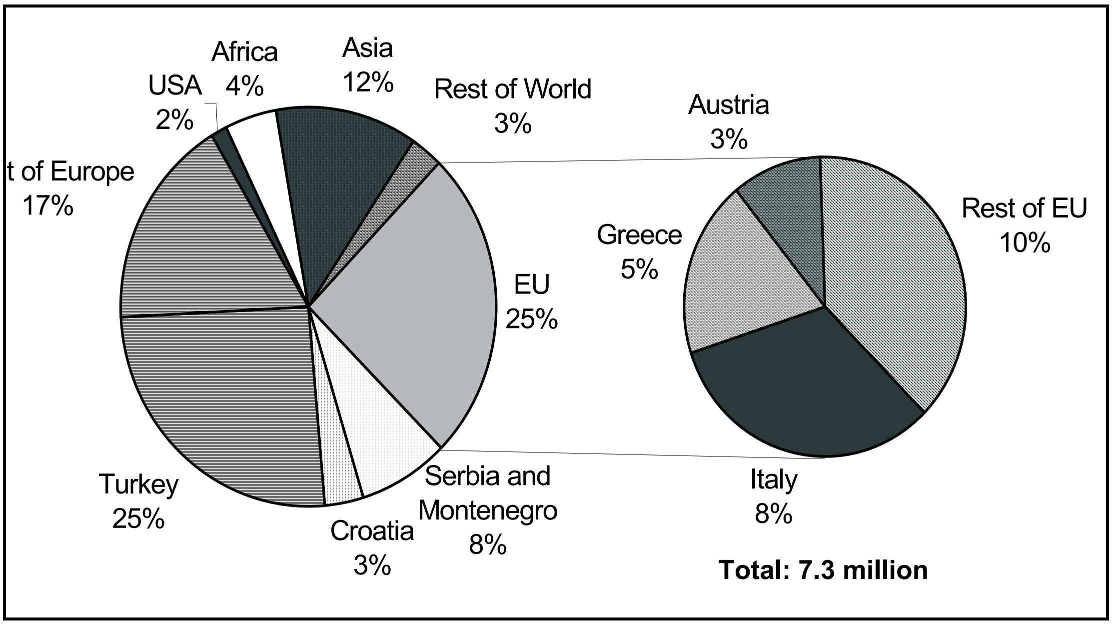
The first aspect is, that Germany has one of the lowest birth rates in the world (1.4 babies per woman) and can be characterised as an aging society with the majority of the population to be between 30 and 60 years old (see Figure 14 in the annex). To this day, the number of young people is gradually decreasing while the number of older people is continuously increasing (see Table 34 in the annex). This is not only a significant challenge for the pension system – especially in the next 20-30 years when the strong birth volumes of the 70s retire, but also for the consumption patterns and eating habits of a society.

Another major demographic trend along with the aging population is the continuous decrease in household size (number of persons per household, see Table 35 in the annex). Most of the households are either a single person household (about 37% of total households) or a 2-person household (34%). In combination with changes in lifestyle this development has and will influence the food demand of the country, enforcing the trend for more processed and convenience food (see Table 35 and Chapter 2.3).

The third special aspect about the demography in Germany is its multicultural diversity with a share of about 9% immigrants (see Figure 4 and Table 34 in the annex).

Figure 4 shows that most of the immigrants come from European countries, with distinguishing part the one of the EU member states (25%). Among them there are about 600,000 Italians (8%) and 350,000 Greeks (5%). Germany was one of the most significant host countries for Turks that immigrated during the 50's and 60's. Today they account for about 25% of the foreign immigrants. 17% come from other European states, 2% from USA and only 21% from other continents, like Asia (12%) or Africa (4%). The immigrants brought with them their eating habits and their traditional kitchen. Their influence in food demand is clearly reflected through the prevalence of a multi-ethnic dishes in the German kitchen and the food services sector. In this regard statistics from the GFK-consumer panel clearly show that foreign households consume on average more and different vegetables (more salads and fruit vegetables, less stem fruits and cabbages) than German households (see Table 37 in the annex). The same is to be expected for fruit, though no official statistics are available.

Figure 4: Immigrants in Germany in 2003



Source: Own composition based on Statistisches Bundesamt, different years

2.3 Consumer trends

In the last 20-30 years the consumers' behaviour towards food consumption has changed from the "traditional" preparation of mainly raw materials in the house to more convenient and quicker ways of food preparation or out of home consumption[3]. This is in direct relationship with the decreasing family size of the German households and changing lifestyle patterns, trends that are generally observed in most industrial countries.

These major trends are reflected in the growing consumption of frozen foods in general (+ 38% compared to 1997) and ready to cook dishes based on vegetables in particular (+ 34% compared to 1997, see Table 35 in the annex). Frozen vegetables account for about 19% of the whole consumed quantity of frozen food, fruit and fruit juices for another 3%. The percentage of frozen ready to cook vegetable dishes is about 35% of the frozen vegetables, with a steadily increasing tendency of about 1% each year over the last six years. Almost half of the frozen food is sold to retail traders and the other half goes to hotels, restaurants and other large scale consumers. The main part of the frozen vegetables (about 63% in 2003) is sold to retail traders, whereas this percentage for the ready to cook vegetable dishes rises to 93%. On the other hand, regarding frozen fruit and fruit juices, they are mostly sold to the food industry (80%).

One of the main driving forces for the consumption of fruit and vegetables are either perceived or real

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3 In the last years the expenditure for out of home consumption were stagnating due to the economic downturn in Germany (see Table 36 in the annex).

health benefits. Generally, fruit and vegetables are regarded as healthy products and have a high appreciation in modern lifestyles. Consequently, it is expected to be a growing market, though seasonal influences (for example a hot summer increases significantly the demand for melons in Germany) are still high.

2.4 Food quality and food safety issues

Due to growing concern of the consumer with regard to food quality and food safety, a number of voluntary quality management and quality assurance systems exist in Germany and are requested from important retailers (see Table 3). Bearing in mind that German consumers are in particular sensitive on food quality issues, the fulfilment of such quality systems will soon become a pre-condition for a successful participation in the supply chain.

Table 3: Mandatory quality assurance systems for the trade with food retailers

Retail enterprise	Distributor, package enterprise	Producer
Aldi	IFS	good agricultural practice
Metro	IFS	EurepGAP
REWE	Q+S	Q+S
Globus	IFS	EurepGAP
Netto	IFS	public requirements
EDEKA	IFS	EurepGAP

Source: SUTOR, 2004

In the following subchapters the different quality assurance systems are described.

2.4.1 DIN EN ISO 9001

This is one of the first quality management systems established and it is restricted to a business or a marketing stage. The main objective is the assurance and documentation of the process quality from the receipts of inputs to the delivery of the products. As business management instruments are applied to achieve a customer or market orientation of the enterprise, the DIN EN ISO 9001 is called a quality management system (ROTHER, 2004, p. 7f).

2.4.2 EurepGAP

This is a horizontal quality assurance system, the abbreviation stands for European Retailer Produce Working Group Good Agricultural Practice. The system defines different standards with regard to production, environmental, social and hygienic aspects. Important criteria which have to be fulfilled are the safeguarding of a flawless production, the reduction of pesticide applications, use of integrated production methods, protection of the natural resources and use of traceability systems of the production. The food retailers generally view the EurepGAP as a minimal standard (ROTHER, 2004, p. 11f).

2.4.3 IFS

Another important horizontal quality assurance system is the IFS (International Food Standard). It was founded in 2001 to develop some international security standards for businesses, which supply the retailers with private brands. The IFS is compatible to the DIN EN ISO 9001 and comprises of the following chapters: 1) requirements for the quality assurance system, 2) responsibility of the business management, 3) management of resources, 4) production process, 5) measurements, analyses and improvements. The auditing is carried out by accredited consultants (ROTHER, 2004, p. 14).

2.4.4 Q+S

This is a vertical quality assurance system which covers all different marketing stages from the harvest of the raw material to the selling at the point of sale. The objective is the complete and continuous quality assurance and information along the supply chain. It involves documentation, production and process requirements. The responsible agency of the QS-system are the CMA and the QS GmbH. Controls are undertaken as a three stage system of own controls, private controls and public controls.

3 The supply chain for fresh fruit and vegetables in Germany

The supply chain of fruit and vegetables is characterised by a large number of participating agents and consequently with a wide range of different distribution channels. In the following chapter the different agents of the supply chain and the importance of their distribution channels will be described in detail (see Figures 5 and 6)[4]. Based on official statistics and other publications, some calculations have been done in order to illustrate the product flow in the supply chain between the different agents. Difficulties regarding data availability in particular for the wholesale level and producer organisation made it necessary to conduct two surveys. The first was carried out under the 127 member companies of the German fruit trade association (DFHV). The questionnaire was returned by 22 wholesale companies. The second survey addressed the 57 member companies of the federal association of producer organisations for fruit and vegetables (Bundes Vereinigung der Erzeugerorganisationen für Obst und Gemüse). So far, 19 producer organisations have returned the questionnaire. The response rates of 17 and 33% respectively do not allow representative conclusions, but give valuable information on both the wholesale trade and the producer organisations.

The chapter is structured according to the position of the different agents in the supply chain. It starts with the inputs for the producers and ends with the final demand of consumers.

3.1 Inputs

At the beginning of the supply chain are the necessary inputs for the production of fruit and vegetables like seed and plants, pesticides, fertilizers, energy, water and services (i.e. insurance, consultation). Farm accountancy data from the farm comparison network of the BMVEL, including 164 vegetable farms and 150 fruit farms, provided useful data on the total expenses for these inputs. The figures for the expenses in € per hectare have been multiplied with the total harvest area and yield the total costs for inputs in the graphical representation of the supply chain[5].

Due to high differences in production intensity, there is a variation regarding the expenses for the cultivation of fruit and vegetables. The cultivation of vegetables is relatively more production intensive and thus requires more inputs. The average expenses per hectare are 8,800 € for vegetables and 2,400 € for fruit. The total expenses for the above mentioned inputs for the cultivation of vegetables is about 940 million €, whereas only 200 million € are needed for the production of fruit.

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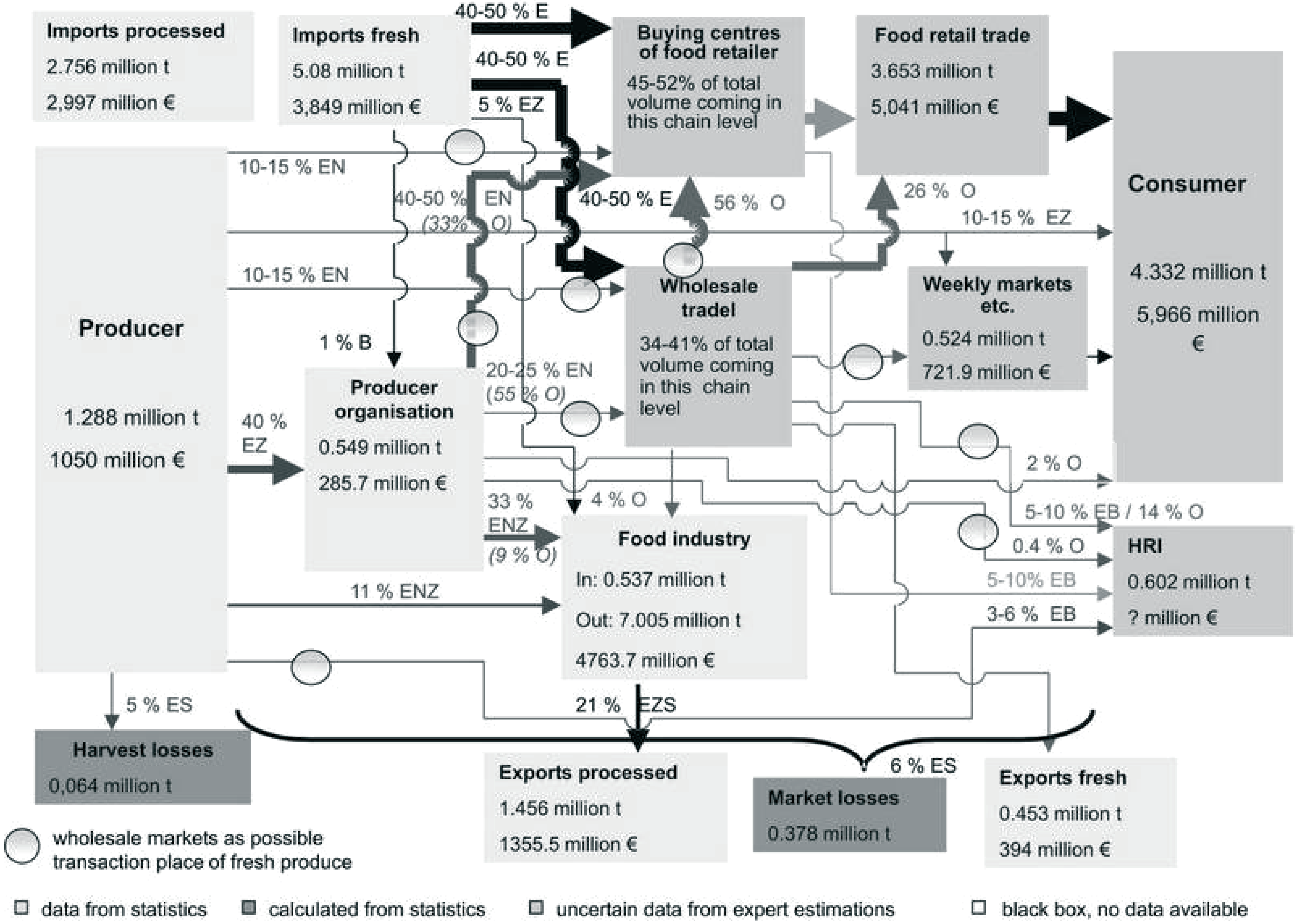
[4] The data needed for the supply chain analysis has been taken from the official statistics (federal ministry of consumer protection, nutrition and agriculture (BMVEL), statistical office of Germany (Statistisches Bundesamt), the Central Market and price information agency (ZMP)) and from private studies.

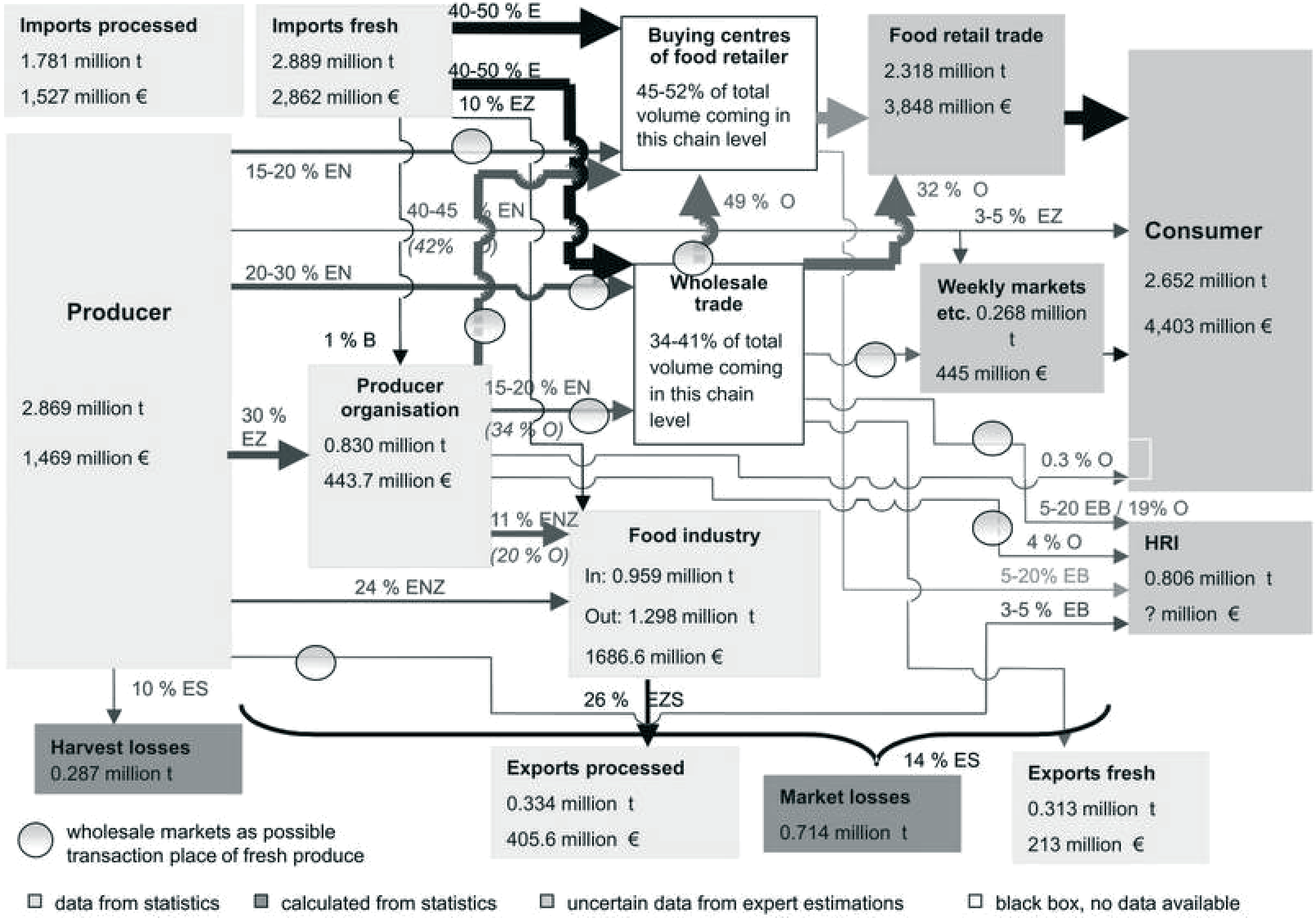
[5] Strawberries are a special case in the official statistics as they are accounted for in the vegetable production. Therefore it was necessary to extract strawberries from the vegetables and assign them to fruit.

Figure 5: Supply chain map for fresh fruit in Germany, 2003



E: own calculations; Z: ZMP Marktbilanz; N: BEL Heft 462; B: Behr/Riemer; S: Stat.Bundesamt: O: own survey
Illustration: Hart, 2005

Figure 6: Supply chain map for fresh vegetables in Germany, 2003



E: own calculations; Z: ZMP Marktbilanz; N: BEL Heft 462; B: Behr/Riemer; S: Stat.Bundesamt: O: own survey
Illustration: Hart, 2005

3.2 Producer

In 2003, 14,000 farms were engaged in the production of fruit in Germany, harvesting a total quantity of nearly 1.3 million tonnes on an area of 84,000 hectares. Total sales were about one billion €. The number of specialised farms in vegetables production is with 2,100 farms much lower, though they yield a total harvest of nearly 2.9 million tonnes on an area of 107,000 ha. Total sales reach nearly 1.5 billion €[6].

Due to harvest losses at the production level, not all of the commercial production of fruit and vegetables enters the supply chain[7]. Using harvest loss percentages from the BMVEL, about 0.064 million tonnes of fruit and 0.287 million tonnes of vegetables are lost at the production level. The remaining production quantity enters the various channels of the supply chain. Possible recipients of the produce are according to NEUMANN the buying centres of food retailers, the wholesale trade, the food industry, producer organisations, large scale consumers and consumers via direct marketing (NEUMANN, 1997, p. 160ff).

The biggest customer for fruit and vegetables at the production level are the producer organisations, accounting for nearly 40% of the domestic production of fruit and 30% of vegetables[8]. The second biggest customer of the producers is the food industry. According to statistics from the ZMP for different fruit[9], an average share of 11% is computed. Consequently about 0.142 million tonnes of fruit are used in the food industry.

For vegetables nevertheless, some official statistics of the share for industrial uses do exist. Every four years the STATISTISCHES BUNDESAMT (2005 c) publishes the amount of vegetable area dedicated for industrial uses, as there normally exist contracts between farmers and the industry. The proportion of area dedicated for industrial uses (24% of the total vegetable growing area) was taken as a proxy for the amount of vegetables entering the processing industry.

Another important distribution channel for the national producer of fresh fruit and vegetables are the wholesale trade and the buying centres of large food retailers. Unfortunately, hardly any data exist on the wholesale sector and only rough estimates can be given. Based on a study of NEUMANN (1997)[10], we used in our supply chain map for fruit a sales volume of 15-20% to the wholesale trade and 10-15% to the buying centres. For vegetables, ranges of 20-30% to the wholesale trade and 15-20% to the buying centres are given.

Direct selling to consumers is another distribution channel of fresh fruit and vegetables. As once again no official data on the sales volumes and values exist, we had to use secondary data from the GFK-

6 It is important to notice, that the total production of fruit and vegetables in Germany is much higher, as the above mentioned figures do not include the small scale production in private gardens.

7 Harvest losses can occur due to quality defects or the decision of the farmer not to harvest. For the computation of the national statistics the German agricultural ministry BMVEL assumes an average harvest loss of 5% for fruit and 10% for vegetables.

8 These percentages were calculated using market data from the ZMP on producer organisations (ZMP a, 2003, p. 58 ff; ZMP b, 2003, p. 56 ff).

9 Unfortunately there are no official statistics to determine the share of fruit for industrial uses. Therefore we had to use the proportion of fresh produce compared to industrial uses from sales statistics of the ZMP on producer organisations (which account only for 40% of the domestic production).

10 The survey of 17 fruit and 16 vegetable producers in the eastern federal states of Germany found an average share of turnover for fruit of 17.7% to the wholesale trade and 7.6% to the buying centres of large food retailers. For vegetables the shares in turnover are noticeably higher (28.1 % to the wholesale trade and 15% to the buying centres).

consumer panel[11]. Nevertheless, using this information we calculated that 12% of the national fruit production and 3% of the national vegetable production is sold directly from the producers to the consumers. These figures correspond favourably with the results of the above mentioned survey from NEUMANN (1997, p. 164f).

No information are available on the sales quantities of fruit and vegetables on local weekly markets.

3.3 Imports

The domestic production is by far not sufficient to meet the demand for fruit and vegetables in Germany. The self sufficiency ratios for 2002/2003 are 20.9% for fresh fruit and 50.1% for fresh vegetables and are much lower than the average ratio for all foods of 96%. Consequently imports of fresh fruit and vegetables are essential to satisfy the domestic demand. In 2003, 5.1 million tonnes of fruit with a value of 3.8 billion € and 2.9 million tonnes of vegetables with a value of 2.9 billion € were imported by Germany. For fruit, the imports exceeded the domestic production by 390% and for vegetables the imports are of the same extent like the domestic production.

Potential recipients of the imported commodities are producer organisations, the food industry and every partner in the wholesale/retail sector. The producer organisations are for both product groups of marginal importance with a maximum of 1% of the imported quantities. This estimation is supported by results from a study of BEHR and RIEMER (1998), who found that producer organisations obtain about 1-8% of their sales volume from imports.

Another minor share of the imported quantity of fruit and vegetables enters the food industry. In total, about 5% of the total fruit imports are intended for industrial uses[12]. For vegetables it is assumed that a range of 5-10% of fresh vegetable imports are for processing[13].

The remaining imported quantities are handled by the wholesale trade or the buying centres of retailers, though no information is available about the distribution between the two channels. Consequently, it is assumed that each channel receives about 40-50% of the total imports.

Not only fresh produce, but also processed fruit and vegetables are imported in large quantities by Germany. In 2003, the imported quantity reached 2.76 million tonnes and 1.78 million tonnes for fruit and vegetables respectively, with values of 2.88 billion € for fruit and 1.53 billion € for vegetables. As the main focus of this study is on fresh produce of fruit and vegetables, no further description of the distribution of processed fruit and vegetables in the supply chain is given.

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[11] According to this established survey on household expenditures, about 3.3% of fresh fruit and 2.4% of fresh vegetables are purchased directly from the producer. Applying these percentages on the total consumption quantity of fresh fruit and vegetables gives us an approximation for the importance of direct selling. As only German households are covered by the GFK-consumer panel, using these percentages for all households in Germany will slightly bias the quantity of direct selling for vegetables as foreign households consume on average about 33% more vegetables than German households (for more information see Table 37 in the Annex).

[12] The quantity of imported fruit for industrial uses, like cider apples and pears, sour cherries, sloes etc is published every year by the STATISTISCHES BUNDESAMT. Additionally soft fruit for processing from eastern Europe were also assigned to this category.

[13] For some vegetables imports like spinach, cornichons or peas, it is known that the imported quantities go to the processing industry. For other products, like white cabbage it is not possible to determine the extent of its industrial usage, therefore the range is of 5-10% is quite broad.

3.4 Producer organisations

After the description of the production and import situation of fresh fruit and vegetables, the remaining stages of the supply chain will be analysed. A starting point are the producer organisations, which are a first marketing stage between producers and wholesale trade.

Table 4: Turnover of producer organisations for fruit and vegetables

Turnover (Mill. €)	Fruit		Vegetables	
	1997	2003	1997	2003
< 1	21	17	11	9
1 to 5	14	10	13	9
5 to 10	4	3	8	7
10 to 20	1	6	7	8
> 20	5	5	4	8
Total	**45**	**41**	**43**	**41**

Source: ZMP, 2004 b

As can be seen from Table 4, there has been an increase in the size of producer organisations over the last six years. The number of producer organisations with less than 5 million € turnover has decreased significantly, whereas the number of producer organisations with more than 5 million € has increased. In 2003, the 41 producer organisations (some active in both fruit and vegetables) in Germany traded on behalf of their members 0.549 million tonnes of fruit (sales value of 286 million €) and 0.830 million tonnes of vegetables (sales value of 444 million €). Important customers of the producer organisations are buying centres of food retailers, wholesale trade, food industry, large scale consumers like hotels and catering enterprises and via direct selling to the consumers. The importance of the different market channels depends on the size of the producer organisation. For small producer organisations with a turnover of less than 20 million, direct selling and big institutional consumers represent 15% of their fruit and vegetables sales, whereas for bigger producer organisations these two market channels account for only 3% of total sales (BEHR and RIEMER, 1998, p. 20f). Our survey on producer organisations supports the lower figure. Only 0.4% of the sales of fruit and 4% for vegetables are supplied to large scale consumers. Sales directly to consumers are only carried out by small producer organisations and the share in total sales volume is less than 1% (see NEUMANN, 1997, p. 228), a number which is also confirmed by our survey results.

According to the ZMP, producer organisations sell about 33% of their fruit sales volume and approximately 11% of their vegetables sales volume to the food industry.

No official data exist on the sales volumes of producer organisations to the different marketing channels such as buying centres of retailers and wholesale trade. Building on the study from NEUMANN (1997)[14], for the purposes of this report it is assumed that for fruit a range of 20-25% and for vegetables of 35-40% enters the wholesale trade from the producer organisations. The study also found out that the buying centres of food retailers appear to be marginally more important for the sales volume of producer organisation (30-40% for fruit and 40-45% for vegetables) than the wholesale trade. Our survey results confirm these figures for vegetables, but they show a different picture for

[14] In a survey of producer organisations in eastern Germany it is shown, that 22% of fruit and 40% of vegetables sales volume went to the wholesale traders. The survey further showed, that another 37% of the sales volume for fruit and 44% for vegetables are acquired by the buying centres of retailers.

fruit. The 16 producer organisation in our survey sell 55% of their produce to the wholesale market and only 33% to the buying centres of the retailers. An explanation for this difference could be the east bias of the survey of NEUMANN (1997), which surveyed exclusively east German producer organisations.

3.5 Food industry

As mentioned before, a significant proportion of fresh fruit and vegetables is further processed in the food industry. For fruit a quantity of 0.537 million tonnes was calculated[15]. After different processing activities a total quantity of 7 million tonnes of processed fruit (canned fruit, fruit juice, jam) is produced with a market value of 4.8 billion € (ZMP a, 2004 a, p. 83 f). The huge increase in quantity is due to the addition of water and sugar during the processing. Using the same calculation procedure for vegetables, it results in a total quantity of 0.959 million tonnes entering the processing industry. The total quantity of processed vegetables like canned vegetables or deep frozen vegetables is 1.3 million tonnes with a market value of 1.7 billion € (ZMP b, 2004 a, p. 82).

Table 5: Turnover classes of the processing industry for fruit and vegetables

	2000			2002		
turnover in Mill. €	number of enterprises	total turn-over (Mill. €)	cumulated turnover (%)	number of enterprises	total turn-over (Mill. €)	cumulated turnover (%)
<1	463	127.7	1.9	470	129.1	1.9
1 - 25	283	1640.6	25.8	• 1)	• 1)	• 1)
25 - 50	20	687.6	35.8	• 1)	• 1)	• 1)
50 - 250	21	2404.1	70.9	20	2146.3	67.2
> 250	5	1997.0	100.0	6	2290.8	100.0
Total	**793**	**6857.0**	**100.0**	**788**	**6981.2**	**100.0**

1 No information available due to the protection of the fiscal secret.
Source: ZMP, 2004 b

In Table 5 the turnover classes of the processing industry are presented for the years 2000 and 2002[16]. It can be seen from the table, that most of the turnover (64%) is achieved by the 46 enterprises with a turnover of more than 25 million €. Although the processing industry is quite concentrated, there are still many small scale processors in the market.

3.6 Exports of processed fruit and vegetables

The export share of the processing industry in Germany for fruit and vegetables is approximately 20%, in which possible re-exports are already included. For 2003, the official statistics in Germany show exports of processed fruit of 1.456 million tonnes with a value of 1.36 billion €. In the same year 0.334 million tonnes of processed vegetables with a value of 0.4 billion € were exported (Statistisches Bundesamt, 2005 a).

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15 For an approximation of the quantities used in the industry we had to add up the sales volumes of the different supplier of fruit and vegetables like producers, producer organisations and imports to the food industry.

16 A list of the fruit and vegetable processing companies in Germany can be found in the Tables 49 and 50 in the annex.

3.7 Wholesale trade and retail trade

After deducting the harvest losses, the quantities for the processing industry and the sales volumes of direct selling from the total supply of fresh fruit and vegetables in Germany (domestic production plus imports minus exports), the remaining quantity enters the trade network of the supply chain and is delivered through different channels to the consumers. It becomes obvious from the graphical representation of the supply chain that the trade partners in the supply chain occupy a central position as a linkage between producers and consumers of fresh fruit and vegetables. Although there exist a number of different trading enterprises (specialised fruit and vegetable wholesale trade, wholesale trade with fresh food, large assortment wholesale trade, large assortment retailers, importers), we restricted our figure to the wholesale trade as an aggregate and the buying centres of retailers. The wholesale trade integrates all the different organisational forms of the fruit and vegetable trading17.

As can be seen in Table 6, in 2002 2,688 wholesale enterprises of fruit, vegetables and potatoes realised a turnover of 16.5 billion € (ZMP b, 2004, p. 22). Compared to the year 2000 the concentration process in the wholesale trade continued. The number of smaller enterprises (with a turnover of less than 25 million €) decreased by 5%, whereas the bigger enterprises increased by 6.3%. Although the bigger enterprises represent only less than 5% of the total number of enterprises, they account for more than 61% of total turnover.

Table 6: Turnover classes of the wholesale trade for fruit and vegetables[1)]

turnover in Mill. €	2000 number of enterprises	2000 total turn-over (Mill. €)	2000 cumulated turnover (%)	2002 number of enterprises	2002 total turn-over (Mill. €)	2002 cumulated turnover (%)
<1	1495	463.3	2.9	1390	422.1	2.6
1 – 25	1201	6179.0	41.4	1172	5973.7	38.7
25 – 50	59	2054.7	54.2	64	2239.9	52.2
50 - 250	56	5302.6	87.3	57	5491.0	85.5
> 250	3	2041.2	100	5	2404.5	100
Total	**2814**	**16040.8**	**100.0**	**2688**	**16531.2**	**100.0**

[1] Potatoes are included in the turnover.

Source: ZMP, 2004 b

In total, 5.08 million tonnes of fruit and 3.38 million tonnes of vegetables have been supplied to the consumer. Customers of the wholesale trade are other wholesale enterprises, including the buying centres of food retailers, the retailer itself, specialist shops for fruit and vegetables and large scale consumers like hotels, restaurants and canteens. At the same time wholesale traders act also as exporters of fresh fruit and vegetables to foreign countries. According to the statistics from the Statistisches Bundesamt, in the year 2003 0.453 million tonnes of fresh fruit with an export value of 394 Mio. € and 0.313 million tonnes of fresh vegetables with an export value of 213 Mio. € were exported (Statistisches Bundesamt, 2005 a).

Market losses during the distribution of the fresh produce do also occur at the wholesale stage and have to be taken into account. Such market losses can be caused by losses during transportation or storage. Using information from Donat (2005), market losses at the wholesale stage of about 0.378 million tonnes for fruit and of 0.714 million tonnes for vegetables18 were calculated.

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17 A list of the fruit and vegetables wholesalers in Germany can be found in Table 47 in the annex.

18 In the case of fruit, official statistics assume market losses of 4 to 10 % of the domestic use (DONAT, 2005). For the calculations here, market losses of 6 % were assumed, since this is the

After deducting exports and market losses, the remaining quantities of fruit and vegetables have to be distributed among the wholesale trade and the buying centres of the retailer. Due to insufficient data availability this needs to be done by rough estimation. However, following the supply chain backwards one can see, that the wholesale trade and the centres of the retailer are supplied with equal shares of fresh produce by the producers, producer organisations and imports. Based on these information it is assumed that the wholesale trade and the buying centres each handle 2.31 million tonnes of fruit and 1.53 million tonnes of vegetables. Nevertheless, according to an expert estimation the wholesale trade and the centres of the retailers are supplied with 34 - 41 % and 45-52 % of fresh produce respectively (Brügger, 2005).

However, the distribution channels of both trade types are quite different. The buying centres of food retailers mainly supply the food retailing and large scale consumers. No data exist on the break down of fruit and vegetables to those two marketing channels. A survey of the Roland-Berger research institute showed, that large scale consumer purchase about 12-20% of their food at the buying centres of retailers. If this percentage is applied on fresh fruit and vegetables, then 5% of fresh fruit and 10% of fresh vegetables handled by the buying centres of retailers are sold to the large scale consumers. The remaining 95% for fruit and 90% for vegetables are delivered to the food retailers.

It is impossible to quantify the market channels for the wholesale trade due to the complexity of the enterprises involved. It is very often the case that the fresh produce changes hands multiple times before it is delivered to the consumers. The importance of the intra wholesale trade is supported by our survey, which finds that approximately 40% of the sales of the wholesale businesses go to other wholesale traders. No official information were available on the marketing channels from the wholesale trade to the buying centres of food retailing, the food retailers, weekly markets or specialised dealers. Based on our survey a rough approximation of the importance of the different channels can be given. For fruit, approximately 56% of the sales of the wholesale traders go to the buying centres of the food retailers, 26% directly to the food retailers, 4% to the food industry and 14% are delivered to the large scale consumers19. For vegetables the respective percentages are 49% for the buying centres of food retailers, 32% for the food retailers and 19% for the large scale consumers. Our results for the large scale consumers are roughly in accordance with the results of the above mentioned study of the Roland-Berger research institute, which estimated the sales volume to large scale consumers at approximately 10% for each product groups.

3.8 Weekly markets, specialised dealers

Weekly markets as well as fruit and vegetable stalls are only of minor importance for the marketing of fruit and vegetables. According to the GFK-consumer panel, the consumers purchase about 12% of their fresh fruit consumption and 10% of their vegetables consumption at these market places. The total sales quantity of these marketing channels is therefore about 0.52 million tonnes of fruit and 0.27 million tonnes of vegetables.

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value for the most important fruit like apples and bananas. In the case of vegetables market losses are even higher. They account for about 15 % of the fresh market sales and 12.5 % of the fresh produce imports (DONAT, 2005).

[19] As we have no information on the destination of the intra wholesale trade, we used the proportion of buying centres to food retailers to reassign the intra wholesale trade to the market channels.

3.9 Food retail

The food retailing has a dominant position in the supply chain of fruit and vegetables[20]. More than 85% of fresh fruit and 87% of fresh vegetables are sold by the food retailers to the consumers (ZMP, 2003, p. 30; ZMP b, 2004, p. 39). This means, that in 2003 a total sales volume of 3.65 million tonnes of fruit and 2.32 million tonnes of vegetables was achieved. The sales value was 5 billion € for fruit and 3.9 billion for vegetables.

Table 7: Number of shops and turnover of important food retailers in Germany, 2003

	Number of shops			Turnover in million €		
	absolute	in %	change to 2000 (%)	absolute	in %	change to 2000 (%)
Tengelmann	3402	5.9	-4.3	8160	8.1	10.1
Metro EH	720	1.2	-8.5	9800	9.7	-0.1
Edeka	11200	19.4	-10.6	24560	24.3	10.4
REWE	7250	12.6	-9.1	21685	21.5	4.3
Spar	5728	9.9	-33.6	9030	8.9	-9.9
Markant	12401	21.5	-9.2	16615	16.5	-4.1
other shops	16999	29.5	-11.8	11050	11	12.6
Total	**57700**	**100.0**	**-13.1**	**100900**	**100**	**3.6**
ALDI	3895	6.3	15	20750	17.1	22.2
Total	**61595**	**100.0**	**-11.7**	**121650**	**100**	**6.3**

Source: A. C. Nielsen, 2004

In Table 7 an overview of the most important food retailers in Germany with regard to number of shops and total turnover is given. It can be seen that Edeka, REWE, Markant and Aldi are the top food retailers regarding their turnover. The concentration process in food retailing becomes obvious from the decreasing number of shops for all food retailers except for Aldi. Tengelmann, Edeka, REWE, Aldi and other shops were able to increase their market share in turnover, whereas Metro, Spar and Markant have lost market shares compared to the year 2003. Unfortunately no information is available on the amount of fruit and vegetables sold by the food retailers. More information about the developments in food retailing can be found in the Tables 40-43 in the annex.

3.10 Consumption

At the end of the supply chain are the 82 million habitants of Germany and the large scale consumers like hotels, restaurants and catering enterprises. According to the information of our supply chain they are offered a supply of fresh fruit of 4.93 million tonnes and of 3.5 million tonnes of fresh vegetables. According to the already mentioned study from the Roland-Berger research institute, 10% of the fruit quantity (or 0.49 million tonnes) and 22% of the vegetable quantity (or 0.76 million tonnes) is delivered to large scale consumers.

The only available data on the turnover of large scale consumers is for food as an aggregate. In 2003 the total turnover of the German Hotel/Restaurant and Foodservice sector (HRI) was 55.5 billion €, of which nearly 2/3 was generated by restaurants and fast food outlets (see Table 8). Due to unfavourable economic conditions there has been a steady decline in total turnover in the last years.

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[20] A list of specialised fruit and vegetable retailers can be found in Table 48 of the annex.

Table 8: Annual turnover (in billion €) in the German Hotel/Restaurant/Food Service Sector

	2001	2002	2003
Hotels	19,4	18,8	18,1
Restaurants & Fast Food Outlets	37,9	35,7	33,5
Canteen &Caterers	4,1	4,0	3,9
Total	**61,4**	**58,5**	**55,5**

Source: RAMOS, 2004

If we concentrate on the food service sector we can distinguish between commercial and institutional food service. The commercial food service sector with a total turnover of nearly 8 billion € can be divided into five key sectors (fast food, travel, retail, full service and leisure). Fast food accounts for 52%, travel for another 23% and the rest in turnover is shared nearly equally by the remaining three sectors. The institutional food service with a total turnover of 2.4 billion € is dominated by caterers in the following segments: company restaurants (54%), hospitals (27%), nursing/retirements homes (12%) and schools/universities (4%). More information about the major companies in each sector and about the top 10 German gastro services are given in the tables 45-47 in the annex.

Using information from the GFK-consumer panel and our supply chain analyses, a total demand for fresh fruit in Germany of 4.33 million tonnes for the consumers and 0.6 million tonnes for the large scale consumers was calculated21. For vegetables the corresponding quantities are 2.65 million tonnes and 0.8 million tonnes.

3.11 Wholesale markets

It can be seen from both maps of the supply chain that many transactions can potentially be made at wholesale markets like the famous ones in Hamburg, Munich or Berlin. At these wholesale markets, the supply (producers, importers, producer organisations, wholesale and retail traders) and demand (traders of weekly markets, specialised fruit and vegetable stores, large scale consumers and branches of food retail) meet physically under one common roof. This provides important information for the players on the market and creates market transparency. In 2003, the total sales volume of the wholesale markets was 4 million tonnes with a sales value of 4 billion €. It has to be kept in mind that these figures also include other commodities like potatoes, fish and flowers. Their share is approximately 25% which leaves a sales volume of 3 million tonnes for fruit and vegetables. According to information from the wholesale markets 60% (1.8 million tonnes) of the sales volume is for fruit and 40% (1.2 million tonnes) for vegetables.

[21] The household consumption of fresh fruit and vegetables is according to the GFK-consumer panel 3.55 million tonnes for fruit and 2.5 million tonnes for vegetables. In addition to the consumption of the large scale consumers this yields a domestic demand of 4 million tonnes for fruit and 3.3 million tonnes for vegetables. Compared to the statistics of our supply chain this leaves a difference of 0.89 million tonnes for fruit and 0.2 million tonnes for vegetables. These quantities are split up to both demand categories (consumers and large scale consumers) according to the shares mentioned in the study of the Roland-Berger research institute.

3.12 Business relationships between the different players in the supply chain

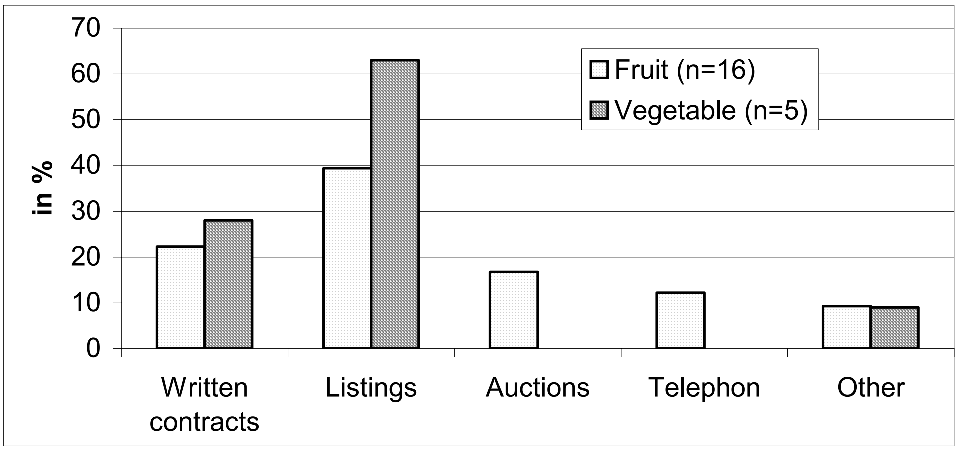
Until now the report concentrated on the trade flow of fresh fruit and vegetables between the different actors in the supply chain. In this part it is tried to be explained how the supply flows are arranged between the different actors in the chain and what kind of business relationships exist amongst them.

Firstly, the business relationships between producers and traders are examined. The increased demand for a quality certification of the products, already requested by many retail trade companies, is of significant importance for the producers. The wholesale and retail trade demands increasingly bigger and more uniform parts of high quality products, which should additionally fulfil product safety issues. For this reason, a stronger cooperation is required between producer themselves and between producers and traders. Existing cooperation examples are harmonised production systems or integrated production forecasts (Bokelmann et al., 1999).

Indeed, especially the knowledge of individual producers about the requested standards by traders is very limited, whereas the situation is better among the producer organisations. Our survey results show, that already 65% of the interviewed producer organisations (23 in total) are certified by EurepGAP or Q+S and 61% according to the IFS. Against this background, horizontal cooperation at the producer level appears to be beneficial for the marketing of fruit and vegetables (Neumann, 1997, p. 260f).

The sales system of fresh produce from the producer to the trader depends mostly on the size of the producer. With an increasing size of the producer enterprise the part of sales through telephone marketing declines, i.e. orders of products made through telephone for well-known clients, whereas the part of products sold through auctions increases (Behr and Riemer, 1998, p. 18f). Moreover, the embodiment of the supply relationship between producers and traders depends on the customer structure. Informal agreements regarding the supply of fresh produce are common between producers and specialised wholesale traders. Listings of fresh produce are the usual form of supply relationship between producers and food retailers. Written agreements on the other hand play only a major role between producers and the food industry (Neumann, 1997, p. 232f). Despite these trends mentioned above, in comparison to other European countries the vertical cooperation is quite less common practice in Germany (Weindlmeier, 2000 , p. 5).

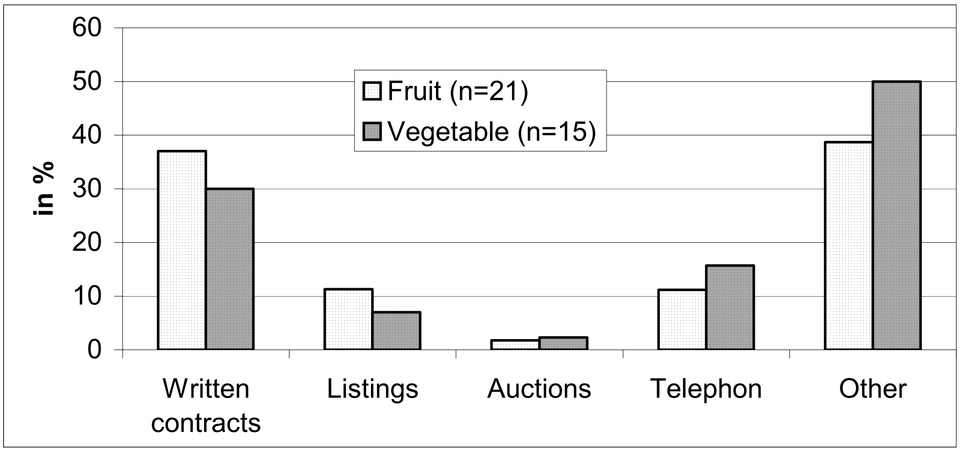
Figure 7: Selling mechanisms of the producer organisations



Source: Results of the own survey, 2005

The results of our survey about the selling mechanisms of producer organisations is depicted in Figure 7. The most important selling mechanism for fruit[22] are listings (39 %), followed by written contracts (22 %), auctions (17 %), telephone (13%) and other mechanisms (9%). These figures generally support the importance of the distribution channels from the producer organisations in the supply chain map. The high percentage of written contracts (22%) suggests that this instrument is not only used for the supply of the food industry (which receives only 9% of the total sale of the producer organisations), but also for other recipients.

Figure 8: Acquisition mechanisms of the wholesale trade



Source: Results of the own survey, 2005

Our survey results on the acquisition mechanisms of the wholesale trade (21 fruit wholesale businesses and 15 vegetable wholesale businesses) show, that nearly 50% of fruit and 37% of vegetables are not purchased on spot markets, but acquired through more formal mechanisms like written contracts and listings (see Figure 8). Auctions and telephone, both typical instruments of the spot market, are only of minor importance (13%-18%) for the interviewed wholesalers. Interestingly, many wholesalers have other acquisition mechanisms than the above mentioned (39%-50%). With regard to quality assurance systems, more than 50% of the wholesalers request from their suppliers a EurepGAP certification, another 31% demand the IFS certification. Until now the German Q+S system is not required by the wholesalers.

Significant changes in the supply relationship between the wholesale trade and the food retailer have occurred in the last years, as the food retailers have begun to centralise their purchasing activities. The food retailer conclude directly (not via the wholesale trade) agreements with efficient fruit and vegetables producer. Thus, wholesale traders are becoming more and more a service provider for logistical issues (Bokelmann, 1999, p. 9). In particular the specialised wholesale trade is regarded as a competent partner due to its combined assortment and logistic know-how (Neumann, 1997, p. 61). As a partner of the food retailer the wholesale trade must be able to guarantee product traceability and the reliability of delivery date. As a consequence of increased coordination requirements between the wholesale trade and the food retailer an extension of the electronic data exchange system is essential (Bokelmann, 1999, p. 29).

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[22] For vegetable the number of observations (n=5) is too small to deduce reliable conclusions.

4 Overall institutional structure

4.1 The role of the government

Germany is organised in 16 Federal States, each of them with its own agricultural ministry and/or agricultural chamber. Responsible for the agricultural sector and the agricultural policy in the country is the Federal Ministry of Consumer Protection, Food and Agriculture (BMVEL). The implementation of the policy and the control of the EU-regulations and guidelines concerning the quality of agricultural products is done both centrally and regionally. In several cases the Federal States and/or chambers have developed their own quality control systems.

Specific quality control programs for fruit and vegetables of the federal states can serve as a possible base for the already mentioned quality system IFS. Examples of how these programs work can be shown through the description of the quality programs of Bavaria (KIP= control integrated production), of Baden-Wuerttemberg (guaranteed quality) and of Lower Saxony (voluntary quality control).

The guidelines for the controlled integrated production were set in the beginning of the 90's by the board of trustees for vegetable production in Bavaria (LKP). For the controls, several characteristics are taken into account such as origin, conditions of cultivation, production technique, harvest, storage, sorting and processing, controls and identification of the farm. The controls for the compliance with the guidelines take place twice per season from personnel of the LKP. For the execution of the control, no contracts are required between the farmers and the traders of the farm products (Rother, 2003).

The quality label "Gesicherte Qualität" of Baden-Wuerttemberg was created in 1989 and provides certification of a) products coming from this region, b) guaranteed quality and sustainable plant production and c) independent controls at all stages of production, processing and marketing. There are different control mechanisms for fruit and vegetables (www.wasliegtnaeher.de).

The program of voluntary control of the agricultural chamber of Lower Saxony was granted with the purpose to establish adequate control mechanisms to corresponding quality norms and regulations for the processing, sorting, packing and labelling of both fresh and industrially processed fruit and vegetables (www.lwk-hannover.de). The program is based on the directives for the grading of goods and includes controls at the different stages of the supply chain (production, distribution). It also offers consulting services for all actors of the supply chain with regard to the production and marketing of fruit and vegetables. The controls are carried out by specially educated controllers, whereas no information is given for the control intervals.

4.2 Sector institutions

As already shown, several actors are involved in each level of the supply chain of fruit and vegetables. In order to facilitate the interests of each actor and to act as representative or to provide them with other services, each level of the supply chain has its own association.

At the level of producer organisations operates the federal association of producer organisations for fruit and vegetables (BVEO) (www.bveo.de). It was founded in 1970 and is responsible for the official representation of its 57 members in Germany and in the European Union. The BVEO supports its members further with consulting services, it is involved in the development of quality guidelines, it is responsible for public relations and coordinates the participation of the producer organisations in international trade fairs. The association is furthermore one of the foundation members of the QS-subsidiary companies for fresh fruit, vegetables and potatoes and supports the "5-a-day"-campaign of the Federal Ministry of Consumer Protection, Food and Agriculture.

The federal association of the processing industry of fruit, vegetables and potatoes (BOGK) acts as a representative of the fruit and vegetables processing industry in the supply chain. The BOGK represents the interest of its members specially towards official authorities, parliaments, the EU, the federal government and the federal states. On a national and European level it also deals with questions of cooperation between the associations and the organisations of the agribusiness. Unfair competition and arrangement of trade disputes between the members due to arbitrational decisions are further areas where the BOGK is active (www.bogk.org).

The German fruit trade association (DFHV) is the official association of a large part of the traders in fruit and vegetables. The member companies account for about 80% of the overall turnover in trade of fruit and vegetables. In addition to the official representation of its members and public relations activities, the association is also active in providing consulting services, the organisation of working groups, training and information (www.dfhv.de).

A last sector institution in the supply chain is the Central Marketing Organisation of German Agricultural Industries (CMA). Its main objective is the promotion of sales of agricultural products at the domestic market and abroad. Shareholders in the CMA are umbrella organisations from the German food and agricultural industry, from the retailing industry and from the processing sectors. Jointly with its shareholders the CMA develops campaigns and sales promotions trying to distinguish the quality and the special characteristics of the German products (www.cma.de).

Furthermore, another initiative in the supply chain is the “5-a-day” initiative under the auspices of the Federal Ministry of Consumer Protection, Food and Agriculture and the Federal Ministry of Health and Social Security. This campaign aims in the motivation of consumers for a higher and more regular consumption of fruit and vegetables. Its objective is to educate and stimulate a more sustainable nutrition of the general population to reach public health benefits. It is state-aided, founded in 2000 and is currently supported by 74 partners, most of them active in the trade of fruit (www.5amtag.de).

5 Conclusions

With 82.5 million inhabitants, Germany is the largest market for fresh fruit and vegetables in the EU. Due to natural production limitations 50% of fresh vegetables and 80% of fresh fruit have to be imported from foreign countries. Until now, most of the imports are from other EU-countries. In case of further liberalisation between the EU and the Mediterranean countries in the framework of the Barcelona-Agreement, big market opportunities exist for Mediterranean countries with comparative advantages in the production of fruit and vegetables.

One of the most important driving forces for the consumption of fresh fruit and vegetables is their healthy image and the resultant promotion in modern lifestyles. It is expected that the consumption of fruit and vegetables will further increase in the next years. Nevertheless not all fruit and vegetables will gain from this. Especially dynamic products are considered to be nectarines, grapes strawberries, lemons and pineapples for fruit and paprika, onions, courgette and chicory for vegetables. Less demanded products are mandarins and bananas for fruit and cabbages and lettuce for vegetables. Two demographic trends (aging of the German population and the decrease in household size) are also expected to influence the demand for fresh fruit and vegetables. As it could be already observed in the last years, the share of processed or frozen fruit and vegetables will continue to rise and also out of home consumption will grow in importance. Exporters of fruit and vegetables to Germany are well advised to carefully explore the changing consumption patterns and the supply requirements of this market channel.

Another demand driven change in the supply chain of fruit and vegetables is the increasing importance of quality assurance systems for all actors in the supply chain. As consumer awareness with regard to food quality and food safety has risen dramatically in the last years, politicians and food retailers have reacted by the implementation of mandatory quality systems for the suppliers and traders of fruit and vegetables. The fulfillment of quality systems like EurepGAP, IFS or Q+S will soon be a pre-condition for the market entry in Germany.

At the moment the supply chain of fruit and vegetables in Germany is characterised by its complexity. Unlike in the Netherlands and the UK, a large number of different actors and marketing channels exist, though the amount of information on the flow of products is very limited. Using different secondary sources and the results of an own survey we were able to identify the main market channels. One major trend in the supply chain is the growing importance of retailers at the expense of the wholesale trade, resulting in a similar situation like in the UK and the Netherlands. In the long run, the integrative approach of supply chain management will certainly become more important, though specialized marketing channels will always co-exist and can be another way for exporters to enter the market in Germany. Nevertheless, the already started concentration process at all levels of the supply chain is very likely to increase. Until now, there is a large number of small enterprises engaged in every level of the supply chain.

The concentration process at the wholesale level will also affect the producers of fruit and vegetables. Already the traders and retail chains are requiring large, uniform and certified supplies, a trend which will also increase the pressure on producers for cooperation and/or growth.

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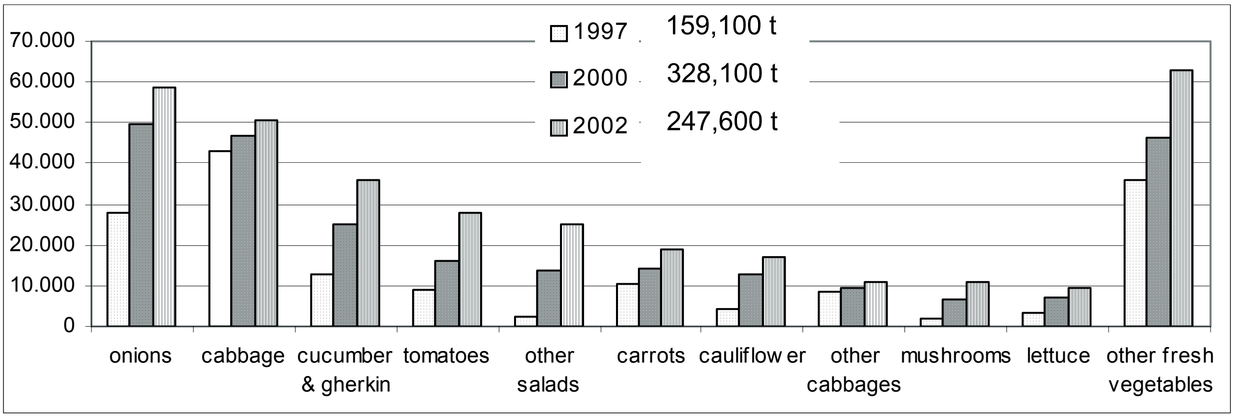
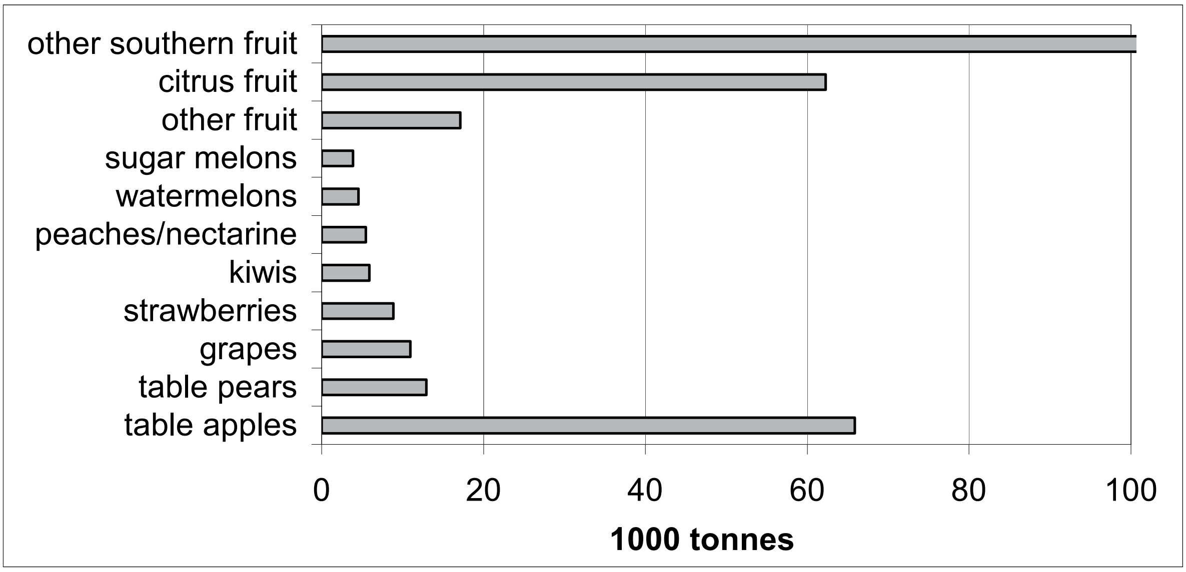
7 Annex

Figure 9: Most important export products of fresh vegetables in Germany



Source: ZMP, 2004 b

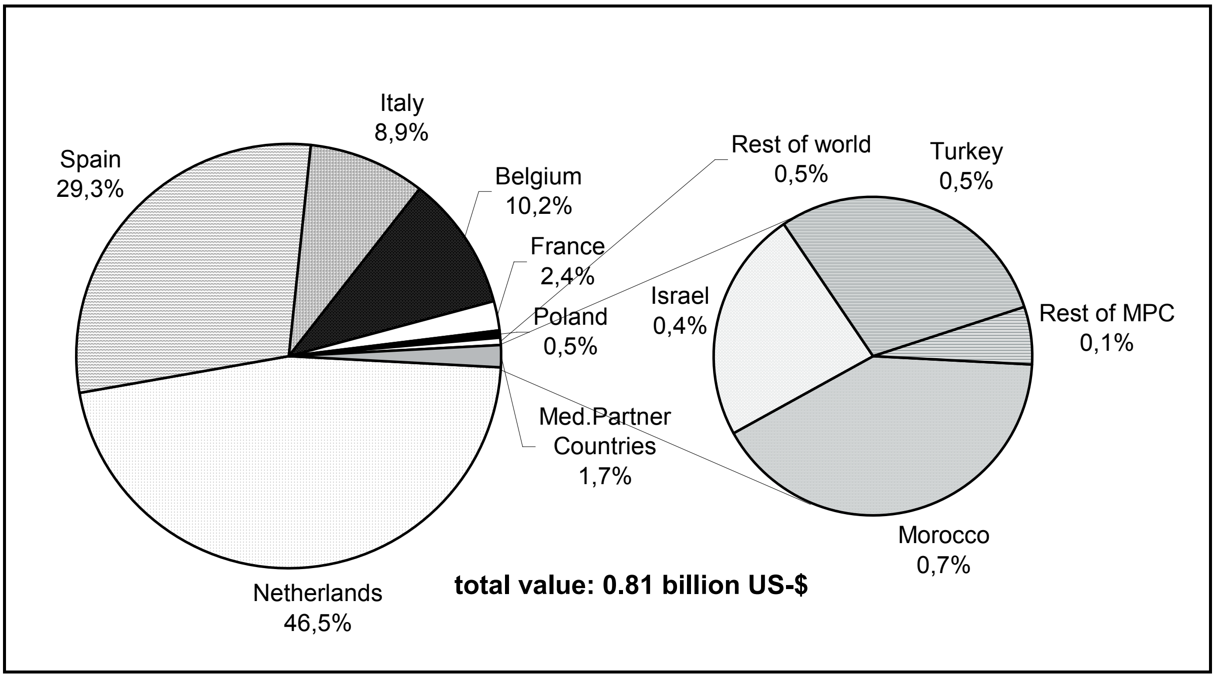
Figure 10: Most important export products of fresh fruit, Germany 2002[1]



[1] The above mentioned figures do include re-exports.

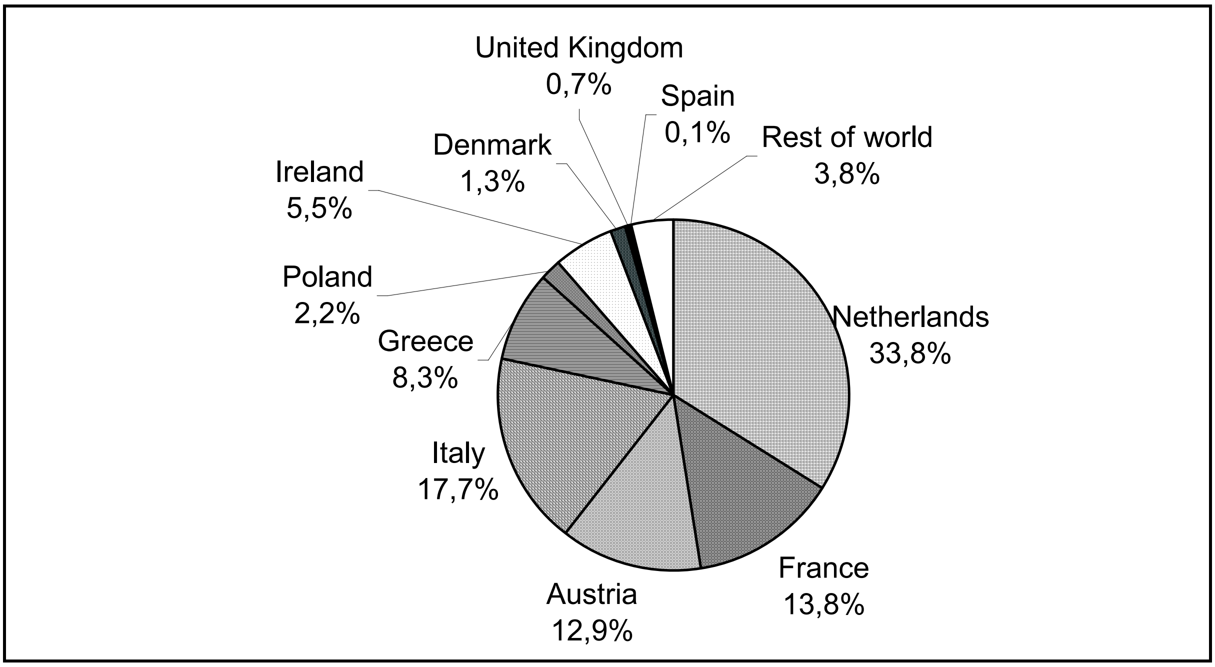
Source: ZMP, 2004 a

Figure 11: Origin of tomatoes imported by Germany in 2003



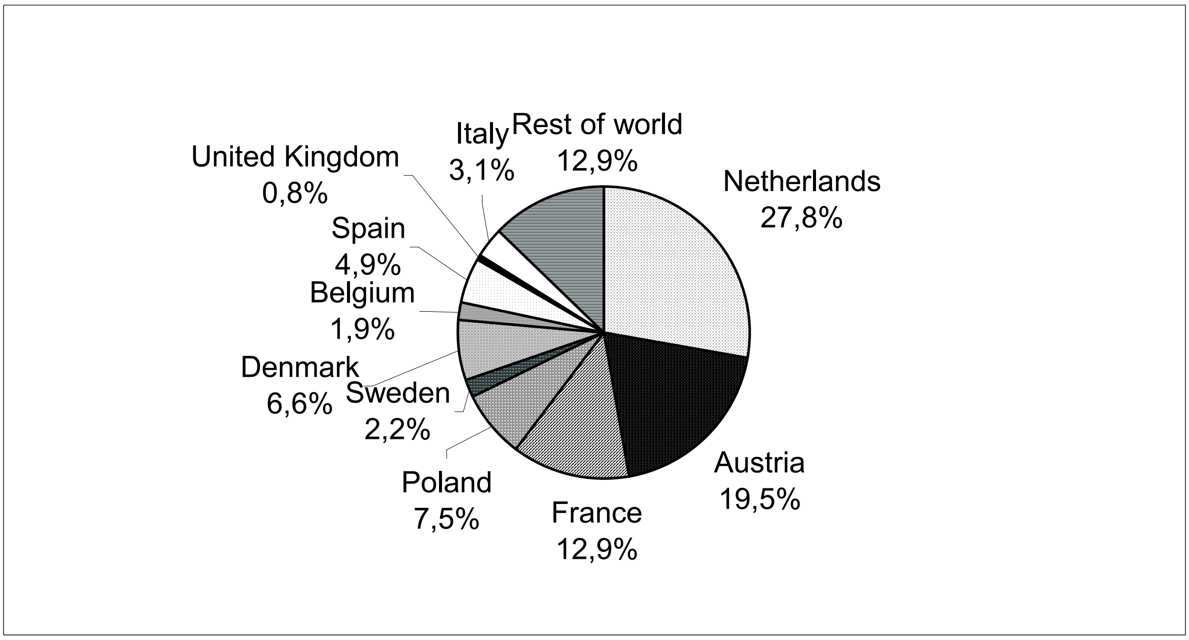
Source: Own composition based on ITC/ PC-TAS

Figure 12: Main export destinations of tomatoes from Germany (2003)



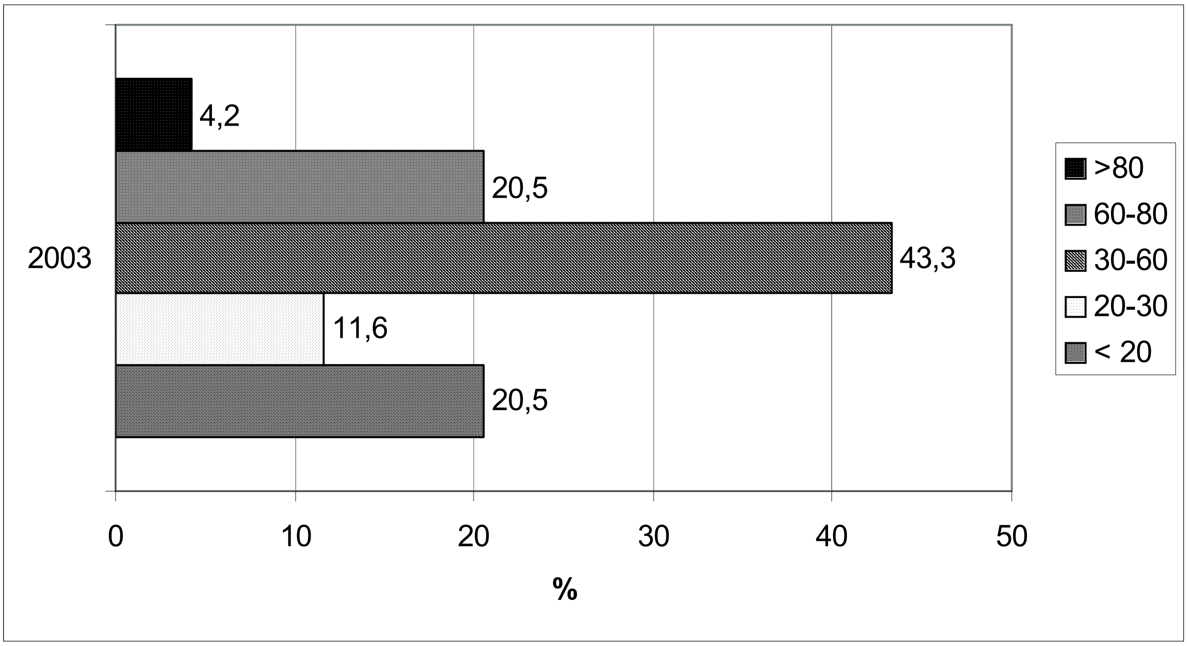
Source: Own composition based on ITC/ PC-TAS

Figure 13: Main export destinations of oranges from Germany (2003)



Source: Own composition based on ITC/ PC-TAS

Figure 14: Demographic structure in Germany



Source: Own composition based on Statistisches Bundesamt, 2005 b

Table 9: Main macroeconomic indicators for Germany, 1997-2003

Indicator	1997	1998	1999	2000	2001	2002	2003
GDP in billion € (current price)	1840.0	1876.0	1915.0	1970.0	1986.0	1990.0	1988.0
GDP (% change from last year)	1.4	2.0	2.0	2.9	0.8	0.2	-0.1
Gross Value Added of Agriculture to GDP (in billion €)	22.9	22.6	22.1	22.5	23.5	22.0	21.8
Population (million)	82.1	82.0	82.2	82.3	82.4	82.5	82.5
Level of unemployment (%)	11.4	11.1	10.5	9.6	9.4	9.8	10.5
Employment (million)	37.2	37.6	38.0	38.7	38.9	38.7	38.2
Employment in agriculture, forestry and fishery (million)	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Private consumption (billion €)	1024.0	1052.0	1091.0	1128.0	1168.0	1173.0	1185.0

Source: ZMP, 2004b after ZMP, BMVEL, StBA.

Table 10: Evolution of prices of food, fruit and vegetables (2000=100)

Price index:		1997	1998	1999	2001	2002	2003
total household expenditure		97.1	98.0	98.6	102.0	103.4	104.5
food	nominal	101.0	102.0	100.7	104.5	105.3	105.2
	real*	104.0	104.1	102.1	102.5	101.8	100.7
fruit	nominal	103.2	106.3	102.8	108.2	108.2	106.9
	real*	106.3	108.5	104.3	106.1	104.6	102.3
citrus fruit, fresh, chilled	nominal	109.8	106.9	111.9	109.7	110.7	109.4
	real*	113.1	109.1	113.5	107.5	107.1	104.7
canned fruit	nominal	108.9	116.8	117.1	99.7	97.0	96.8
	real*	112.2	119.2	118.8	97.7	93.8	92.6
vegetables	nominal	100.4	100.7	100.7	104.9	103.6	102.1
	real*	103.4	102.8	102.1	102.8	100.2	97.7
frozen vegetables	nominal	102.3	102.8	101.3	101.5	100.5	100.2
	real*	105.4	104.9	102.7	99.5	97.2	95.9
canned vegetables	nominal	100.5	100.5	99.7	99.7	99.8	100.0
	real*	103.5	102.6	101.1	97.7	96.5	95.7
tomatoes, paprika, cucumbers, other fruit-vegetables	nominal	102.8	103.7	100.6	94.8	100.8	97.5
	real*	105.9	105.8	102.0	92.9	97.5	93.3
retail trade with fruit, vegetables and potatoes	nominal	101.0	102.7	101.0	107.5	107.2	105.8
	real*	104.0	104.8	102.4	105.4	103.7	101.2

* own calculations based on BMVEL

Source: BMVEL 2004.

Table 11: Evolution of producer prices (nominal, 1995=100)

	1997	1998	1999	2000	2001	2002	2003
all agricultural products	100.5	95.6	89.9	95.4	100.8	94.6	94.9
fruit	104.9	103.3	79.4	84.4	94.9	99.1	112.8
vegetables	95.0	94.5	90.6	97.1	120.2	99.7	97.8

Source: Statistisches Bundesamt, different years.

Table 12: Domestic production (in 1000 tonnes)

	1997	1998	1999	2000	2001	2002	2003
total harvested production of fruit	1162.1	1460.1	1606.3	1722.8	1457.8	1252.4	1288.5
fruit trees	868.7	1136.8	1221.5	1318.2	1080.0	935.5	991.2
soft fruit	214.5	241.8	275.6	280.3	267.7	211.6	202.1
strawberries	78.9	81.5	109.2	104.3	110.1	105.3	95.3
citrus fruit	0.0	0.0	0.0	0.0	0.0	0.0	0.0
self sufficiency rate (in %)	10.3	13.4	13.4	15.3	11.1	10.0	n.a.
total harvested production of vegetables	2596.0	2706.0	2910.0	3004.0	2873.0	2815.0	2869.0
open-grown vegetables	2434.0	2532.0	2739.0	2820.0	2695.0	2635.0	2680.0
of which tomatoes	4.0	4.0	3.0	2.0	2.0	2.0	3.0
vegetables under glass	102.0	114.0	111.0	122.0	115.0	118.0	127.0
of which tomatoes	35.0	38.0	39.0	43.0	44.0	45.0	49.0
champignons	60.0	60.0	60.0	62.0	63.0	62.0	62.0
self sufficiency rate (in %)	39.6	40.4	42.0	41.8	40.2	39.6	n.a.

Source: BMVEL 2004 ; ZMP, 2004 a+b

Table 13: Production quantity and value of the most important open-grown vegetables in Germany, 2003

Type of vegetable	1000 t	€/t	1,000 €
Asparagus	65.3	2950.1	192.751
Carrots	426.0	210.8	89.809
White cabbage	488.1	169.3	82.641
Onions	271.5	279.6	75.917
Cucumber	178.0	365.2	64.999
Cauliflower	136.6	429.8	58.711
Field salad	13.8	3359.8	46.338
Spinach	56.8	731.9	41.601
Fresh peas	26.4	1472.7	38.809
Leek	65.1	555.6	36.148
Red cabbage	132.0	199.3	26.298
Radish	76.2	177.3	13.518
Ice letture	104.9	n. a.	n. a.
Letture	74.5	n. a.	n. a
Other vegetables	361.4	n. a.	n. a.
Total fresh vegetables	**2477.0**	**n. a.**	**n. a.**

n. a. stands for no available information

Source: ZMP, 2004 b

Table 14: Production quantity and value of the most important fruit in Germany, 2003

Type of fruit	1000 t	€/t	1000 €
Bush berries	202	2.000	404.200
Apple	818	346	283.110
Strawberries	95	2.422	230.788
Cherries	33	1.388	46.363
Plums	48	759	36.337
Sour cherries	34	719	24.213
Pears	54	402	21.507
Yellow plums	4	887	3.638
Total fruit	**1288.0**	**n. a.**	**1,050,156**

n. a. stands for no available information

Source: ZMP, 2004 a

Table 15: Consumption of fruit and vegetables in Germany

	1997	1998	1999	2000	2001	2002
fruit:						
consumption in 1000t	8404	8259	9006	8572	9794	9555
human consumption per capita in kg	102	101	110	104	119	116
vegetables:						
consumption	7200	7287	7522	7734	7865	7709
human consumption per capita in kg	88	89	92	94	95	93

Source: BMVEL 2004 ; ZMP, 2004 a+b

Table 16: Consumption of fresh vegetables in Germany from 1997-2003, per 100 households

Type of vegetable	Quantity in kg per 100 households 1997	2000	2003
Salads and leafy vegetables	628	758	646
- lettuce	172	146	111
- ice lettuce	270	347	286
- endive	43	41	35
- chicory	55	71	78
stem vegetables	206	221	213
- peiplant	18	19	17
- asparagus	188	202	196
fruit vegetables	2525	2482	2416
- cucumbers	685	711	731
- tomatoes	1016	1127	1034
- paprica	392	425	474
- courgette	61	91	80
cabbages	1094	1063	935
- cauliflower	328	300	241
- white cabbage	168	161	159
- kohlrabi	146	131	113
- savoy cabbage	59	59	52
- chinese cabbage	85	67	71
- brussel spouts	84	110	82
- broccoli	140	151	120
root vegetables	935	1033	950
- carrots	695	770	698
- radish	79	86	92
- cellery	47	52	44
bulb vegetables	699	818	863
- onions	521	594	661
- leek	128	153	140
Fungi	97	121	110
- mushrooms	88	108	98
Total	**6185**	**6514**	**6266**

Source: ZMP, 2004 b

Table 17: Consumption of fresh fruit in Germany from 1997-2003, per 100 households

	Quantity in kg per 100 households		
Type of fruit	**1997**	**2000**	**2003**
Stone fruit	690	859	819
- Apricots	88	95	79
- Cherries	51	75	65
- Yellow plums	144	137	155
- Nectarines	226	346	346
- Peaches	179	204	174
Pip fruit	2,572	2,568	2,642
- Apples	2,213	2,232	2,296
- Pears	357	335	346
Sofft fruit	1278	1,364	1,461
- Strawberries	362	375	428
- Grapes	643	699	743
- Kiwis	273	257	253
Citrus fruit	2,211	2,256	2,168
- Mandarines	766	683	629
- Oranges	1,090	1,191	1,175
- Grapefruit	162	162	152
- Lemons	167	196	211
Other southern fruit	2,182	2,125	2,048
- Bananas	1,970	1,894	1,770
- Pineapple	127	119	154
- Other	110	112	124
Melons	270	275	326
Total	9,228	9,464	9,485

Source: ZMP, 2004 a

Table 18: Most important export products of fresh vegetables, Germany 1997-2002[1]

Type of vegetables	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**
Onions	27,807	28,410	27,615	49,745	45,308	58,777
White and red cabbage	42,842	35,322	30,625	46,670	45,892	50,835
Cucumber and gherkin	12,601	17,164	28,549	25,068	30,158	35,866
Tomatoes	9,149	11,996	12,495	15,939	29,270	27,712
Other salads	2,327	5,622	11,574	13,910	19,876	24,883
Carrots	10,530	13,914	9,990	14,078	19,932	18,910
Cauliflower	4,378	8,875	10,864	12,784	19,841	17,079
Other cabbages	8,447	8,178	8,810	9,530	14,912	10,943
Mushrooms	2,032	3,824	4,401	6,734	7,797	10,699
Ice lettuce and lettuce	3,254	6,298	11,449	6,892	8,687	9,309
Other fresh vegetables	35,771	59645	53080	46226	64994	63127
Total fresh vegetables	**159,138**	**199,248**	**209,452**	**247,573**	**306,668**	**328,138**

[1] The above mentioned figures do include re-exports.

Source: ZMP, 2004 b

Table 19: Most important export products of fresh fruit, Germany 1997-2002[1]

Type of fruit	1997	1998	1999	2000	2001	2002
Table apples	57,513	59,067	73,108	72,075	74,957	65,879
Table pears	10,424	9,384	9,657	8,711	9,592	12,925
Grapes	16,411	21,694	15,450	11,126	12,282	10,965
Strawberries	2,892	4,713	8,031	8,081	10,086	8,871
Kiwis	8,382	6,093	7,992	5,788	6,403	5,886
Peaches, nectarines	6,392	9,572	9,518	7,250	5,419	5,457
Water melons	2,113	3,020	3,748	2,642	2,169	4,549
Sugar melons	2,249	3,667	6,003	2,334	2,781	3,886
Other fruit	13,409	18,166	18,758	28,571	27,848	17,137
Citrus fruit	74,491	67,561	64,170	41,975	36,486	62,275
Other southern fruit	98,553	83,922	146,326	121,982	121,982	222,521
Total fresh fruit	**292,829**	**286,858**	**362,760**	**310,534**	**310,004**	**420,350**

[1] The above mentioned figures do include re-exports. It becomes obvious from the products, that re-exports account for most of the exports. Source: ZMP, 2004 a

Table 20: Most important import products of fresh vegetables, Germany 1997-2002

Type of vegetable	1997	1998	1999	2000	2001	2002
Tomatoes	651,599	646,877	686,679	694,467	703,622	685,161
cucumbers, gherkin	436,863	442,876	424,490	424,151	439,699	429,639
vegetable paprica	239,763	263,890	260,693	259,567	270,128	296,801
Onions	234,190	296,871	286,664	274,136	288,617	285,962
Carrots	183,522	204,878	204,099	185,925	207,917	196,926
Other salad	74,259	94,843	111,165	143,759	150,754	156,668
Lettuce	159,614	169,928	156,769	149,045	126,983	131,260
other cabbages	142,935	129,702	128,040	129,637	116,196	104,870
Cauliflower	113,654	112,194	101,631	101,655	90,346	83,138
Mushrooms	32,777	30,075	37,269	44,374	50,798	50,553
Other fresh vegetables	478,160	503,335	492,735	468,608	484,116	462,531
Total fresh vegetables	2,747,336	2,895,470	2,890,234	2,875,325	2,929,177	2,883,508

Source: ZMP, 2004 a

Table 21: Most important import products of fresh fruit, Germany 1997-2002

Type of fruit	1997	1998	1999	2000	2001	2002
Bananas	1,132,311	1,032,624	1,033,848	1,150,512	1,105,147	1,200,855
Table apples	662,664	679,443	709,800	656,203	615,517	707,003
Oranges	474,580	471,220	378,243	525,819	477,604	545,100
Mandarines	420,241	445,223	344,351	434,265	338,370	362,439
Grapes	360,278	360,120	399,739	387,758	363,174	309,881
Nectarines, peaches	263,063	278,753	357,665	328,187	300,188	306,360
Watermelons	173,193	177,711	198,261	189,522	240,130	193,273
Table pears	184,570	180,903	212,407	175,859	169,779	165,206
Lemon	135,856	140,261	148,398	149,181	148,555	150,059
Cide apples	152,375	85,517	127,426	78,097	82,333	129,933
Strawberries	141,099	154,111	152,421	136,447	149,368	118,459
Other fresh fruit	655,215	686,537	834,653	725,969	695,779	681,107
Total Fresh Fruit	**4,755,445**	**4,692,422**	**4,897,211**	**4,937,820**	**4,685,944**	**4,869,675**

Source: ZMP, 2004 a

Table 22: Imports of tomatoes (HS070200) to Germany from country of origin

Partner country	Value (in 1000 US $)					Quantity (in tonnes)					V/Q in %	Share in % (2003)		Trend in %	
	1999	2000	2001	2002	2003	1999	2000	2001	2002	2003	(2003)	Value	Quantity	Value	Quantity
world	676484	633299	640237	755543	811545	686679	625718	703607	685161	614712	1.3	100.0	100.0	5.6	-1.3
top 10 partners															
-Netherlands	288171	278245	239922	304816	377736	261640	247267	238697	260252	249893	1.5	46.5	40.7	6.5	-0.4
-Spain	215539	189647	207774	242378	237383	259948	226059	276269	247995	223559	1.1	29.3	36.4	4.5	-2.1
-Italy	73468	71808	88249	86019	72074	65756	60948	78066	66519	45550	1.6	8.9	7.4	1.4	-6.3
-Belgium	59522	59567	67946	79196	82727	61835	58909	73748	73815	59167	1.4	10.2	9.6	9.9	1.4
-France	24013	19199	19857	23918	19813	22987	18229	19869	19599	14198	1.4	2.4	2.3	-1.6	-8.5
-Morocco	8447	4800	5060	8527	5465	9545	5334	6130	7419	5668	1.0	0.7	0.9	-2.9	-6.9
-Israel	4337	1638	4314	4182	3519	2272	942	3086	2803	2443	1.4	0.4	0.4	5.3	13.2
-Turkey	872	2540	1877	2643	4439	915	2976	2267	2677	4958	0.9	0.5	0.8	39.0	38.7
-Poland	21	173	103	177	3842	22	253	199	296	4319	0.9	0.5	0.7	184.1	192.0
-Canada	433	319	3088	206	98	492	278	3193	165	113	0.9	0.0	0.0	-28.9	-29.3
Med. Countries	13804	9286	11422	15651	13604	12815	9453	11651	13085	13189	1.0	1.7	2.1	5.1	3.9
-Morocco	8447	4800	5060	8527	5465	9545	5334	6130	7419	5668	1.0	0.7	0.9	-2.9	-6.9
-Israel	4337	1638	4314	4182	3519	2272	942	3086	2803	2443	1.4	0.4	0.4	5.3	13.2
-Turkey	872	2540	1877	2643	4439	915	2976	2267	2677	4958	0.9	0.5	0.8	39.0	38.7
-Egypt	79	186	56	61	65	41	101	56	42	50	1.3	0.0	0.0	-14.0	-4.7
-Tunisia	66	40	44	162	107	40	28	27	94	65	1.6	0.0	0.0	26.7	24.4
-Jordan	3	55	20	74	9	2	34	22	48	5	1.8	0.0	0.0	28.3	24.3
-Syria A. R.	0	27	51	2	0	0	38	63	2	0	*	0.0	0.0	*	*

Source: ITC/ PC-TAS

Table 23: Imports of oranges (HS080510) to Germany from country of origin

Partner country	Value (in 1000 US $)					Quantity (in tonnes)					V/Q in % (2003)	Share in % (2003)		Trend in %	
	1999	2000	2001	2002	2003	1999	2000	2001	2002	2003		Value	Quantity	Value	Quantity
world	266673	235136	252184	288455	314009	507142	569992	534029	604752	564350	0.6	100.0	100.0	5.5	2.8
top 10 partners															
-Spain	186789	177131	178324	225352	244807	350516	430107	376044	466285	442154	0.6	78.0	78.3	8.1	5.6
-Italy	14770	16874	18109	18699	12821	30208	44327	44412	41453	21599	0.6	4.1	3.8	-1.8	-7.1
-Morocco	22110	7580	9348	9363	10089	44264	21224	19645	18612	18065	0.6	3.2	3.2	-12.7	-17.5
-South Africa	0	11054	13432	11083	17267	0	27199	22589	25091	27462	0.6	5.5	4.9	*	*
-Greece	2803	5030	13492	10465	15281	6444	15257	34843	25889	33291	0.5	4.9	5.9	51.1	46.4
-Argentina	4305	4422	5904	4602	5081	7318	8523	9437	9320	7529	0.7	1.6	1.3	3.8	1.5
-Zimbabwe	5888	6638	3089	1904	3214	9915	9981	6979	4591	5191	0.6	1.0	0.9	-21.8	-18.7
-S.Afr.Cus.Union	14771	0	0	0	0	30837	0	0	0	0	*	0.0	0.0	*	*
-France	7061	2161	2544	1135	526	12664	3591	5268	1826	708	0.7	0.2	0.1	-44.2	-47.5
-Turkey	1147	528	3321	2438	1733	2128	1170	5817	4600	2821	0.6	0.6	0.5	26.6	21.3
Med. Countries	27625	10307	15945	13957	12822	54638	27690	31815	27977	22896	0.6	4.1	4.1	-11.6	-15.9
-Morocco	22110	7580	9348	9363	10089	44264	21224	19645	18612	18065	0.6	3.2	3.2	-12.7	-17.5
-Turkey	1147	528	3321	2438	1733	2128	1170	5817	4600	2821	0.6	0.6	0.5	26.6	21.3
-Israel	3130	1560	1975	502	61	6000	3700	3945	774	86	0.7	0.0	0.0	-59.4	-63.4
-Cyprus	1211	540	575	299	279	2187	1310	958	571	469	0.6	0.1	0.1	-29.7	-32.4
-Egypt	27	99	726	1355	660	59	286	1450	3420	1455	0.5	0.2	0.3	146.2	143.3

Source: ITC/ PC-TAS

Table 24: Imports of mandarins, clementines and similar fruit (HS080520) to Germany from country of origin

Partner country	Value (in 1000 US $)					Quantity (in tonnes)					V/Q in % (2003)	Share in % (2003)		Trend in %	
	1999	2000	2001	2002	2003	1999	2000	2001	2002	2003		Value	Quantity	Value	Quantity
world	261486	244365	231100	241217	288427	344351	400383	338365	362439	353541	0.8	100.0	100.0	1.8	-0.5
top 10 partners															
-Spain	227094	218964	202508	212168	260263	297315	357079	295930	321149	319810	0.8	90.2	90.5	2.4	0.4
-Morocco	14135	6550	5041	5737	6748	20119	11104	6797	8370	8336	0.8	2.3	2.4	-14.9	-18.5
-Turkey	6596	3870	6527	5395	4543	9145	7089	11022	9589	6107	0.7	1.6	1.7	-4.1	-4.9
-Italy	1842	7509	5943	6302	3258	2444	13046	9254	8221	3578	0.9	1.1	1.0	10.1	3.1
-Greece	2725	2158	3040	4033	5315	4342	4042	4791	6045	6292	0.8	1.8	1.8	21.7	12.1
-Cyprus	2520	2059	2531	3302	3518	3108	3228	3119	3792	4291	0.8	1.2	1.2	12.1	8.4
-Argentina	1756	904	1766	1629	1516	1959	964	2101	2092	1534	1.0	0.5	0.4	3.0	2.9
-France	2195	914	627	1060	1739	2535	1383	966	1337	1936	0.9	0.6	0.5	-3.1	-5.6
-Israel	832	478	1305	245	150	1081	1047	1969	293	129	1.2	0.1	0.0	-33.6	-42.5
-South Africa	0	477	911	447	523	0	777	1268	516	659	0.8	0.2	0.2	*	*
Med. Countries	24095	12972	15406	14702	15253	33465	22483	22908	22081	19185	0.8	5.3	5.4	-7.6	-10.7
-Morocco	14135	6550	5041	5737	6748	20119	11104	6797	8370	8336	0.8	2.3	2.4	-14.9	-18.5
-Turkey	6596	3870	6527	5395	4543	9145	7089	11022	9589	6107	0.7	1.6	1.7	-4.1	-4.9
-Cyprus	2520	2059	2531	3302	3518	3108	3228	3119	3792	4291	0.8	1.2	1.2	12.1	8.4
-Israel	832	478	1305	245	150	1081	1047	1969	293	129	1.2	0.1	0.0	-33.6	-42.5
-Egypt	12	15	2	23	294	12	15	1	37	322	0.9	0.1	0.1	97.9	111.3

Source: ITC/ PC-TAS

Table 25: Imports of lemons and lime (HS080530) to Germany from country of origin

Partner country	Value (in 1000 US $)					Quantity (in tonnes)					V/Q in %	Share in % (2003)		Trend in %	
	1999	2000	2001	2002	2003	1999	2000	2001	2002	2003	(2003)	Value	Quantity	Value	Quantity
world	107410	85200	89971	87213	105215	148400	141451	148546	150060	134532	0.8	100.0	100.0	-0.2	-1.4
top 10 partners															
-Spain	69838	57859	55997	55962	65023	100962	100390	98157	104064	85906	0.8	61.8	63.9	-1.7	-2.8
-Argentina	14975	10054	14304	13574	19242	20491	16601	24050	24677	26941	0.7	18.3	20.0	8.3	9.9
-Brazil	2389	3416	5288	6253	8075	1074	1854	3522	5125	7263	1.1	7.7	5.4	35.5	62.2
-Italy	4570	3243	4870	3733	3434	7292	6601	9438	7308	4762	0.7	3.3	3.5	-4.2	-7.2
-Mexico	4312	2255	2427	3216	1921	2278	1424	2037	2206	1186	1.6	1.8	0.9	-11.9	-8.3
-Turkey	5009	2028	1816	611	2205	7769	3636	3248	1151	2585	0.9	2.1	1.9	-24.7	-28.5
-Greece	2363	2403	1898	1757	2344	3895	4645	2849	1918	2296	1.0	2.2	1.7	-3.2	-17.6
-Cyprus	1981	1854	1209	973	838	2842	3120	2184	1730	941	0.9	0.8	0.7	-21.1	-24.4
-South Africa	0	1100	1624	770	1491	0	1982	2472	1364	1959	0.8	1.4	1.5	*	*
-Uruguay	143	184	182	141	324	153	269	224	285	413	0.8	0.3	0.3	14.7	22.7
Med. Countries	7030	3884	3046	1640	3081	10666	6759	5456	2924	3556	0.9	2.9	2.6	-22.2	-26.2
-Turkey	5009	2028	1816	611	2205	7769	3636	3248	1151	2585	0.9	2.1	1.9	-24.7	-28.5
-Cyprus	1981	1854	1209	973	838	2842	3120	2184	1730	941	0.9	0.8	0.7	-21.1	-24.4
-Israel	40	2	21	56	38	55	3	24	43	30	1.3	0.0	0.0	38.1	15.6

Source: ITC/ PC-TAS

Table 26: Imports of grapefruit (HS080540) to Germany from country of origin

Partner country	Value (in 1000 US $)					Quantity (in tonnes)					V/Q in % (2003)	Share in % (2003)		Trend in %	
	1999	2000	2001	2002	2003	1999	2000	2001	2002	2003		Value	Quantity	Value	Quantity
world	63081	37457	43883	40734	54480	106819	73749	72887	71708	64405	0.8	100.0	100.0	-2.1	-9.9
top 10 partners															
-USA	13412	10137	12755	12005	15101	23908	18139	21219	19838	18103	0.8	27.7	28.1	4.1	-4.6
-Turkey	7183	7256	5054	8667	8226	12355	14501	10469	15700	10943	0.8	15.1	17.0	4.6	-1.6
-Israel	9474	4577	8953	4943	5743	16966	9137	15197	7699	7202	0.8	10.5	11.2	-8.8	-17.2
-Spain	12902	3130	3261	3231	4388	19654	6135	6236	6084	6886	0.6	8.1	10.7	-19.1	-19.0
-South Africa	0	3952	4623	3602	6220	0	9845	6814	7647	6443	1.0	11.4	10.0	*	*
-Argentina	2982	2514	3460	2730	4600	4836	4304	4820	5363	4955	0.9	8.4	7.7	10.0	2.7
-Honduras	1546	1970	1561	1623	2072	2534	3701	1874	2734	2203	0.9	3.8	3.4	4.0	-5.7
-S.Afr.Cus.Union	8105	0	0	0	0	14243	0	0	0	0	*	0.0	0.0	*	*
-Cyprus	1885	874	615	1162	1086	3480	1912	1123	1928	1344	0.8	2.0	2.1	-7.9	-17.3
-France	2390	991	474	99	724	3547	1328	621	152	526	1.4	1.3	0.8	-37.5	-45.0
Med. Countries	18543	12708	14668	14890	15453	32803	25551	26865	25538	19683	0.8	28.4	30.6	-2.0	-9.7
-Turkey	7183	7256	5054	8667	8226	12355	14501	10469	15700	10943	0.8	15.1	17.0	4.6	-1.6
-Israel	9474	4577	8953	4943	5743	16966	9137	15197	7699	7202	0.8	10.5	11.2	-8.8	-17.2
-Cyprus	1885	874	615	1162	1086	3480	1912	1123	1928	1344	0.8	2.0	2.1	-7.9	-17.3
-Egypt	0	0	0	0	297	0	0	0	0	104	2.9	0.5	0.2	*	*
-Morocco	1	1	46	2	101	2	1	76	1	90	1.1	0.2	0.1	169.8	114.1
-Syria A. R.	0	0	0	116	0	0	0	0	210	0	*	0.0	0.0	*	*

Source: ITC/ PC-TAS

Table 27: Imports of citrus fruit (HS080590) to Germany from country of origin

Partner country	Value (in 1000 US $)					Quantity (in tonnes)					V/Q in % (2003)	Share in % (2003)		Trend in %	
	1999	2000	2001	2002	2003	1999	2000	2001	2002	2003		Value	Quantity	Value	Quantity
world	2648	2221	4326	3305	4848	3014	1697	3420	4384	5079	1.0	100.0	100.0	17.4	22.1
top 10 partners															
-Spain	503	634	1378	2180	3176	786	658	1614	3665	3844	0.8	65.5	75.7	63.6	63.1
-Mexico	278	995	1466	45	6	180	500	708	20	3	2.0	0.1	0.1	-65.9	-68.0
-Israel	603	311	496	446	673	311	286	332	205	312	2.2	13.9	6.1	6.0	-3.2
-Turkey	425	14	150	122	151	665	23	198	98	202	0.7	3.1	4.0	1.0	-8.9
-Brazil	10	4	695	94	12	7	2	484	117	6	2.0	0.2	0.1	42.2	45.7
-South Africa	0	155	79	259	268	0	135	43	174	132	2.0	5.5	2.6	*	*
-S.Afr.Cus.Union	575	0	0	0	0	836	0	0	0	0	*	0.0	0.0	*	*
-Argentina	19	10	0	42	382	18	8	0	53	429	0.9	7.9	8.4	*	*
-France	163	35	0	4	120	139	33	0	3	83	1.4	2.5	1.6	*	*
-Italy	3	24	19	56	0	2	26	10	18	0	*	0.0	0.0	*	*
Med. Countries	1028	325	646	568	824	976	309	530	303	514	1.6	17.0	10.1	1.2	-12.2
-Israel	603	311	496	446	673	311	286	332	205	312	2.2	13.9	6.1	6.0	-3.2
-Turkey	425	14	150	122	151	665	23	198	98	202	0.7	3.1	4.0	1.0	-8.9

Source: ITC/ PC-TAS

Table 28: Exports of tomatoes (HS070200) from Germany to other countries

Partner country	Value (in 1000 US $)					Quantity (in tonnes)					V/Q in % (2003)	Share in % (2003)		Trend in %	
	1999	2000	2001	2002	2003	1999	2000	2001	2002	2003		Value	Quantity	Value	Quantity
world	13250	14225	25852	34846	32826	12495	13396	29269	27718	22934	1.4	100.0	100.0	31.1	21.4
top 10 partners															
-Netherlands	4970	7144	16650	20052	11099	4415	7001	19752	15305	8711	1.3	33.8	38.0	30.2	23.9
-France	2685	2046	2314	4903	4514	2742	2015	2260	4248	3334	1.4	13.8	14.5	21.1	12.0
-Austria	1715	1599	2767	3754	4250	1473	1401	2724	3152	2619	1.6	12.9	11.4	30.6	21.7
-Italy	878	1375	1558	2652	5815	806	1152	1662	2174	3237	1.8	17.7	14.1	55.9	40.7
-Greece	2	198	251	1139	2738	6	151	217	1024	1816	1.5	8.3	7.9	405.0	279.6
-Poland	1401	651	411	281	707	1497	554	529	272	807	0.9	2.2	3.5	-19.8	-17.7
-Ireland	0	0	115	772	1795	0	0	124	521	988	1.8	5.5	4.3	*	*
-Denmark	385	364	717	683	414	301	281	771	517	366	1.1	1.3	1.6	8.1	10.5
-United Kingdom	163	127	544	312	234	144	100	490	202	92	2.5	0.7	0.4	17.6	-1.9
-Spain	788	113	10	62	25	830	108	9	56	17	1.5	0.1	0.1	-52.8	-57.0
Med. Countries															

Source: ITC/ PC-TAS

Table 29: Exports of oranges (HS080510) from Germany to other countries

Partner country	Value (in 1000 US $)					Quantity (in tonnes)					V/Q in % (2003)	Share in % (2003)		Trend in %	
	1999	2000	2001	2002	2003	1999	2000	2001	2002	2003		Value	Quantity	Value	Quantity
world	14838	7079	8341	18990	10390	29304	16064	14632	37630	13947	0.7	100.0	100.0	2.8	-6.1
top 10 partners															
-Netherlands	1381	1601	1628	5321	2886	2530	3894	2872	11345	3340	0.9	27.8	23.9	30.7	17.6
-Austria	2733	1587	1531	2066	2022	5091	3881	2767	3601	2705	0.7	19.5	19.4	-3.3	-12.5
-France	1005	558	971	1837	1343	1502	1104	1636	3189	2002	0.7	12.9	14.4	19.4	17.8
-Poland	1440	361	1089	955	783	2644	1061	2098	1635	966	0.8	7.5	6.9	-2.4	-14.6
-Sweden	3072	534	367	254	224	7108	1135	579	430	355	0.6	2.2	2.5	-45.0	-50.2
-Denmark	1440	843	818	654	683	2696	1707	1368	1214	929	0.7	6.6	6.7	-16.0	-21.9
-Belgium	662	21	152	3041	197	1257	49	205	5973	328	0.6	1.9	2.4	29.1	23.6
-Spain	1688	18	526	698	509	3918	34	732	1460	885	0.6	4.9	6.3	13.4	8.2
-United Kingdom	358	139	93	2657	82	596	334	154	6021	157	0.5	0.8	1.1	0.0	2.3
-Italy	242	731	557	244	324	388	1251	992	418	542	0.6	3.1	3.9	-5.0	-4.2
Med. Countries															

Source: ITC/ PC-TAS

Table 30: Exports of mandarins, clementines and similar fruit (HS080520) from Germany to other countries

Partner country	Value (in 1000 US $)					Quantity (in tonnes)					V/Q in %	Share in % (2003)		Trend in %	
	1999	2000	2001	2002	2003	1999	2000	2001	2002	2003	(2003)	Value	Quantity	Value	Quantity
world	10928	6707	6068	5473	7242	15461	10708	8266	7777	8404	0.9	100.0	100.0	-9.8	-14.3
top 10 partners															
-Poland	2154	686	1023	864	1003	3361	1321	1545	1172	1152	0.9	13.8	13.7	-12.2	-20.2
-Austria	936	956	738	1404	1104	1271	1560	1049	2231	1259	0.9	15.2	15.0	7.4	3.4
-Finland	1091	485	1027	820	1300	1432	709	1500	1252	1574	0.8	18.0	18.7	9.2	7.9
-Sweden	1706	1574	591	146	271	2442	2595	658	227	286	0.9	3.7	3.4	-45.4	-49.0
-France	866	387	625	883	1015	968	485	823	1071	1069	0.9	14.0	12.7	12.1	10.4
-Netherlands	802	420	803	392	795	1083	877	975	514	914	0.9	11.0	10.9	-0.9	-8.4
-Denmark	1452	364	362	277	333	2083	546	448	342	366	0.9	4.6	4.4	-27.5	-32.6
-Italy	470	1016	396	206	131	598	1423	436	238	142	0.9	1.8	1.7	-34.0	-37.3
-Spain	833	85	74	76	726	1146	101	113	156	972	0.7	10.0	11.6	-3.8	1.1
-Czech Rep.	150	170	64	7	149	299	207	123	22	193	0.8	2.1	2.3	-27.4	-26.8
Med. Countries															

Source: ITC/ PC-TAS

Table 31: Exports of lemons and lime (HS080530) from Germany to other countries

Partner country	Value (in 1000 US $)					Quantity (in tonnes)					V/Q in %	Share in % (2003)		Trend in %	
	1999	2000	2001	2002	2003	1999	2000	2001	2002	2003	(2003)	Value	Quantity	Value	Quantity
world	7858	3680	4247	4450	5492	11666	5519	5352	6856	6105	0.9	100.0	100.0	-5.1	-10.2
top 10 partners															
-Austria	2154	700	824	1066	1487	2992	967	959	1510	1542	1.0	27.1	25.3	-3.2	-8.4
-Netherlands	383	442	695	602	1092	556	693	908	874	1223	0.9	19.9	20.0	27.2	19.8
-Spain	2028	22	222	632	23	3545	33	340	1541	30	0.8	0.4	0.5	-42.9	-43.5
-Denmark	421	341	644	565	807	471	464	707	752	977	0.8	14.7	16.0	19.8	21.4
-France	372	299	758	479	473	414	377	1026	608	479	1.0	8.6	7.8	10.0	8.0
-Finland	1018	739	69	39	150	1561	1314	150	82	183	0.8	2.7	3.0	-49.2	-50.6
-Italy	59	268	331	360	441	79	371	408	590	542	0.8	8.0	8.9	54.0	54.0
-Sweden	464	167	269	195	82	623	207	299	225	76	1.1	1.5	1.2	-28.2	-33.8
-Poland	386	152	126	95	130	653	282	209	116	140	0.9	2.4	2.3	-23.3	-32.8
-Belgium	5	3	115	153	562	2	2	89	185	661	0.9	10.2	10.8	281.0	401.7
Med. Countries															

Source: ITC/ PC-TAS

Table 32: Exports of grapefruit (HS080540) from Germany to other countries

Partner country	Value (in 1000 US $)					Quantity (in tonnes)					V/Q in % (2003)	Share in % (2003)		Trend in %	
	1999	2000	2001	2002	2003	1999	2000	2001	2002	2003		Value	Quantity	Value	Quantity
world	4509	3318	5461	5331	5487	7394	6398	7890	9754	5286	1.0	100.0	100.0	9.1	-2.5
top 10 partners															
-Poland	1321	1110	1411	2061	1334	2086	2153	2103	3135	1257	1.1	24.3	23.8	6.6	-6.2
-Netherlands	979	974	1689	1343	1030	1669	2113	2623	2886	1053	1.0	18.8	19.9	4.3	-5.9
-Italy	250	135	634	604	1719	519	347	893	1296	1539	1.1	31.3	29.1	70.8	41.8
-France	673	417	693	361	419	986	623	849	565	456	0.9	7.6	8.6	-10.3	-15.1
-Denmark	354	244	372	153	234	560	426	518	253	271	0.9	4.3	5.1	-12.1	-17.9
-Austria	248	196	233	239	375	352	293	343	356	363	1.0	6.8	6.9	10.8	2.6
-United Kingdom	283	54	105	180	0	482	91	101	408	0	*	0.0	0.0	*	*
-Belgium	195	2	11	19	170	343	4	16	36	167	1.0	3.1	3.2	21.9	7.9
-Sweden	122	41	102	55	47	235	67	127	93	43	1.1	0.9	0.8	-14.9	-26.4
-Greece	0	48	36	187	68	0	80	51	541	51	1.3	1.2	1.0	*	*
Med. Countries															

Source: ITC/ PC-TAS

Table 33: Exports of citrus fruit (HS080590) from Germany to other countries

Partner country	Value (in 1000 US $)					Quantity (in tonnes)					V/Q in % (2003)	Share in % (2003)		Trend in %	
	1999	2000	2001	2002	2003	1999	2000	2001	2002	2003		Value	Quantity	Value	Quantity
world	311	206	244	304	456	350	307	337	258	452	1.0	100.0	100.0	12.2	3.4
top 10 partners															
-Austria	33	51	64	91	118	39	82	80	86	109	1.1	25.9	24.1	36.7	23.4
-Netherlands	67	5	65	66	133	24	5	86	58	145	0.9	29.2	32.1	48.5	83.1
-France	64	60	13	15	100	119	109	34	8	79	1.3	21.9	17.5	-4.8	-29.0
-Denmark	57	45	57	48	18	86	71	109	40	16	1.1	3.9	3.5	-20.1	-32.5
-Sweden	44	30	4	16	71	31	31	2	14	95	0.7	15.6	21.0	3.3	15.5
Med. Countries															

Source: ITC/ PC-TAS

Table 34: Population structure in Germany

		1997	1998	1999	2000	2001	2002	2003
total	million	82.1	82.0	82.2	82.3	82.4	82.5	82.5
<20	million	17.7	17.6	17.5	17.4	17.3	17.1	16.9
	%	21.5	21.4	21.3	21.1	20.9	20.7	20.5
20-30	million	10.5	10.1	9.7	9.6	9.5	9.5	9.6
	%	12.8	12.3	11.9	11.6	11.5	11.5	11.6
30-60	million	36.0	36.0	36.0	35.9	35.8	35.8	35.7
	%	43.8	43.9	43.8	43.6	43.4	43.4	43.3
60-80	million	14.9	15.5	15.9	16.3	16.6	16.7	16.9
	%	18.2	18.8	19.4	19.8	20.2	20.3	20.5
>80	million	3.0	2.9	2.9	3.1	3.2	3.4	3.4
	%	3.7	3.5	3.6	3.8	3.9	4.1	4.2

Source: Statistisches Bundesamt, 2005 b

Table 35: Household structure (in%)

	1997	1998	1999	2000	2001	2002	2003
1-person	35.4	35.4	35.8	36.1	36.6	36.8	37.0
2-persons	32.6	33.0	33.2	33.4	33.6	33.7	33.8
≥ 3-persons	32.0	31.6	31.1	30.6	29.9	29.5	29.2

Source: Statistisches Bundesamt, different years

Table 34: Level of foreign immigration in Germany (in 1000)

	1997	1998	1999	2000	2001	2002	2003
Total	7365.8	7319.6	7343.6	7296.8	7318.6	7335.6	7334.8
Europe	6004.7	5938.6	5930.3	5827.8	5834.7	5816.7	5800.4
European Union	1850.0	1854.3	1858.7	1872.7	1870.0	1862.1	1850
of which Italy	607.9	612.0	615.9	619.1	616.3	609.8	601.3
Greece	363.2	363.5	364.4	365.4	362.7	359.4	354.6
Austria	185.1	185.2	186.1	187.7	189.0	189.3	189.5
Serbia und Montenegro	721.0	719.5	737.2	662.5	627.5	591.5	568.2
Croatia	206.6	208.9	214.0	216.8	223.8	231.0	236.6
Turkey	2107.4	2110.2	2053.6	1998.5	1947.9	1912.2	1877.7
Africa	305.6	303.3	300.6	299.3	303.0	308.2	310.9
America	194.4	199.3	205.4	213.3	218.9	223.9	228.5
of which USA	110.1	110.7	112.0	113.6	113.5	112.9	112.9
Asia	781.0	796.3	823.1	841.7	877.4	901.7	912.0

Source: Statistisches Bundesamt, different years

Table 35: Consumption of frozen food in Germany (in tonnes)[1]

	1997[2]	1998	1999	2000	2001	2002	2003
Total sales							
total of frozen food[3]	1674190	1872570	2016880	2111736	2268897	2307647	2315037
vegetables	360189	377430	394187	408527	432654	431446	433610
-ready to cook vegetable dishes	114073	119275	125115	134443	140704	152072	153108
fruit and fruit juices	52440	61130	59630	64856	66642	60696	60263
Per capita in kg							
total of frozen food	20.5	22.8	24.6	25.9	27.7	28.0	28.1
vegetables	4.4	4.6	4.8	5.0	5.3	5.2	5.3
fruit and fruit juices	0.6	0.7	0.7	0.7	0.8	0.7	0.7
Sales to retail traders							
total of frozen food	965600	1042853	1077887	1133388	1224520	1277431	1274880
vegetables	229314	234735	240055	248196	267504	278716	275298
-ready to cook vegetable dishes	107888	111710	117955	123909	129894	141532	142065
fruit and fruit juices	7940	8100	7855	8973	9862	11436	12284
Sales to HRI							
total of frozen food	708590	829717	938993	986535	1044377	1029686	1040157
vegetables	130875	142695	154132	160331	165150	152730	158312
-ready to cook vegetable dishes	6185	7565	7160	10534	10810	10540	11043
fruit and fruit juices	44500	53030	51775	55883	56780	49260	47979

[1] including direct imports of food retail traders and HRI / includig new federal states, [2] the data are adjusted to current market conditions, [3] without raw meat, wild meat, poultry, ice cream, but including ready to cook side dishes with processed poultry meat.
Source: Deutsches Tiefkühlinstitut e.V, ZMP, 2004b

Table 36: Consumption by purpose

	1997	1998	1999	2000	2001	2002	2003
in billions €							
food, beverages and tobacco	164.3	168.3	173.1	177.6	187.8	190.3	192.7
hotels and restaurants	52.8	53.3	54.7	56.0	56.5	55.8	53.6
other goods and services	806.7	830.3	863.4	894.8	923.5	927.0	938.8
total private consumption expenditure	1023.8	1051.8	1091.2	1128.4	1167.8	1173.1	1185.2
in %							
food, beverages and tobacco	16.0	16.0	15.9	15.7	16.1	16.2	16.3
hotels and restaurants	5.2	5.1	5.0	5.0	4.8	4.8	4.5
other goods and services	78.8	78.9	79.1	79.3	79.1	79.0	79.2
total private consumption expenditure	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Statistisches Bundesamt, 2005 d

Table 37: Consumption in kg of fresh vegetables of German and foreign households, per 100 households in 2003[1]

Type of vegetable	Total	German Households	Foreign households	Foreign in % of German
Salads and leafy vegetables	670	646	982	152.0
stem vegetables	205	213	101	47.0
fruit vegetables	2527	2416	3964	164.0
cabbages	929	935	846	90.0
root vegetables	949	950	926	97.0
bulb vegetables	888	863	1206	140.0
Fungi	113	110	147	133.0
Total	**6414**	**6266**	**8330**	**132.9**

[1] German households have in average 2.25 persons, foreign households 2.72 persons. This means that 20% of the increase is due to the different household size.

Source: ZMP, 2004 b

Table 38: Development according to types or retail trade

Type of retail trade	Number					Turnover (million €)				
	01.01.2000		01.01.2004			2000		2003		
	absolute	%	absolute	%	% change	absolute	%	absolute	%	% change
consumer markets total	7150	10.8	7242	12.6	1.3	47857	49.1	50270	49.8	5.0
self service general stores (≥ 5000 qm)	677	1.0	703	1.2	3.8	15850	16.3	16325	16.2	3.0
big consumer markets (1500 - 4999 qm)	1972	3.0	2181	3.8	10.5	16003	16.4	17220	17.1	7.6
small consumer markets (800 - 14999 qm)	4501	6.8	4358	7.6	-3.2	16003	16.4	16725	16.6	4.5
discount markets	9672	14.6	10266	17.8	6.1	20349	20.9	26030	25.8	27.9
supermarkets (400 - 799 qm)	4730	7.1	4275	7.4	-9.6	12271	12.6	11735	11.6	-4.4
other types (< 400 qm)	44848	67.5	35917	62.2	-19.9	16924	17.4	12865	12.8	-24.0
- big (200 - 399 qm)	5150	7.8	3840	6.7	-25.4	6631	6.8	4610	4.6	-30.5
- medium (100 - 199 qm)	9970	15.0	8530	14.8	-14.4	5353	5.5	4725	4.7	-11.7
- small (< 100 qm)	29728	44.8	23547	40.8	-20.8	4939	5.1	3530	3.5	-28.5
total	66400	100.0	57700	100.0	-13.1	97401	100.0	100900	100.0	3.6
ALDI	3388	4.9	3895	6.3	15.0	16975	14.8	20750	17.1	22.2
total	69788	100.0	61595	100.0	-11.7	114376	100.0	121650	100.0	6.3

Source: A. C. Nielsen, different years

Table 39: Development according to key accounts

	Number					Turnover (million €)				
	01.01.2000		01.01.2004			2000		2003		
Key Accounts	absolute	%	absolute	%	% change	absolute	%	absolute	%	% change
Tengelmann	3556	5.4	3402	5.9	-4.3	7414	7.6	8160	8.1	10.1
Metro EH	787	1.2	720	1.2	-8.5	9817	10.1	9800	9.7	-0.1
Edeka	12524	18.9	11200	19.4	-10.6	22241	22.8	24560	24.3	10.4
REWE	7980	12.0	7250	12.6	-9.1	20758	21.3	21685	21.5	4.3
Spar	8621	13.0	5728	9.9	-33.6	10021	10.3	9030	8.9	-9.9
Markant	13663	20.6	12401	21.5	-9.2	17333	17.8	16615	16.5	-4.1
other stores	19269	29.0	16999	29.5	-11.8	9817	10.1	11050	11.0	12.6
total	66400	100.0	57700	100.0	-13.1	97401	100.0	100900	100.0	3.6
ALDI	3388	4.9	3895	6.3	15.0	16975	14.8	20750	17.1	22.2
total	69788	100.0	61595	100.0	-11.7	114376	100.0	121650	100.0	6.3

1) as long as they are not listed under other organisations; including Aldi, 2) estimations, 3) bakeries, small organisations and independent organisations

Source: A.C. Nielsen, different years

Table 40: Structure and performance of food retail trade in 2001-2003

Type of retail trade	Stores					Turnover						
	2001	2002		2003		2001	2002			2003		
	number	number	(%)	number	(%)	(million €)	(million €)	(%)	per store (1000 €)	(million €)	(%)	per store (1000 €)
chain stores[1, 2]	7838	7941	12	8017	13	35990	38060	32	4793	38710	32	4828
food halls of general stores[2]	105	105	0	103	0	987	960	1	9143	900	1	8911
Edeka-Stores	12560	11695	18	11200	18	22800	24440	20	2090	24560	20	2193
Rewe-Stores	7394	7140	11	7250	12	21310	21470	18	3007	21685	18	2991
Spar-Stores	7229	6572	10	5728	9	10020	9540	8	1452	9030	7	1576
Markant-Stores	13027	12763	20	12401	20	17790	16300	14	1277	16615	14	1340
rest of stores [3)]	17861	17658	28	16999	28	9250	10000	8	566	11050	9	650
total	66014	63874	100	61696	100	118147	120770	100	1891	122550	100	1986

Source: A. C. Nielsen, different years

Table 41: Average turnover per store in 2000 and 2003 (1000 €)

	2000	2003	% change
self-service general stores(≥ 5000 qm)	23412	23222	-0.8
big consumer markets (1500 - 4999 qm)	7915	7893	-0.3
small consumer markets (800 - 14999 qm)	3644	3838	5.3
discount markets	2091	2536	21.3
supermarkets (400 - 799 qm)	2757	2745	-0.4
other stores (< 400 qm)	394	358	-9.1
ALDI	4858	5327	9.7

Source: A. C. Nielsen, different years

Table 42: Top 5 players in each key commercial foodservice sector

Company	2003 turnover in million €	number of outlets
McDonald's	2270	1244
Burger King	504	404
Nordsee	297	367
Aral	132	1134
YUM!	122	123
Total fast food	4135	9368
Lufthansa LSG	727	44
Tank & Rast	498	395
Mitropa	120	203
Gate Gourmet	106	11
Stockheim	102	27
Total Travel	1831	1388
Karstadt	254	212
Metro	232	291
Ikea	100	32
Globus	49	56
Kaufland	23	23
Total Retail	712	684
Moevenpick	103	38
Whitbread	94	66
Kuffler	72	35
Block House	69	40
Kaefer	67	8
Total Full Service	691	373
G & Tanz	59	47
Mitchells & Butlers	57	47
Extrablatt Group	41	41
Europa-Park	41	34
Cinemaxx	40	49
Total Leisure	584	663

Source: RAMOS, 2004

Table 43: Top 10 German gastro service companies

Company	Number of outlets	Turnover 2003 million €	Growth Rate 2003/02 (in %)
McDonald's Deutschland Inc. Munich	1244	2270	-0.4
LSG Lufthansa Service Europe	44	727	1.4
Burger King GmbH, Munich	404	504	9.6
Autobahn Tank & Rast GmbH, Bonn	395	498	1.0
Nordsee Fischspezialitäten GmbH & Co.KG	367	296	-3.7
Karstadt Quelle AG, Essen	212	254	11.3
Metro AG, Duesseldorf	291	232	-0.9
Aral AG, Bochum	1134	132	-8.0
YUM! Restaurants Int´l., Duesseldorf	123	122	2.0
Mitropa AG, Frankfurt a.M.	203	120	3.8
Total turnover gastro service	4417	7952	0.4

Source: RAMOS, 2004

Table 44: Top 5 institutional food services for each segment

Company	2003 sales in millions €	% change from 2002
Compass	484	0.2
Aramark	238	-1.0
Dussmann	112	1.8
Sodexho	97	0.5
DB Gastronomy	69	-12.0
Total restaurants, cafeterias	1321,2	0.2
Dussmann	114	1.8
Schubert	109	18.8
Compass	105	2.6
Klueh Service	86	21.1
SV	46	6.3
Total hospital	648	9.5
Klueh	51	54.5
Victor's Health Care	50	0.2
Dussmann	43	-4.4
Schubert	31	27.8
Apetito	21	10.9
Total nursing/retirement homes	302	14.3
Sodexho	43	7.7
Dussmann	20	11.0
Apetito	10	4.2
Haenchen	7	16.1
GVL	4	0.0
Total schools, universities	91	13.2

Source: RAMOS, 2004

Table 45: Fruit and vegetable wholesale companies in Germany

Mark	Company name	Year	Turnover 1000 US-$	Employees
1	ATLANTA AKTIENGESELLSCHAFT	2003	1641829	5
2	BOCCHI FOOD TRADE INTERNATIONAL GMBH	2002	549729	11
3	ABSATZZENTRALE KREFELD GMBH	2003	518767	
4	DOLE FRESH FRUIT EUROPE OHG	2003	391513	80
5	OGL - FOOD TRADE LEBENSMITTELVERTRIEB GMBH	2003	337865	5
6	FRUCHTIMPORT VAN WYLICK GMBH	2003	277848	290
7	PAUL KEMPOWSKI GMBH & CO. KG	2003	255115	
8	WILFRIED ROSENLAND	2003	239960	93
9	ANTON DÜRBECK GMBH	2003	198282	28
10	H. OLFF & SOHN GMBH	2003	189442	22
11	MERCATO OBST & GEMÜSE HANDELS- UND DIENSTLEISTUNGS GMBH	2003	171837	
12	FRUCHTUNION DUISBURG GMBH	2003	171761	250
13	FRUCHTHOF MEIßEN GMBH & CO.	2003	138924	195
14	WEYERS GMBH	2003	120611	70
15	OTTO FRANCK IMPORT KG	2003	113665	38
16	ANDRETTA FRUCHTIMPORT GMBH	2003	111139	55
17	SEEBERGER KG	2003	107350	145
18	BINDER INTERNATIONAL GMBH & CO. KG	2003	106353	306
19	FRUCHHOF GLEICHMANN GMBH	2001	103942	45
20	DENSCHEILMANN + WELLEIN GMBH	2003	101251	163
21	FRUCHT - EXPRESS IMPORT/EXPORT GMBH	2003	101036	
22	SCHNEIDER GMBH & CO. FRUCHTIMPORT KG	2003	101036	170
23	CONTINENTAL CONCENTRATE CENTRE GMBH & CO. KG	2003	95984	20
24	MERKUR FRUCHT FREIBURG GMBH	2003	95926	
25	MARIANI OF CALIFORNIA (GERMANY) TROCKENFRÜCHTE GMBH	2003	94721	14
26	VITA BETRIEBS-GMBH	2003	93458	382
27	VITA GMBH	2003	93458	730
28	MANSS FRUCHTIMPORT KG	2003	93228	140
29	EXO-FRUCHT GMBH	2003	92012	
30	JOSEF JENNIGES GMBH & CO. KG	2003	90932	70
31	TOGAZ THÜRINGER OBST- UND GEMÜSEABSATZZENTRALE GMBH	2003	86396	
32	FRUCHTHANSA GMBH	2002	84178	124
33	ROSENBAUM VERWALTUNGS GMBH	2003	83354	55
34	DINTER GMBH	2003	82091	
35	ELBE-OBST ERZEUGERORGANISATION R.V.	2002	76711	
36	KROHN AGRAR GMBH & CO. KG	2003	75777	50
37	DIRECT FRUIT MARKETING DFM GMBH	2002	75525	20
38	AGRATA AGRARHANDEL GMBH & CO. KG	2003	73822	55
39	HARS & HAGEBAUER MARKT GMBH	2003	73756	52
40	AFRIKANISCHE FRUCHT-COMPAGNIE GMBH	2003	73251	20
41	FRÜCHTE JORK GMBH	2003	71988	85
42	FRUCHTPARTNER GESELLSCHAFT FÜR EUROPÄISCHEN FRUCHTHANDEL MBH	2003	69462	15
43	HEINRICH BRÜNING GMBH	2003	69462	13
44	PETER VETTER GMBH	2003	69462	22
45	REIMER HAUSCHILDT GMBH GEMÜSEVERMARKTUNG UND LOGISTIK	2002	67675	109

Table 45: continued –2-

Mark	Company name	Year	Turnover 1000 US-$	Emplo-yees
46	AGREXCO AGRICULTURAL EX-PORT COMPANY LIMITED ZNDL. FÜR EUROPA IN FRANKFURT	2003	67474	32
47	KROHN HOLDING GMBH	2002	66068	57
48	KRÄUTER MIX GMBH	2003	64410	240
49	FRUCHTAGENTUR AGNES ROSENLAND IMPORT-EXPORT	2003	63147	3
50	HERBERT VAN DER HAMM FRUCHTHANDELSGESELLSCHAFT MBH	2003	63073	
51	EUROPLANT PFLANZENZUCHT GMBH	2003	62804	50
52	ALBRECHT HAHN GMBH & CO. KOMMANDITGESELLSCHAFT	2003	59358	25
53	ANDREAS KUPFER & SOHN GMBH	2003	56833	75
54	AUGUST JAEGER NACHF. GMBH & CO. KG	2003	56833	140
55	KÄRCHER GMBH & CO. KG FRUCHT-IMPORT, GROßHANDEL	2003	56833	78
56	MFL - MÜNSTER FRUIT LOGISTICS GMBH	2003	53554	20
57	GEMÜSERING STUTTGART GMBH	2003	53044	15
58	"CORDIS" OBST- UND GEMÜSEGROßHANDEL GMBH	2003	50518	79
59	EK SÜDFRUCHT GMBH	2003	50518	3
60	HABECO-FRUCHTHANDEL GMBH	2003	50518	60
61	HEINZ KORFF GEMÜSEVERSAND GMBH	2003	50518	38
62	MARKTVERTRIEB DIETER SCHWERIN GMBH	2003	50518	26
63	NEUENFELDT & DETERS G.M.B.H.	2003	50518	2
64	HAUSLADEN FRUCHTHANDELS GMBH	2003	49255	70
65	SAVID EUROPA GMBH	2003	49255	1
66	AUGUST LEHMANN GMBH & CO. KG	2003	48587	44
67	ELSDORFER FEINKOST AKTIENGESELLSCHAFT	2003	48156	135
68	AGRISERVICE IMPORT UND EXPORT LANDWIRTSCHAFTLICHER PRODUKTE GMBH	2003	47992	6
69	KLAUS BÖCKER GMBH	2003	47992	16
70	LUIGI DI LENARDO -GMBH & CO. KG	2003	46097	
71	SCHUMMER - FRUCHTHANDELSGESELLSCHAFT MBH	2002	45330	
72	RUMPLER-FRUCHTHOF LEUTENBACH-FRÄNKISCHE SCHWEIZ GMBH	2003	44203	45
73	VITA-NUT GMBH & CO. KG	2003	44203	75
74	FRANCE CHAMPIGNON GMBH	2003	42940	
75	ONKEL-SAHINGÖZ GMBH & CO. KG	2003	42940	5
76	OGV - OBST- UND GEMÜSEVERTRIEBS-GMBH	2003	42242	38
77	MACOO OBST-, GEMÜSE- UND BLUMENHANDEL GMBH	2003	41786	3
78	WIESENHOF-PILZLAND VERTRIEBSGESELLSCHAFT MBH	2003	41677	
79	J. A. KAHL GMBH & CO.	2002	40818	73
80	EDM. ROMBERG & SOHN GMBH & CO. KG KONSERVEN-IMPORT	2003	40035	
81	HIMBERT GMBH	2002	39918	7
82	AFS ATLANTA FINANZ SERVICE GMBH	2002	39851	75
83	V O G VERMITTLUNGS- UND HANDELS-GESELLSCHAFT FÜR OBST UND GEMÜSE MBH	2002	39196	
84	FRUCHT-AGENTUR IBERIA GMBH	2003	37965	
85	ADAM THEIS GMBH	2003	37888	100
86	GRUNDHÖFER GMBH	2003	37888	41
87	WILLI SINN FRÜCHTEGROßHANDEL GMBH	2003	37888	21
88	FRUCHTHOF DRESDEN & CO. GMBH	2003	36195	
89	HANS A. WÜST GMBH	2003	35285	52
90	MORENO GMBH & CO KG	2003	33663	23

Table 45: continued –3-

Mark	Company name	Year	Turnover 1000 US-$	Emplo-yees
91	"DONAU"-GEMÜSE-HANDELS GMBH	2003	32837	8
92	KÜSTEN GEMÜSE GMBH	2003	32837	20
93	WEIHE FRÜCHTE & SALATE KG	2003	32837	90
94	GUSTAV WULFF GMBH	2003	31574	17
95	HAVITA FRISCHSALATE GMBH	2003	31574	206
96	MATTHIES & SÖHNE FRUCHTIMPORT GMBH	2003	31574	94
97	PAKO IMPORT-AGENTUR GMBH	2003	31574	2
98	SCHRAUD & BAUNACH GMBH OBST GEMÜSE SÜDFRÜCHTE	2003	31574	30
99	VEOS VERTRIEBSGESELLSCHAFT FÜR OBST MBH	2003	31574	1
100	FRUTOS FRUCHTHANDELSGESELLSCHAFT MBH	2003	31068	30
101	PETER KEUTHMANN GMBH & CO. KG	2003	30691	42
102	HINRICH HEY (GMBH & CO.)	2003	30311	30
103	VON KROGE & CO. FRUCHTHANDEL GMBH	2003	30311	20
104	JAKOB ROSENBAUM BANANENVERTRIEBS-GMBH	2003	30184	50
105	STEINKRÜGER FRUCHTIMPORT BIELEFELD GMBH	2003	28524	50
106	ALFRED ZINDEL AG	2003	28416	30
107	LAPRO HANDEL MIT LANDWIRTSCHAFTLICHEN PRODUKTEN GMBH	2002	27946	
108	AGRARHANDEL KUNZ GMBH	2003	27785	19
109	OGS OBST- UND GEMÜSEVERTRIEB SÜDBADEN GMBH	2003	27658	30
110	BIO TROPIC GESELLSCHAFT ZUR ERZEUGUNG UND ZUM VERTRIEB ÖKOLOG. PRODUKTE MBH	2003	27469	9
111	LEO SAVELSBERG GMBH & CO. KG	2003	27153	4
112	ENRIQUE MASIA MORENO GMBH	2003	26522	10
113	MACOO RADEFELD GMBH OBST- GEMÜSE-BLUMENGROßHANDEL	2003	25734	36
114	EFG ELCHINGER FRUCHT- UND GEMÜSEVERTRIEBS GMBH	2003	25374	
115	GEMÜSEGROßHANDEL R. + C. BEHR OHG	2003	25259	3
116	RAINER BAUSCH GMBH	2003	25259	21
117	RAUTENBERG-HÖLTING FRUCHTIMPORT GMBH	2003	25259	22
118	RICHARD PICKENPACK GMBH & CO. KG	2003	25259	40
119	SIEGFRIED ZELGER GMBH	2003	25259	20
120	W. KRETSCHMER GMBH & CO. KG	2003	25259	28
121	SELIMEX VERTRIEB GMBH	2003	25115	4
122	WERDER FRUCHT VERMARKTUNGSGESELLSCHAFT MBH	2003	24442	
123	A. LEHMANN FRUCHTAGENTUR GMBH	2003	23996	5
124	FRANZ SCHMITT OBST- UND GEMÜSEGROSSHANDEL - IMPORT GMBH & CO. KG	2003	23996	18
125	ALBIS TROCKENFRUCHT HANDELSGESELLSCHAFT MBH & CO.	2003	23870	3
126	STAIGER GMBH	2003	23556	65
127	ERZEUGER GROßMARKT GARTENBAU EG. OSNABRÜCK	2003	23358	
128	VALENZI GMBH & CO.KG	2003	23238	100
129	WERNER LEDERGERBER GMBH & CO. KG	2003	22733	4
130	T. PORT (GMBH & CO.)	2003	22314	2
131	RHEINISCHE KONSERVENFABRIK GEORG SEIDEL GMBH & CO. KG	2003	22102	90
132	WERNER EBERT GMBH & CO.KG	2003	22102	31
133	DANKERS & VAN RIJN HANDELSGESELLSCHAFT MBH	2003	21470	2
134	FLC FRUCHTHANDELSGESELLSCHAFT MBH & CO. KG	2003	21470	40
135	FRUCHT-SERVICE, FRUCHTHANDELS UND -TRANSPORTE GMBH	2003	21470	95
136	FRUCHTIMPORT-GROßHANDEL HEINRICH HODORFF GMBH	2003	21470	25
137	VKV KARTOFFELVERTRIEBSGESELLSCHAFT MBH	2003	21470	60
138	FRUCHTEXPRESS TS GMBH	2003	21327	70

Table 45: continued –4-

Mark	Company name	Year	Turnover 1000 US-$	Emplo-yees
139	MICRO FRUCHT HANDELS OHG	2003	21059	17
140	CARE NATURKOST GMBH & CO. KG	2003	20839	35
141	LEHMANN NATUR GES. ZUR ERZEUGUNG UND ZUM VERTRIEB ÖKOLOGISCHER PRODUKTE MBH	2003	20605	11
142	FRÜCHTEDIENST WEST GMBH	2003	20440	
143	PAX-AN NATURWAREN-HANDELSGESELLSCHAFT MBH	2003	20217	70
144	BPV BRANDENBURGER PILZVERTRIEB GMBH	2003	20207	2
145	BUNNFRUCHT GMBH	2003	20207	
146	LINDNER GMBH FRUCHTIMPORT UND HANDELSGESELLSCHAFT	2003	20207	25
147	WILHELM HARTMANN OBST- UND GEMÜSEHANDEL, VERSAND, PRODUKTION.. GMBH & CO. KG	2003	20207	35
148	RHEINLANDFRUCHT GMBH	2002	19925	1
149	MARIO ANDRETTA & CO. FRUCHTHANDELSGESELLSCHAFT MBH	2003	19702	20
150	SOLFRUIT GMBH FRUCHTHANDELS-AGENTUR	2003	19576	4
151	SUHR'S FRUCHTIMPORT GMBH	2003	19576	42
152	ALBRECHT & BIRKEFELD (GMBH & CO.)	2003	18944	1
153	ANDERS GMBH & CO. PRODUKTIONS- UND VERTRIEBS KG	2003	18944	5
154	CHAMPIGNON HANDELSGESELLSCHAFT ROSBACH CHAMPGRO MIT BESCHRÄNKTER HAFTUNG	2003	18944	30
155	DDV - FRÜCHTE-HANDELS GMBH	2003	18944	6
156	FERNANDO CABALLERO-VIDAL OBST- UND GEMÜSEGROßHANDEL	2003	18944	4
157	THOMAS RINK IMPORT-EXPORT KG	2003	18944	5
158	GROßMARKT BREMEN GMBH	2003	7422	42
	Total		**11755675**	**7651**

Source: AMADEUS databank

Table 46: Fruit and vegetable retailers in Germany

Mark	Company name	Last Year	Turnover 1000 US-$	Emplo-yees
1	BOFROST* JOSEF H. BOQUOI DEUTSCHLAND WEST GMBH & CO. KG	2001	479559	2418
2	ERZEUGERORGANISATION FÜR OBST UND GEMÜSE MECKLENBURGER ERNTE GMBH	2003	117128	4
3	FRUVA FRUCHTIMPORT GMBH & CO. KOMMANDITGESELLSCHAFT	2003	44203	7
4	FRUCHTHANDELSGESELLSCHAFT MBH CHEMNITZ	2003	30925	41
5	ANDREAS KUPFER & SOHN GMBH	2003	23327	15
6	VINCENZO ANDRONACO E.K.	2003	20831	47
	Total		**715973**	**2532**

Source: AMADEUS databank

Table 47: Fruit and vegetable processing enterprises (juice) in Germany

Mark	Company name	Last Year	Turnover 1000 US-$	Emplo-yees
1	FRUCHTQUELL GETRÄNKEINDUSTRIE GMBH & CO. KG DODOW	2003	143239	420
2	ECKES-GRANINI GMBH & CO. KOMMANDITGESELLSCHAFT	2001	110393	
3	NATURELLA GETRÄNKE GESELLSCHAFT MBH & CO. KG	2003	97247	90
4	JAHNCKE FRUCHTSÄFTE-KONZENTRATE GMBH & CO. KG	2003	85249	100
5	FSP FRISCHSAFT FRISCHE PRODUKTIONSGESELLSCHAFT MBH	2003	81368	140
6	NIEHOFFS VAIHINGER FRUCHTSÄFTE GMBH	2003	60020	
7	BECKER'S BESTER GMBH & CO. KG	2003	52025	170
8	GLOCKENGOLD FRUCHTSAFT GMBH	2003	51886	75
9	MAINFRUCHT GMBH & CO. KG	2003	49936	74
10	A. DOHRN & A. TIMM GMBH & CO. KG	2003	44203	78
11	MERZIGER FRUCHTGETRÄNKE GMBH	2003	41786	
12	ELMENHORSTER FRUCHTSAFTGETRÄNKE GMBH	2003	40964	104
13	HAUS RABENHORST O. LAUFFS GMBH & CO. KG	2003	35362	96
14	ERNTEBAND FRUCHTSAFT GMBH	2003	35220	57
15	KUMPF FRUCHTSAFT GMBH & CO KG	2003	32837	110
16	WOLFRA KELTEREI GESELLSCHAFT MIT BESCHRÄNKTER HAFTUNG	2003	32837	76
17	BONJUICE GMBH	2003	25259	14
18	WALTHER SCHOENENBERGER, PFLANZENSAFTWERK GMBH & CO.	2003	24754	105
19	AMECKE FRUCHTSAFT GMBH & CO. KG	2003	23996	42
20	BECKER GMBH & CO. EISLEBENER FRUCHTSAFT OHG	2003	23046	45
21	VOELKEL GMBH	2003	22455	75
22	HERBSTREITH & FOX GMBH PEKTIN-FABRIK WERDER	2003	19576	80
23	EMIG GMBH & CO. KG	2003		600
24	SCHWÄBISCHE FRUCHTSAFT GMBH	2003		350
	Total		**1133658**	**2901**

Source: AMADEUS databank

Table 48: Fruit and vegetable processing enterprises in Germany

Mark	Company name	Last Year	Turnover 1000 US-$	Emplo-yees
1	FRANZ ZENTIS GMBH & CO. KG	2003	694620	1500
2	STUTE NAHRUNGSMITTELWERKE GMBH & CO. KG	2003	694620	3
3	F. GÖBBER KG	2003	189442	289
4	ALBI GMBH + CO.	2003	117451	154
5	OBST- UND GEMÜSEVERARBEITUNG "SPREEWALDKONSERVEN" GOLßEN GMBH	2003	79390	455
6	ODENWALD-KONSERVEN GMBH	2002	70987	241
7	WINSENIA NAHRUNGSMITTELWERKE GMBH	2002	52435	76
8	BAYERNWALD FRÜCHTEVERWERTUNG GMBH	2003	48971	
9	WARBURGER NAHRUNGSMITTELWERKE KURT HOLLBACH GMBH	2003	47360	15
10	WALTER POTT GMBH & CO. KG	2003	44203	50
11	GEWIKO GERWISCHER FEINKOST-KONSERVENFABRIK GMBH	2003	37888	170
12	LAUSITZER FRÜCHTEVERARBEITUNGS GMBH	2003	37888	125
13	GRAFSCHAFTER KRAUTFABRIK JOSEF SCHMITZ KG	2003	32837	90
	SPREEWALD-FELDMANN GMBH & CO.KG	2003	32000	114
14	MÜHLHÄUSER KONFITÜRE GMBH & CO. KG	2003	29048	74
15	KUGLER FEINKOST GMBH	2003	20839	120
16	DR. WILLI KNOLL GMBH & CO. KG	2003	20207	30
17	DEUTSCHE NÄHRMITTEL-GESELLSCHAFT WOLBER & BRÜCKNER	2003	18944	5
18	DIAFOOD ROHSTOFFHANDELS GMBH	2003	18944	18
19	JÜTRO KONSERVENFABRIK GMBH & CO. KG	2003	18944	60
	Total		**2307018**	**3589**

Source: AMADEUS databank