Guidelines for Exporters of Spices to the European Market

Export Market Development Department
Commonwealth Fund for Technical Co-operation
Commonwealth Secretariat

Commonwealth Secretariat
1996

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This is one of a series of publications providing practical
guidelines on exporting for the benefit of
Commonwealth producers

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American Spice Trade Association
Association "La Route des Epices"
European Spice Association
Fachverband der Gewurzindustrie e.V.
International General Produce Trade Association
International Organisation of the Flavours Industry
International Standards Organisation
International Trade Centre
Netherlands Spice Trade Association
Syndicat National des Transformateurs
des Poivres,Épices, Aromates et Vanille
Verbandegruppe Ernarhrungs-Industrie e. V

The contribution of all of the above and several others who were interviewed during the process of compiling these guidelines is highly appreciated and gratefully acknowledged.

ACRONYMS

ACP	African, Caribbean and Pacific Countries
AFNOR	Association Française de Normalisation
ASTA	American Spice Trade Association
BSI	British Standards Institute
CCE	Commission des Communautés Européennes
CEN	Comité Européene de Normalisation
CIS	Commonwealth of Independent States
CPI	Centre for the Promotion of Imports
DIN	Deutsches Institut fur Normung
EOA	Essential Oils Association of America
ESA	European Spice Association
EU	European Union
EUCOFEL	Union Européene du Commerce de gros, d'expedition, d'importation en Fruits et Legumes
FAO	Food and Agricultural Organisation
FEMA	Flavors and Extract Manufacturers Association
IGPA	International General Produce Association
IOFI	International Organisation of the Flavours Industry
IPC	International Pepper Community
ISO	International Standards Organisation
ITC	International Trade Centre
MRLs	Maximum Residue Levels
NNI	Nederlands Normalisatie Instituut
SNPE	Société National des Poivres et Épices
WHO	World Health Organisation

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Introduction

The evolution of the European spice industry follows closely that of European colonial history in the 17th and 18th centuries. Wherever colonies were established the cultivation and trade in spices rapidly developed. Indeed the search for new sources of spices and securing the trade routes to these regions was a major reason for colonial exploration, conquest and intra-European trade rivalry. French, English and Dutch involvement in the Caribbean, the Indian sub-continent, the East Indies and the Indian Ocean Islands was intimately linked with the spice trade. Many of the former British colonies, now independent Commonwealth nations, have been involved in spice production and trade for hundreds of years. Exports of spices are today of major importance to the economies of Commonwealth countries such as India, Sri Lanka, Grenada, Jamaica, Tonga and Tanzania.

Although the European spice industry has undergone substantial changes since these early developments, the product range and the global pattern of trade has not altered radically. Five spices pepper (black and white), capsicums (including paprika, chillies and pimento), vanilla, cinnamon/cassia and saffron - dominate the trade.

Origins of supply include Indonesia, the major source of spices into the EU, supplying pepper, nutmeg and cinnamon. Morocco is the second most important exporter to the EU, supplying paprika, coriander, saffron, fennel and a range of other products. Madagascar, the third largest exporter, provides pepper, vanilla, cinnamon, and cloves. Only three other countries are significant suppliers: India, Turkey and Brazil. Variations between member states in their sources of supply is still marked, although with the integration of the EU into a single market this is declining. There is still a tendency for countries with ex-colonies to import a large proportion of their supplies from these origins.

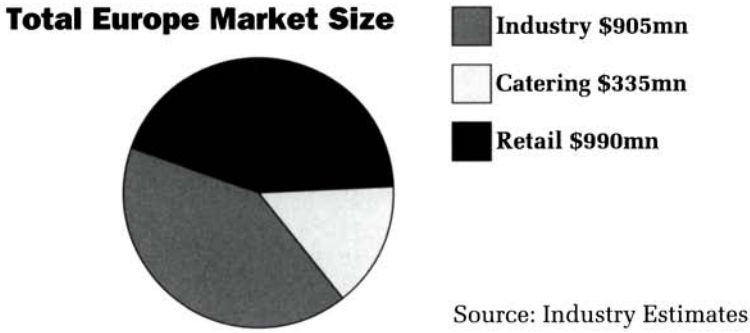
This handbook does not cover all spices; it concentrates on those which are either important in terms of volume and value or where opportunities for new entrants are considered better than average. Products like cloves and nutmeg have not as a result been included while other smaller items like saffron have been listed because of potential opportunities for new suppliers.

In the retail markets, spices are generally sold pre-packed in ground or whole form. These usually take the form of glass bottles or cardboard packets. Refills are available for many of the products. In some grocery stores and health food shops spices are sold in open sacks. Customers bring their own containers. More and more spices are being sold in the form of spice mixes or sauces. Pourable sauces is the fastest growing area in the spice retail sector.

Because of environmental and health concerns there has been a growth in the sale of organic herbs and spices. Although it is the fresh organic herb

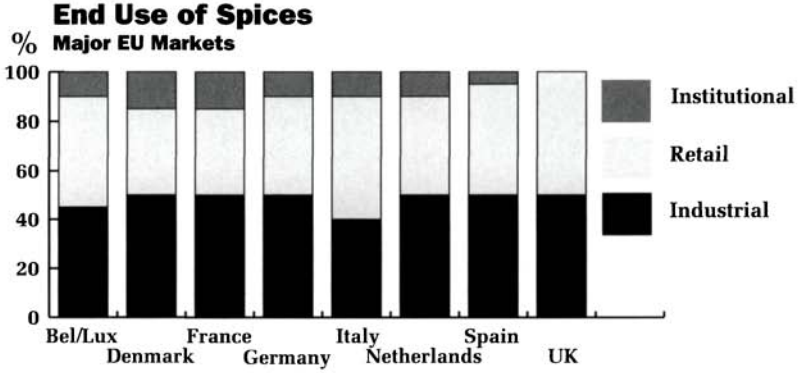
market which is growing fastest, there is no doubt that organically certified spices will be seen more and more on the market. At present none of the major brands have entered this field largely because of lack of assured quality suppliers. Another related development has been that of "diet spices": low sodium, low calorie or fat-free sauces and seasonings.

Table 1



Source: Industry Estimates

Table 2



There is a continuing debate over the merits and demerits of processing and packing spices at origin. Technically there are few constraints to local proccessing, although EU tariffs provide some form of trade barrier. The main area of concern is over quality control. Increasingly stringent EU-wide food safety laws make it more and more difficult for new producers, be they overseas or in Europe, to afford the cost involved in setting up quality control systems. These have become one of the most important cost

elements of the spice trade. The large multinationals like McCormick and Burns Philp encourage processing at source and have set up joint ventures in places like India, Indonesia, Mexico and Brazil to provide ground spices in bulk, particularly pepper, chillies and paprika.

The sale of retail pack spices from origin is not expected to grow substantially. Apart from the health and safety issue, suppliers need to offer a complete range of perhaps 20 to 50 different products and must spend very sizeable sums of money on advertising and promotion. This cannot be done from outside the EU. An alternative strategy is for overseas producers to invest in processing facilities within Europe.

In the case of spice extracts, particularly oleoresins, production at origin is of growing importance. The growth in the industrial processing of spices has paralleled that of the ready-to-eat food and beverage business. Wherever spicy flavour ingredients are required for application to food and drink products, spice extracts either in the form of oleoresins, essential oils, encapsulated spices or occasionally spray dried products are used. The objective of spice processing of this kind is to extract the aromatic and pungent principles from the spices in order to produce a concentrated product of uniform colour and flavour. The additional advantage is that the product hygiene can be strictly controlled and it can be easily stored and transported.

The European spice industry is going through a period of consolidation and concentration. Importing and processing is being handled by fewer and fewer large companies. Many are operating on a European or worldwide scale. The buying power of these companies puts the small grower and exporter in the Commonwealth at a considerable disadvantage in the bargaining process. To counteract this, growers will themselves have to start to work together and build long term links with these major concerns.

As more and more big European spice houses source their raw materials directly in the countries of origin, there will be increasing contracts between growers and producers and consequently quality controlled growing. Such collaboration can be as joint ventures and involve investment on the part of the spice producer in the growing country, as is already done for paprika, onions and garlic and other raw materials for the industry. The advantages for both sides are obvious: increased influence over the raw material quality on the part of the spice processor and guaranteed prices, transfer of know-how and technology for the suppliers in the country of origin. Frequently the foreign partner also invests in improved agricultural production facilities and in cleaning and drying and quality control laboratories.

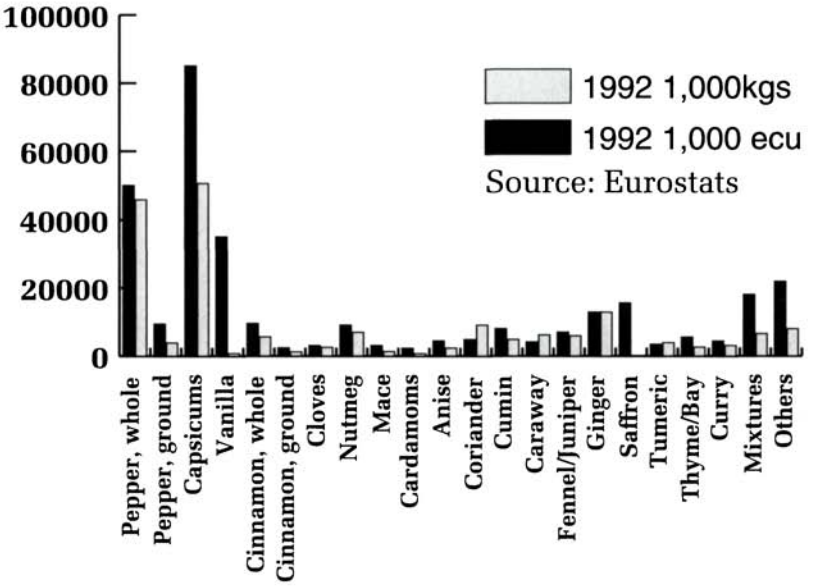
Market Size

The European herb, spice and seasoning market is estimated at ECU 1,675.9 million (US$ 2,229 million): 44% of this is represented by the retail trade, 41% by spices for industrial use and the remaining 15% goes into catering (see Table 1). There is considerable variation between member states largely dependent on the importance of the processed food sector. In all cases the industrial and institutional (catering) sector combined exceeds the retail trade. This trend is expected to continue (Table 2).

The volume of spices imported into the EU is around 178,000 tonnes (valued at ECU 320 million). This has grown from around 151,000 tonnes in

Table 3

EU Imports of Major Spices (Volume and Value)



1989 (valued at ECU 287 million). By far the most important product in terms of volume is pepper. In terms of value capsicums (paprika, chillies and pimento) is the most important group of spices traded (Table 3). The most important consumer of spices is Germany with 30% of sales and 30% of imports. France is the second largest consumer with 13% of sales and 15% of imports. The Netherlands, the UK and Spain are the other main

consumers and importers of spices. Together these countries account for over 70% of the market (Table 5).

The three new EU member states - Austria, Sweden and Finland - are not very significant importers of spices and obtain most of their supplies from other EU states.

Taken collectively, Indonesia is the major source of spices into the EU (mainly pepper, nutmeg and cinnamon). Morocco is the second most important exporter, supplying paprika, coriander, saffron, fennel and a range of other products. Madagascar, the third largest exporter, provides pepper, vanilla, cinnamon and cloves. Only three other countries are significant suppliers: India, Turkey and Brazil (see Table 4).

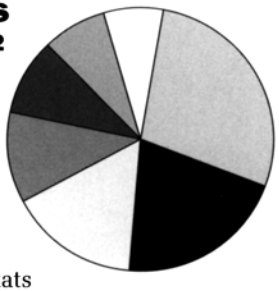
Development

Although historically the spice industry in each of the main European nations developed largely independently, the creation of the European Union has done much to encourage its integration. Rotterdam, Hamburg, London and Marseille have traditionally been the main entrep(t centres for spices and many of the biggest importers are based in these cities. Some of these traders have themselves diversified into the processing and packing of spices. The majority of these companies are involved in importing other commodities and foodstuffs. Some, however, specialise almost exclusively in one or two particular spices. All now operate on a European-wide basis (Table 6).

Apart from the large trading houses there are, throughout Europe, a series of small importers (often of ethnic origin) who supply either whole or ground spices to health food shops, small grocers and market traders. As health

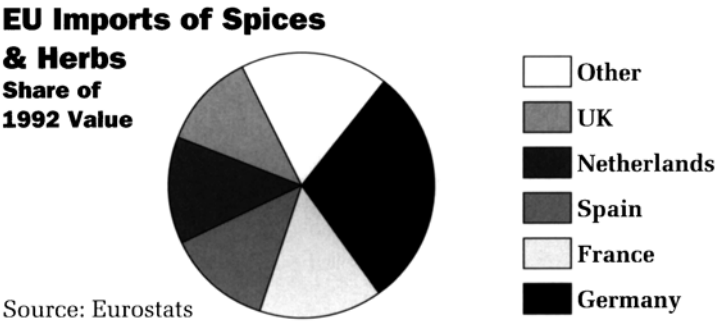
Table 4

EU Imports of Spices and Herbs
By Value 1992



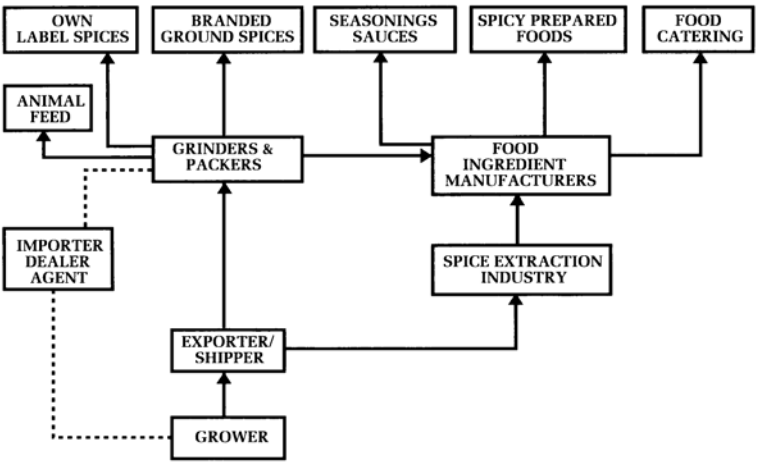
Source: Eurostats

Table 5



Source: Eurostats

TABLE 6 - STRUCTURE OF THE SPICE INDUSTRY



and sanitary legislation becomes more rigorous it will be more and more difficult for these small companies to survive. They are presently the target of much criticism concerning quality control and product testing methods.

Most spice grinders and packers in Europe were originally established as small family concerns. Many of them have now been sold to large, often multinational companies, specialising in spices and other food ingredients. The consolidation of the industry is taking place very rapidly. Small companies can no longer afford the very high capital costs of new processing and packing machinery and above all sophisticated testing and quality control equipment. Probably of greater importance is the growing cost of marketing and promotion. Only the larger food manufacturers can

afford the enormous advertising and promotion costs involved in selling branded products. The market is increasingly dominated by two food groups: McCormick Inc. of the USA (turnover ECU 1.27 billion), the world's largest spice company, and Burns Philp and Co of Australia (turnover ECU 2.1 billion), which has become, through the acquisition of Ostmann in Germany, Euroma in the Netherlands and British Pepper and Spice in the UK, the largest supplier of spices in Europe. These two concerns are estimated to control more than 25% of the European market. Other major companies in Europe include Fuchs (which operates in Germany and France) and Ducros (which operates in France and Spain). CPC International, a large US company, also has interests in spices throughout Europe. Many of the smaller companies prefer to supply to the catering trade or pack on contract for the supermarkets.

Processing Sector

The spice extraction industry, producing spice oils, oleoresins or concentrated spice extracts and flavours, is now mainly in the hands of companies manufacturing a range of food ingredients or flavours and fragrance compounds. Food ingredient manufacturers will produce such products as colorants, stabilisers, gum resins and emulsifiers as well as spice extracts. Many of these are still small independent firms (e.g. East Anglia Food Ingredients, UK, or Aralco, France). The industry reports a slow trend away from processed spice extracts to the natural product. People prefer to see the spices and herbs they are consuming in processed foods rather than taste invisible flavours.

Institutional Sector

The flavours and fragrance companies almost all now operate on a global scale, producing customised flavour compounds for the large food manufacturers. Ten companies have more than 70% of this market worldwide. They include Quest (part of Unilever), Haarmann & Reimer (part of Bayer), Givaduan (part of Hoffmann Laroche) and International Flavors and Fragrances.

The rapid growth in convenience foods and the spread of fast-food chains will have a powerful influence on the future structure and direction of the spice industry. The ready-to-eat food and catering sector are in many cases larger consumers of spices and spice products than the household market. Many of the spice processors are themselves diversifying into food processing and food ingredient manufacturing. Companies like McCormick, Kuhne and Amora all supply pickles, relishes and mayonnaise as well as a wide range of pourable spice sauces. It is in this area, not in packaged spices, that most observers see growth in the market.

Germany

Germany is much the largest market for spices in Europe. The estimated value of sales of spices, herbs and related produces is ECU 503 million, representing 30% of the EU market. There are more than 60 companies that are involved in the grading, packing and processing of spices, with another 15 or more importers and distributors. Germany is also the largest importer, accounting for around 30% of the ECU 320 million European import market. Because of the central role it plays in both the packaged and industrial spice sector Germany tends to set the pace in terms of legislation, business practices, research and development.

Between 1987 and 1994 the German spice industry increased its production of spices, seasonings, herbs and related products from 46,000 to 80,000 tonnes The value of sales also rose from ECU 327.8 million to ECU 470.0 million. Despite this industrial growth, imports of raw spices have not grown significantly in the last five years. Imports in 1994 at around 50,000 tonnes were only 2,000 tonnes more than in 1990. The value of imports has also remained more or less constant (ECU 107 million in 1990 and ECU 108.5 million in 1994).

Pepper is the major product with imports of 16,000 to 17,000 tonnes (31% of EU imports). The second most important spice is paprika with imports of around 10,000 to 12,000 tonnes (35% of EU supplies). In value terms vanilla is the third major product imported (35% of EU imports). All other products imported are relatively small by comparison (see Table 7).

German households have the highest per capita consumption of spices in Europe. Spiced bread and bakery products are widely consumed - hence the high consumption of cinnamon/cassia (33% of EU imports), caraway seed (52% of EU imports) and cumin. The Germans are also the largest producers and consumers of processed meat products. These require a wide range of spices for both flavouring and colouring purposes. Most important of these is paprika. Germany is also the largest market for herbal teas in Europe. This give rise to a substantial demand for spices like fennel, anis and lemongrass which are used to produce tisanes.

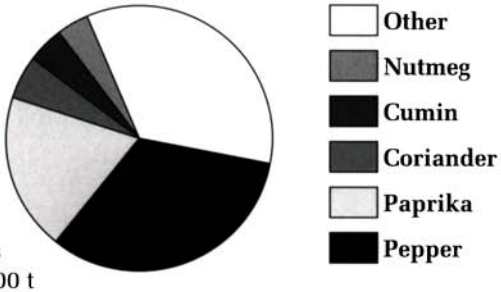
Germany is also a major exporter of spices and spice products. Exports are between 10,000 and 11,000 tonnes annually, particularly pepper, paprika, vanilla and mixed spices

There is a growing concentration of retailing in the hands of the supermarkets, with European giants like Tengelmann, Metro and Rewe becoming increasingly important (ten companies account for 70% of turnover). In addition, discount stores like Aldi operate throughout Europe. A similar concentration has taken place in the food processing and catering sector. This has given rise to a corresponding rationalisation process amongst the producers and processors of spices.

Despite the increase in the size of the industry due to the absorption of the old East German spice industry the number of processors has declined from around 75 in 1970 to 60 today. Ten companies today process 75% of the spices produced and imported into Germany. The turnover of the largest companies in this sector range between ECU 25 million and ECU 100 million.

Table 7

German Spice Imports
1994



Source:
Trade Statistics
Total Vol: 50,500 t

The number of importers has also declined either because they have diversified into processing and packing or have merged or been acquired. Many of the traditional Hamburg or Bremen based importers like Cornhels and Bosse or Henry Lamotte import a wide variety of products other than spices. Others importers specialise in one or two commodities only, like Jost Bauer (paprika) and Aust & Hachmann (vanilla). Although German importers dominate the European market for vanilla, paprika and cumin, German spice processors also often obtain their supplies from importers in London and Rotterdam. The larger companies also import direct, sometimes from their own operations (e.g. Fuchs in Brazil).

Multinational companies have been very active in Germany, with CPC International (US owners of Ubena), Burns Philp (Australian owners of Ostmann), BSN (France) and Ferruzzi (Italy) all investing heavily in spices. McCormick is also keen to enter the German market but early attempts have been blocked by EU monopoly legislation.

Despite the fact that Germany is a federal state with strong regional variations in taste, three or four major brands still dominate the sector. The remainder is sold by a multitude of small producers. Ostmann is the brand leader (around 40% of the market), followed closely by Ubena and Fuchs. Other nationally important brands are Alba and Wagner. There is strong competition between these companies to capture market share by means of price cutting, market promotion and new production development. Own brand product is developing, albeit more slowly than in France or the UK

(see Table 8).

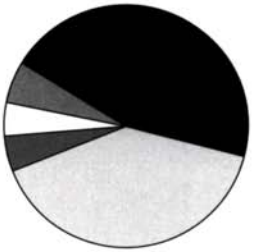
The processing of spices for industrial use is extremely important in Germany. Along with the catering sector this represents more than 60% of the total turnover of the spice industry. Some companies like Haarmann & Reimer and Dragoco are multinational flavour and fragrance houses. Others like Raps, Hermann Laue, AVO and Moguntia concentrate almost entirely on serving the industrial spice market.

Health food stores and small grocery stores also sell spices and herbs. These are sometimes sold loose or in simple packages. There is increasing concern amongst the industry as to whether these smaller outlets are able to abide by the stringent health and safety checks now required by law to prevent outbreaks of food poisoning. The industry was badly affected by the discovery of salmonella, aflotoxin and heavy metal contamination of spices sold in Germany. Against this background, health and safety issues dominate all discussions with prospective importers. A series of new food laws are being drafted to prevent further occurrences.

The German Spice Industry Association has over 60 full-time and 7 associate members. All the main producers belong to the Association, which is part of the German Federation of Food Ingredient Manufacturers (Verbandsgruppe Ernaehrungsindustrie). This organisation works closely with the BLL (Bund fur Lebensmittelrecht und Lebensmittelkunde) and the ESA (European Spice Association) to improve spice standards and promote the safe use of spice products.

Table 8

UK Market Shares

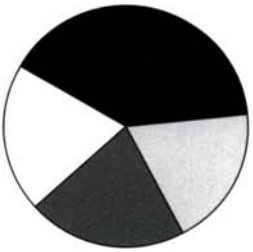


- Lion Foods
- British Pepper & Spices
- Bart Spices
- Other (incl. own brand)
- McCormick/Schwartz

FRANCE Market Shares

- Amora
- Fuchs
- Other (incl. own brand)
- Ducros

GERMANY Market Shares



- Fuchs
- Ubena
- Other (incl. own brand)
- Ostmann

Source: Industry Estimates

France

France is the second largest spice market in Europe with estimated sales of ECU 217.8 million. This represents 13% of the total EU market. France has over 15% of the EU import market, second only to Germany. Total imports are between 22,000 and 26,000 tonnes valued at ECU 47 to 49 million. In terms of value the most important spice is vanilla, reflecting the pivotal role that France plays in the European vanilla trading and processing industry. France imports around 35% of Europe's vanilla, almost exactly the same amount as Germany. Pepper is the most important spice imported in terms of volume and second in terms of value. Paprika and capsicums are the third largest import while saffron imports represent more than 18% of EU supplies, reflecting France's close connection with this industry.

France has one of the highest per capita consumption levels of herbs and spices in Europe. This is due to its high culinary standards, its old colonial ties and its former domestic production base. France is still one of Europe's largest producers of herbs and spices, mainly items like sage, fennel and tarragon, grown in the south of the country.

Of the total market for herbs and spices estimated at 837 million francs, 41% is pepper, 31% other spices, 24% herbs and 4% speciality products. The pepper and spice market has not been growing, although herbs have been growing at 8% and specialities at 19% a year.

Like other EU states the import of spices into France has been basically stagnant, any increase in volume being offset by a decline in unit value. The main sources of spices into France reflect the relative importance of products imported and its old colonial links. Madagascar is a major source of vanilla, cinnamon and pepper. The Comores and Tahiti supply vanilla. Paprika comes from Morocco and Spain.

The market for branded spices is dominated by Ducros (Erdania Beghin Say), which has more than 50% of the market as well as major share of the Spanish market. The only major competitor is Amora (Danone group), which has 17% of the market and also strong links in Belgium (Liebig Benelux). Both these companies are also involved in the sale of pickles, ketchup, vinegar and sauces.

Supermarket and discount house own labels are of increasing importance in France with around 20% of the market (see Table 8).

There has been a growing demand for exotic food in France. As a result, sales of speciality spice mixes for Mexican, Thai and Indian cooking have been growing rapidly, through specialist companies like Martignon, Laco and Thiercelin.

France has a long tradition of fragrance and flavours compounding based around Grasse and Paris. Many of these companies are actively involved in

spice processing and sometimes even cultivation. Vanilla, fennel, anis and pepper are all extracted for the perfumery and food industry by companies like Sanofi, Mane and Robertet while well established specialist trading houses such as Arco and VF Aromatique have strong links with French overseas territories and ex-colonies.

France is a significant exporter of spices and spice extracts. Exports are around 5,000 to 8,000 tonnes valued at 11 million francs. This is partly re-exports and partly locally produced material, especially crops grown in France's overseas territories. This includes vanilla and cloves from such places as Reunion and Mayotte, or mace and nutmeg from Guadelope and Martinique.

The main association is the Syndicate National des Transformateurs de Poivres, Épices, Aromates et Vanille (SNPE) which has 22 members. Association "La Route des Épices" is a small promotional organisation involved in spices. This is closely linked to COVIP which is responsible for the promotion of condiments, vinegars, peppers and spices.

Netherlands

The Netherlands is the third largest spice industry in Europe with a turnover estimated at ECU 192.7 million, or 11.5% of the market. The Netherlands, despite its small population, has 15% of the EU market. This reflects its importance as an entrep(t centre. Pepper, paprika and nutmeg dominate imports into the Netherlands. It is the major importer of nutmeg and mace in Europe (45-50% of the total) as well as the largest importer of caraway seed (48%). The Netherlands is also the largest producer of this spice in Europe.

The large immigrant community and the country's old colonial ties have stimulated local demand for products like ginger, cloves and cinnamon. More than 35% of the Netherlands' pepper imports, 60% of its nutmeg and 70% of its cinnamon come from Indonesia.

The Netherlands is a major re-exporter of spices both to other EU countries and to the USA. Exports have grown from 18,000 to more than 22,000 tonnes in the last three years. The most important exports are pepper, caraway (imported and home grown), mixed ground spices and spice flavourings. These are handled by large well established trading houses like Catz International, Man Produkten and Van Eeeghen International

The Netherlands is a major centre for spice processing. Three of the world's largest flavour and fragrance houses have their European manufacturing base there (Quest, International Flavors and Fragrances (IFF) and Tastemaker). All these firms produce oleoresins, essential oils and natural spice extracts using spices imported into the Netherlands. Apart from the

above, there are four or five companies specialising in the processing and packing of spices in the Netherlands. These include Euroma (owned by Burns and Philip), Conimex (owned by CPC), Van Sillevoldt (Silvo brand) and the Huybregts Groep.

The Nederlandse Vereniging Voor De Specerijhandel (Netherlands Spice Association) has 31 members including most of the leading traders and processors in the country. The association works closely with the Dutch Standards Institute (NNI) in the drawing up of appropriate national standards. There are 17 NEN norms applying to herbs and spices.

The Dutch spice decree outlines national legislation concerning spices. These include tolerances and cleanliness norms and regulations concerning herbicide and pesticide uses and permitted residual levels. It should be noted that ethylene oxide has been banned since 1991 for the use of cleaning spices destined for the Dutch market. On the other hand Dutch food laws do allow the sale of irradiated spices, this being one of the few European countries where irradiated product is frequently found.

UK

The UK is the fourth largest herb, spice and seasoning market in Europe ranked in terms of total sales, with a turnover estimated at ECU 160.8 million (9.6% of the EU market). The UK ranks just behind the Netherlands and Spain as the fifth largest importer of spices in Europe.

UK imports of spices are in the region of 32,000 tonnes valued at ECU 40.5 million. Like most of Europe, pepper is the largest single spice imported. Traditionally the UK imported mainly white pepper but a noticeable trend away from white pepper is occurring. During the last five years sales have declined by 13% against a 50% increase in overall sales of pepper and pepper products. Ginger is also an important import item. The UK imports 45% of EU supplies.

As the EU member with the largest Asian community, imports of spices for use in curry powder such as coriander (37% of EU imports), turmeric (44% of EU imports), cumin (37% of EU imports) and capsicums are larger than any other country in Europe. Mixed curry powder imports are more than 1,600 tonnes (66% of EU supplies). The UK's historical ties with the Commonwealth, its large Asian and Caribbean ethnic population and its importance in the entrep(t trade ensure its central role in the European spice industry.

The UK is also a major exporter of curry powder, prepared sauces and spicy foods. These account for more than 30% of the UK's ECU 11 to 12 million spice export business. Although the UK is a relatively sophisticated and well developed spice market, per capita consumption of herbs and spices is low by international standards. Domestic sales of spices are estimated at ECU 70 to 76 million.

Food retailing in the UK market is dominated by the supermarkets (see Table 9), which control nearly 70% of the market for foodstuffs. Most supermarket chains tend to offer only one or two branded spices plus their own label products. Schwartz is the dominant brand with over 50% of the market. Three other companies - Lion Foods, Bart Spices and British Pepper and Spices (Millstone brand) - together have 16% of the market. All the main producers supply own brand products for the supermarkets, which account for 31% of the market (the largest own brand market in Europe, see Table 8).

Foreign investment in the UK spice sector is very significant. McCormick of the USA which owns Schwartz, Glentham International (a supplier of industrial seasonings) and European Food Ingredients (a food processing intermediary) dominates the market. British Pepper and Spices, owned by Burns Philp of Australia, and Lion Foods, owned by Chinney Holdings of Hong Kong, are the other main players.

The UK is a major centre for the manufacture of curry powders, spicy sauces, pickles and pre-prepared Asian foods. Companies like Veeraswamy's (part of West Trust), Sharwoods (part of RHM), Trustin Foods and TRS (Suterwalla) manufacture and export worldwide. The UK is also a major producer of fragrances and flavours with leading multinationals such as Quest International, Bush Boake Allen and specialist firms like Lucas Ingredients and James Dalton (part of the Swiss flavours house Firmenich). These companies produce and distribute spice oleoresins, spice oils and a whole range of specialist blend spice extracts and value-added food ingredients. The Seasonings and Spice Association has around 23 members, including all the major spice packers and spice ingredient manufacturers.

As on the continent the market for traditional packaged spices is generally stagnant. Growth in the market is in the area of value-added products like curry sauces, spicy ready-made foods and specialist items like lemon and dill seasoning mix, spice and herb pastes, or exotics like cajun sauces.

Spain

Spain has become the fifth largest market for spices in Europe with a turnover estimated at ECU 153 million. Unlike other European countries Spain is a major producer of spices. These include paprika, saffron, aniseed and fennel. Because of a gradual decline in local production Spain has had to increase imports of spices. Spain has nearly a 13% share of the EU market. This is mainly paprika (33% of the EU market) and saffron (29% of the EU market), and to a lesser extent cinnamon (13% of EU imports). Because of its geographical position Spain has helped develop spice production in Morocco. This is its main source of paprika and a growing supplier of saffron.

There are close commercial links between France and Spain, with companies like Ducros, Amora and Theircelin having major interests in Spain. Local firms include Distribution Vilascar which supplies the Dani brand, and "La Barraca". There is a large spice and essential oil processing industry based around Murcia and Grenada. This includes companies like Pimursa and Ramon Bordas.

Spain is a major exporter of spices. The level of exports varies depending on the level of domestic production of saffron and paprika. Exports of paprika vary from 13,000 to 17,000 tonnes. The total value of Spanish exports is ECU 49 to 55 million. Exporters are represented by Afexpo, a trade organisation with over 20 members.

Table 9. Concentration in the European Food Retailing Sector

1990	Supermarkets <2500 m2	Hypermarkets >2500 m2	Retail Density*
Portugal	605	18	102
Greece	5362	18	184
Italy	3370	86	171
Belgium	1919	-	141
Spain	2500	102	134
Luxemburg	5	-	116
Denmark	944	49	100
France	7050	790	97
Ireland	n.a.	n.a.	90
Germany	8000	996	85
UK	1950	644	81
Netherlands	2050	40	80
			107

Source: Retailing in the European Single Market 1993.
* = Retail outlets per 10,000 people.

Portugal has the highest number of shops per head. The Netherlands has the greatest degree of concentration. Germany and France have the largest number of hypermarkets.

Table 10 Major Food Retailers

	Turnover (Billion ECU)	Country
Tengelmann	22.8	Germany
Metro (plus non-food)	22.6	Germany
Rewe	20.1	Germany
Carrefour	16.2	France
Intermarché	15.4	France
Le Clerc	15.3	France
Aldi	13.4	Germany
Edeka	13.2	Germany
Sainsbury	13.0	United Kingdom
Promodes	10.9	France
Tesco	10.8	United Kingdom
Spar	10.1	Germany
Casino-Rallye	10.0	France

Source: Retailing in the European Single Market 1993

Table 11 Main Outlets in Europe

	SUPERMARKETS	DISCOUNT HOUSES
Belgium	GB, Deihaize le Lion, Courtheoux, Frades-Match	Aldi, Colruyt
Denmark	Farør, Spar/Vivo, Mege	Fakta, Netto, Aldi
Germany	Tengelmann, Metro, Rewe, Edeka	Aldi, Phrs (Tengelmann), Netto
UK	Sainsburys, Tesco, Coop (CRS), M&S, Argyll, ASDA, Safeway, Gateway	Kwik-Save, Low Cost, Aldi
Spain	Pryca, Cecotinsa, Alcampo, Hipercor	Dirsa (Promodes) Jobac (Mercasa)
Greece	Prisunic, Hellaspar, S, Klaventis, Alfa-Beta	
France	Intermarché, Le Clerc, Carrefour, Promodes, Auchan, Cascno	Carrefour, Aldi, Novma
Italy	Standa, GS, Sidis, Coop Italia, Esselunga	Scucho,Meta, Familia
Ireland	Dunnes, Quinnsworth, Pennys (Primark)	
Netherlands	Edah (rendex), De Boer, Albert Heijin (Ahold), Hermans	Basis Market (vendex), Aldi
Luxumburg	Monopol, Coop des Chementos, Cactus, Match, Fisher	

Source: Retailing in the European Single Market 1993

The European Union

From January 1995, following the accession of Sweden, Finland and Austria, the European Community (EC) changed its name to the European Union (EU). The members of the EU are now: Austria, Belgium, Denmark, France, Finland, Germany, Greece, the Republic of Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, Sweden and the United Kingdom. The only West European countries not forming part of the Union are Switzerland and Norway, both of whom voted to stay outside.

The Free Market

1993 was the first year in which member states of the EC operated in a totally free trade area, allowing the unrestricted movement of goods, services, people and capital. With the accession of Spain and Portugal to the EC in 1986, the unification of Germany, and the accession of Sweden, Finland and Austria the EU now has a community of more than 350 million people - very nearly as many as the USA and Japan combined.

Harmonisation of trade legislation means in practice that no regulatory checks are imposed at the internal frontiers in the Community, and that all road haulage permits and quotas for trade between member states have been abolished. Many time-consuming delays at border crossings have been eliminated; however, trader-based controls do exist to protect the Community's high standards of hygiene and plant health.

Tariffs and Quotas

The application of tariffs and quotas to imports into the EU has now been harmonised across the member states. A commodity will attract the same tariff irrespective of the port of entry, and, once imported, goods are free to circulate within the EU without further duty.

A list of EU duties applying to spices and herbs is given in Table 12. Members of the African, Caribbean and Pacific (ACP) group of countries, the Least Developed Developing Country (LDDC) group and some other country groupings and individual countries benefit from preferential rates of duties for certian products. A full, detailed, and up-to-date tariff schedule should always be consulted. Other countries outside the EU not belonging to the Meditterean states or Eastern Europe are subject to GSP duty rates as negotiated under the new GATT agreement (see Annex 2).

To benefit from ACP duty preferences the exporter must ensure that each shipment is accompanied by documentary evidence that the goods comply with the rules of origin. To be classified as ACP Form EUR 1 must be supplied, while Form A is used to identify the produce as originating in an LDDC (Annex 3).

With the exception of spices which are grown in EU countries such as saffron and paprika, duties are small or non-existent. Duties on product used for extraction may be subject to a duty, as are some essential oils and oleoresins. This is largely to protect the EU spice processing industry.

Table 12 - Tariffs by product group, as a percentage of CIF value, without duties or VAT

			Preferential Tariffs		
Code	**Product**	**Full Tariff**	**GSP**	**ACP**	**LDDC**
	Pepper of the genus *Piper*				
0904.11.10	Dried pepper for industrial manufacture of essential oils or resinoids (excluding crushed or ground)	Free			
0904.11.90	Dried pepper (excluding crushed or ground and that for manufacture of oils or rersinoids)	Free			
0904.12.00	Pepper; crushed or ground	4%	Free	Free	Free
0904.20	Fruits of the genus *Capsicum* or the genus *Pimenta*, dried or crushed or ground				
0904.20.10	Dried sweet peppers (excluding crushed or ground)	11.6%	11.6%	Free	Free
0904.20.31	Dried fruit of genus capsicum for manufacture of capsicin or capsicum oleoresin dyes (excluding crushed or ground)	Free			
0904.20.35	Dried fruits of genues Capsicum or Pimenta, for industrial manufacture of essential oils or resinoids (excluding crushed or ground)	Free			
0904.20.39	Dried fruits of genus Capsicum or Pimenta (excluding 0904.20.35)	5%	5%	Free	Free
0904.20.90	Fruits of genus Capsicum or Pimenta, crushed or ground	5%	1.6%	Free	Free
0905.00.00	Vanilla	10.6%	10.6%	Free	Free*
0906.10.00	Cinnamon and cinnamon-tree flowers (excluding crushed or ground)	Free			
0906.20.00	Cinnamon and cinnamon-tree flowers, crushed or ground	Free			
0907.00.00	Cloves whole fruit, cloves and stems	10%	10%	Free	Free*
0908.10	Nutmeg				
0908.10.10	Nutmeg for industrial manufacture of essential oils or resinoids (excluding crushed or ground)	Free			
0908.10.90	Nutmeg other	5%	Free	Free	Free
0908.20.10	Mace (excluding crushed or ground)	Free			
0908.20.90	Mace, crushed or ground	4%	Free	Free	Free
0908.30.00	Cardamon	Free			
0909.10.10	Anise seed	Free			
0909.10.90	Badian seeds	10%	7%	Free	Free
0909.20.00	Coriander seeds	Free			
0909.30.11	Cumin seeds for industrial manufacture or essential oils or resinoids (excluding crushed or ground)	Free			
0909.30.19	Cumin seeds (excluding crushed or ground, or for industrial manufacture or essential oils or resinoids)	Free			
0909.30.90	Cumin seeds, crushed or ground	Free			
0909.40.11	Caraway seeds for industrial manufacture or essential oils or resinoids (excluding crushed or ground)	Free			
0909.40.19	Caraway seeds (excluding crushed or ground, or for industrial manufacture or essential oils or resinoids)	Free			
0909.40.90	Caraway seeds, crushed or ground	Free			

Code	Product	Full Tariff	Preferential Tariffs GSP	ACP	LDDC
0909.50.11	Seeds of fennel or juniper berries for industrial manufacture of essential oils or resinoids (excluding crushed or ground)	Free			
0909.50.19	Seeds of fennel or juniper berries (excluding crushed, ground or for industrial manufacture of essential oils or resinoids)	Free			
0909.50.90	Seeds of fennel or juniper, crushed or ground	Free			
0910.10.00	Ginger	Free			
0910.20.10	Saffron (excluding crushed or ground)	10%	10%	Free	Free
0910.20.90	Saffron, crushed or ground	10%	10%	Free	Free
0910.30.00	Turmeric (curcuma)	Free			
0910.40.11	Wild Thyme (excluding crushed or ground)	Free			
0910.40.13	Thyme (excluding crushed or ground, and wild thyme)	7%	7%	Free	Free
0910.40.19	Thyme crushed or ground	8.5%	8.5%	Free	Free
0910.40.90	Bay leaves	7%	7%	Free	Free
0910.50.00	Curry	Free			
0910.91.10	Mixture of 2 or more products	12.5%	Free	Free	Free
0910.91.90	Crushed or ground spice mixtures of 2 or more different headings	12.5%	3%	Free	Free
0910.99.10	Fenugreek seed	Free			
0910.99.91	Other spices	12.5%	Free	Free	Free
0910.99.99	Other spices NES	12.5%	3%	Fre	Free
3301.29	Essential Oils of Spices				
3301.29.61	Not deterpenated	Free			
3301.29.91	Deterpenated	2.3%	Free	2.3%	2.3%
3301.90.39	Oleoresins of Spices	Free			

* Excluding Peru, Ecuador, Colombia and Bolivia.

Export Procedures

Trade in spices is always done on the basis of samples. Most importers have standard contract forms which specify the agreed quality, price, shipment conditions, arbitration and payment terms. Arbitration procedures may be initiated if shipments fail to meet the standards of the sample. Because of the recent introduction of due diligence legislation, buyers, specifications may also include quality assurance details on such matters as purity of water used for washing produce, pesticide residues etc. Most traders prefer CIF or C&F port of destination quotations in the major trading currencies. New exporters are usually paid only on receipt and acceptance of goods. This usually involves laboratory testing of batch samples. Established suppliers tend to be paid cash against documents.

The International General Produce Association (IGPA) is an important organisation for the promotion and regulation of trade in spices and produce such as medicinal plants, essential oils and other natural product extracts. Based in London, its membership consists of importers, brokers, agents and exporters involved in trading these commodities. IGPA contracts are rapidly becoming the industry norm. There are three basic types of contract: No 1, No 3 and Spot. No 1 includes general produce on CIF and

C&F terms, No 3 general produce on FOB terms, and Spot for general produce for goods in store or forward delivery. Special contracts exist for pepper (No 5) and essential oils and aromatic chemicals (No 9).

The IGPA is working closely with another important organisation involved in the promotion and organisation of the spice industry, the European Spice Association (ESA). The ESA, established in 1984, comprises 12 national associations drawn from the EU and elsewhere in Europe. The ESA's main aim is to represent, promote and protect the interests of its members, especially concerning relations with the European legislative institutions. Much of the legislation affecting the European spice industry emanates from the European Commission. ESA provides an effective channel of two-way communication between the Commission and the European industry.

The ESA has links with all the EU national associations. Where no spice association exists, as in Greece, the ESA encourages the industry to form one. The ESA is presently involved in the following important tasks:

- Development of " Specifications of Quality Minima", minimum standards which can be attached to contracts such as those of the IGPA.
- Development of new recommendations on aflatoxin for submission for consideration by the European Commission.
- EU-wide collection and review of tests on pesticide residues with a view to formulating new recommendations on maximum residue levels (MRLs).

European legislation with regard to quality control gives priority to the health and safety of the consumer. This is partly due to the various health scares of recent years. These led to a growing insecurity on the part of the consumer and increased sceptism as to the safety of processed food products in general. The European spice industry has been affected by cases of, for example, aflatoxins found in nutmeg and chillies, heavy metals in paprika, high bacterial content in pepper and salmonellae in paprika. Some producers were forced to withdraw large consignments of their products from the retail trade or the food processing industry. The companies were mentioned by name in the national media, causing losses running into millions of ECU as well as a series of law suits.

Every product produced in one member state has the legal right to be sold in another member country of the EU. It follows that no individual member country can develop food legislation without regard for legislation in other member states - especially with regard to limiting undesirable substances in food. Work is in progress to standardise legislation within the EU for the following areas:

- aflatoxin limits
- specifications on microbiology, especially salmonellae
- general hygienic standards for food products

Aflatoxin Regulations

The present aflatoxin regulations differ substantially between member states. Official German authorities have recently reported that many samples taken of pepper, paprika and chillies have greatly exceeded the existing German aflatoxin limit of 4ppb/kg. The ESA has now compiled a data base on aflotoxin. Of 13,000 available reports more than 50% were above the limits of the German law. This has resulted in much closer attention being paid to this subject than hitherto.

The European Commission presented a Draft Directive on Aflatoxin in December 1994. It suggested a European-wide limit of 4ppb/kg total aflatoxin content for spices. This limit is likely to become law shortly. Producers in Europe and the growers in the countries of origin will have to comply with this regulation. ESA revised recommendations are included in the section on standards and specifications.

Testing for aflatoxin is an extremely difficult task due to testing problems. To obtain 100% guarantees that the product is free from this substance would require an enormous amount of sampling, which is clearly impractical and uneconomic. Assessment as to whether batches of product will have to be withdrawn when a single positive aflatoxin result has been found in tests needs to take into consideration the type and number of tests that had been previously undertaken on the consignment. It will also need

to ensure that the recommended sampling and testing procedures had been carried out by the supplier.

The German Spice Association has drafted proposals which aim to tighten up sampling procedures while still ensuring that companies that have undertaken adequate due dilgence tests will be able to undertake further sampling and testing and where necessary replace product without fear of prosecution by the health authorities. It is clear that product-specific measures will be required and that exporters will be expected to bear the burden of more and more of these testing activities. Exporters unsure of what procedures need to be followed should obtain information from their agent or importer or contact directly the trade association in the respective member country.

Microbiology

Europe has no legislation for the maximum limits of microbiological contamination in spices. There are, however, guidelines which are referred to by the official national food inspectorates. New ESA recommendations are being finalised (Table 14).

Microorganisms are found everywhere. Since pathogens like salmonella are not naturally occurring on spices, they must develop through poor handling or accidental contamination. Animals, birds and man are the primary sources of pathogens which can contaminate spices through contact with faecal matter. Insects such as flies and cockroaches and rodents like mice, rats and squirrels are also a source of contamination. During the cultivation process microbial control can be carried out as follows:

- Prevent contamination of irrigation water with sewage and animal waste
- Prevent spices from lying on the ground at harvesting
- Prevent animals from entering drying, storage and grading areas
- Dry spices quickly and effeciently to prevent microbial growth
- Avoid drying spices on the soil
- Avoid using contaminated water for washing of spices
- Avoid mixing clean lots with contaminated lots

Moulds and Yeast

Both moulds and yeasts have the capacity for growing over a wide range of temperature and pH conditions. They develop in environments far less moist than required for bacteria. Aspergillus flavus is a potentially dangerous mould which produces a potent mycotoxin known as aflatoxin. Aflatoxins have been found in a wide range of crops, particularly root crops

like ginger and turmeric. Because mycotoxins diffuse through foods and are not completely removed when surface moulds are eliminated, a food may continue to contain toxin even though it appears to be of satisfactory quality after having been cleaned. Protective mechanisms include the following.

- Keep material dry at all times
- Keep spices in covered containers or clean sacks
- Ensure proper air circulation during storage and transport
- Do not place bags directly on the ground
- Maintain storage and transport facilities free of animals and rodents

General Hygiene Standards for Food

Each member country has food safety legislation. These are similar but not identical in all member states. Some countries have more stringent laws than others but all comply to a basic minimum requirement.These standards have been issued in the interest of the consumer's health protection. It is important to know that according to this regulation the food processors determine the critical points for food safety in the course of the process themselves, and that they are obliged to carry out the supervision and the relevant documentation of it. The concept of these safety control measures is summarised in the Hazard Analysis Critical Control Points (HACCP), and includes the following steps:

- Analysis of potential risks in foodstuffs. For the spice industry this includes among other the supply of spices as raw materials.
- Identification of those stages in the process in which risks may occur. For the spice industry such stages can occur when processing the spices or when mixing them with other food.
- Determination and execution of effective control and supervision proce dures for these critical points.
- Special execution regulations are part of these general standards which are of great importance for the spice industry as well.

It follows from the above that the legislative bodies in Europe require impeccable quality standards and are determined to endorse these standards by law. Every producer of food products must acquaint himself with the prevailing legislation at the due time. The same applies to the growers, exporters and spice producers in the countries of origin. Those exporters that strictly comply with these standards, however, will be offered a good chance for increased market share.

For the UK the Imported Food Regulations 1984 provide general rules which are applied to imports from outside the EC. The regulations prohibit the importation of such food that is unfit for human consumption or is unsound or unwholesome. The authorities may examine, detain, sample and test any consignment where they believe such action is appropriate. Once imported into the UK, produce is subject to the requirements of the Food Safety Act 1990. This covers a range of issues including labelling, additives, preservatives, and composition of food. UK legislation is now among the most stringent in Europe. Products that meet UK standards will hence meet the legislative standards of almost all the other EU member states.

Codex Alimentarius Commission

The Codex Alimentarius Commission set up jointly by the FAO/WHO prepared in October 1994 a draft code of Hygiene Practice for Spices and Dried Aromatic Plants. This is used as the basis of much of the subsequent legislation and recommendations in this field. (Codex Alimentarius Commission 1995, Report on the 27th Session of the Codex Committee on Food Hygiene, Washington DC). This report covers hygiene interventions during cultivation and post-harvest handling, recommendations on the design and establishment of drying and processing facilities, e.g washing and changing facilities, effluent and waste disposal, cleaning and disinfection of product, medical examination and personal cleanliness.

Quality Assurance Programmes

According to due diligence legislation and consumer expectations, most European spice companies have implemented an internationally recognised quality assurance programme. In the spice industry, this particularly refers to purchasing spices as raw material. The concept of quality policy in enterprises comprises the following steps:

- Risk analysing during production and marketing (HACCP concept)
- Implementation of quality safety system according to ISO 9000/ISO 9002 requirements
- Internal quality requirements for spices in the company, so-called speci fications

Cleanliness Specifications for Whole Spices

The American Spice Trade Association (ASTA) has a schedule of minimum cleanliness specifications for whole spices and spice seeds that is widely accepted as a minimum trading standard throughout the trade. The limits of the various contaminants permitted under these specifications is summarised in Table 13.

Table 13. Cleanliness Specifications of ASTA

Cleanliness Specifications	Whole Insects, Dead	Excreta, Mammalian	Excreta, Other	Mould	Insect Defiled/ Infested	Extraneous/ Foreign Matter
Name of Spice Seed or Herb	By Count	By Mg/Lb	By Mg/Lb	% By Wgt.	% By Wgt.	% By Wgt.
Allspice	2	5	5.0	2.00	1.00	0.50
Anise	4	3	5.0	1.00	1.00	1.00
Caraway	4	3	10.0	1.00	1.00	0.50
Cardamom	4	3	1.0	1.00	1.00	0.50
Cassia	2	1	1.0	5.00	2.50	0.50
Cinnamon	2	1	2.0	1.0	1.00	0.50
Celery seed	4	3	3.0	1.00	1.00	0.50
Chillies/ capsicums	4	1	8.0	3.00	2.50	0.50
Cloves	4	5	8.0	1.00	1.00	1.00*
Coriander	4	3	10.0	1.00	1.00	0.50
Cumin seed**	4	3	5.0	1.00	1.00	0.50
Dill seed	4	3	2.0	1.00	1.00	0.50
Fennel seed	(2)	(2)	(2)	1.00	1.00	0.50
Ginger	4	3	3	(3)	(3)	1.00
Mace	4	3	3	2.00	1.00	0.50
Nutmeg (Broken)	4	5	5	(4)	(4)	0.50
Nutmeg (White)	4	0	0	(5)	(5)	0.00
Black Pepper	2	1	1	(6)	(6)	1.00
White Pepper	2	1	1	(7)	(7)	0.50
Turmeric	3	5	5	3.00	2.50	0.50

*** Clove stems** - A 5% allowance by weight for unattached clove stems over and above the tolerance of Other Extraneous Matter is permitted. **** Cumin Seed** - 9.5% total ash, 1.5% acid insoluble ash., ***** Oregano** - Sumac negative

(2) **Fennel Seed**: In the case of fennel seed, if more than 20% of the sub samples contains any rodent, other excreta or whole insects, or an aver age of 3 mg/lb of mammalian excreta, the lot must be reconditioned.

(3) **Ginger:** More than 3% mouldy pieces and/or insect infested pieces by weight.

(4) **Broken Nutmeg:** More than 5% mould/insect defiled combined by weight.

(5) **Whole Nutmeg:** More than 10% insect infested and/or mouldy pieces, with a maximum of 5% insect defiled pieces by weight.

(6) 1% mouldy and/or infested pieces by weight

(7) 1% mouldy and/or infested pieces by weight

Note: Some additional specifications concerning reconditioning are included in ASTA Specifications

Minimum Quality Specifications

A range of national and international standards organisations have established minimum quality standards for individual spices and herbs.

These standards are being continually revised. A summary of the key minimum chemical standards, prepared by the European Spice Association, is shown in Table 14.

Table 14 ESA Specifications for Quality Minima for Herbs and Spices

Product (whole form)	Ash % W/W MAX	Acid-insoluble Ash % W/W MAX	H2O % W/W MAX	Volatile Oil 5 V/W MIN
ANISEED	9 (ISO)	2.5 (AFNOR)	12 (ISO)	1 (ISO)
DUTCH CARAWAY (IOS)	8	1.5	13	2.5
CARDAMOM	9	2.5	12	4
CELERY SEED (ISO)	12	2.5	12	4
CHILLIE (ISO)	10	1.6	11	-
CINNAMON & CASSIA (ESA)	7	2	15 (under review as at 1.7.95)	0.4
CLOVES	7 (ISO)	0.5 (ISO)	12 (ISO)	14 (AFNOR)
CORIANDER	7 (ISO)	1.5 (ISO)	12 (ISO)	0.3 (ESA)
CUMIN (ISA)	14	3	13	1.5
DILL SEED (ESA)	10	2.5	12	1
FENNEL SEED (ISO)	9	2	12	1.5
GARLIC POWDER	6 (ESA)	0.5 (ISO)	7 (ESA)	- (ISO)
GINGER	8 (ISO)	2 (SA)	12 (ISO)	1.5 (ISO)
MACE (ISO)	4	0.5	10	5
NUTMEG	3 (ISO)	0.5 (ISO)	12 (ESA)	6.5 (ESA)
PAPRIKA POWDER (ESA)	10	2	11	-
PEPPER BLACK	7 (ISO)	1.5 (ESA)	13 (ESA)	2 (ISO)
PEPPER WHITE	3.5 (ISO)	0.3 (ISO)	13 (ISA)	1.5 (ESA)
PIMENTO				
Jamaica	5 (ESA)	0.4 (ISO)	12 (ISO)	3.5 (ISO)
Other origins	5 (ESA)	1 (ESA)	12 (ISO)	2 (ESA)
SAFFRON WHOLE (ISO)	8	1	12	-
SAFFRON GROUND (ISO)	8	1.5	10	-
THYME	14 (ISO)	4 (ESA)	12 (ISO)	1 (ISO)
TURMERIC				
WHOLE (ISO)	8	2	12	2.5
GROUND	9 (ISO)	2.5 (ESA)	10 (ISO)	1.5 (ESA)

Source: European Spice Association 1995.
Note: Abbreviation in brackets refer to National Standards Organisations. Acid Insoluble Ash gives an indication of the extraneous matter content.

Pesticide Residues

The EEC Directive 90/642 in force since November 1970 has been extended several times, as a result of new toxicological evaluations of pesticides which have to be incorporated into legislation. Although regulation 90/642/EC on Maximum Residue Level (MRL's) has been adopted by the Member States, the list of MRL's is not yet complete.

Spices are clearly incorporated into the scope of this Directive. As a result the national Spice Associations and the European Spice Association will have to come forward with suggestions concerning the maximum pesticide limits in spices. This is a difficult task as there is insufficient information on applied pesticides in the countries of origin. Collaboration with overseas growers will be required. If the industry cannot suggest any limits for a particular product then any spice containing a residue of that particular pesticide residue will be excluded from sale.

The German Government is very actively involved in the subject matter of pesticides. It's suggestions imply particularly drastic restriction of these limits. The chart below shows such a list of pesticides in spices and the proposed reduction of limits for some chemicals (see Table 15).

In the UK The Pesticides (Maximum Residue Levels in Food) Regulations 1988 specify the maximum levels of pesticides which may be left in a range of foods. Maximum residue levels (MRLs) are set for over 1000 pesticide/commodity combinations. Produce containing residues in excess of an MRL can be seized or destroyed. If the pesticide manufacturers' instructions are followed, maximum residue levels are not likely to be exceeded.

A Compendium of Pesticide Regulation in the European Community (Oct 1989) has been compiled by EUCOFEL

Herbicide Recommendations

There are few formal specific recommendations for the use of herbicides on spices, herbs and aromatic plants. Importers are increasingly concerned with residue levels in the final product and where possible growers should minimise the use of herbicides and ensure they use products with a minimum residual potential. Some herbicides like Bromoxynil, Thiourea (ANTU) and Nitrofen are banned in certain EU member states. Most of the recommendations and restrictions are covered under the heading of pesticides.

Cleaning and Reconditioning

Whether spices are processed at origin or in Europe the following minimum steps must be taken

- Grading

- Cleaning by means of a) sieves b) air seperators
- Additional cleaning using a) stone seperators b) magnets c) metal detectors
- Germ reduction (usually by means of steam)
- Packing in bulk bags for shipment to retail packers

Table 15 - Pesticide Residues in Spices: Sample Reports and Recommendations

	Samples taken			Recommendations		
PRODUCT	Lowest found value (ppm)	Highest found value (ppm)	Average values (ppm)	Former Highest Recommended value (ppm)	New Highest Recommended values (ppm)	Lower Recommended value (ppm)
Lindan	0.001	0.99	0.013-0.17	2.00	0.01	0.005
Chlorpyrifos	<0.05	3.55	0.1-1.795	2.00	0.05	0.05
Quintozen	0.003	1.79	0.006-0.17	1.00	0.01	0.005
Gessarntendosulfa	0.013	1.2	0.24-0.27	30.0	0.10	0.02
Pirlmiphos-methyl	0.003	2.51	0.12-0.269	5.00	0.05	0.05
Phosalon	0.05	0.40	0.05	2.00	0.05	0.10
Dicofol	<0.04	1.71	0.21	0.05	0.05	0.05
Tetradifon	0.01	0.18	0.01-0.18	0.01	0.05	0.01
Malathion	0.005	5.30	0.057-2.68	8.00	0.05	0.05
Brompropylat				5.00	0.05	0.05
Chlorbenzilat				2.00	0.05	0.20
Dimathoat	0.022	0.46	-	1.00	0.05	0.05
Gmethoat	0.07			0.40	0.40	0.05
HCH ohne Lindan	0.002	8.40	0.037-0.67	0.20	0.20	0.01
HCB (Hexachlorbenzol)	0.002	19.90	0.011-1.47	0.10	0.10	0.006
DDT	0.001	6.27	0.04-0.438	1.00	1.00	0.03
Aldrin & Dieldrin	0.002	12.00	0.004-2.64	0.10	0.10	0.006
Azinphos-methyl				1.00	0.05	0.10
Bromophos	0.005	0.05		2.00	0.10	0.05
Bromophos-ethyl	0.33		0.33	2.00	0.05	0.05
Chlordan	0.041			0.05	0.05	0.005
Chlorfenvlnphos	0.27			1.00	0.05	0.05
Chlorpyrifos-methyl		0.21		5.00	0.05	0.05
Chlorthalonil				0.20	0.01	0.02
Diazinon	0.005	0.06	0.026	0.50	0.05	0.05
Dicloran	0.03			0.10	0.10	0.006
Dichlorvos	0.05	1.75	0.05	2.00	0.10	0.05
Dioxthlon				3.00	0.05	0.05
Disulfoton				10.00	0.01	0.05
Ethion	0.1	0.70		2.00	0.05	0.05
Fenltrothion	0.00		0.115	2.00	0.05	0.05
Fensulfothion				0.10	0.02	0.05
Formothion				0.20	0.01	0.05
Haptachlor und-expoxid	0.001	28.70	0.001-5.629	0.10	0.10	0.005

Source* Fachverband der Gewurzenwahre: Bonn

All these operations should be undertaken in an environment that meets the health and safety legislation of the importing country. The different types of equipment required to undertake most of the above activities for the removal of particular contaminant types in particular spices, based on ASTA recommendations, are listed as Table 16.

Table 16. Recommended Cleaning Equipment

	Whole insects dead	Excreta rodent	Excreta other	Insect defiled	Extraneous matter
NAME OF SPICE, SEED OR HERB	**RECOMMENDED MACHINE BY REFEENCE NUMBER**				
ALLSPICE	8	8	8	2 + 9	8
ANISE SEED	4	4	4		4
CARAWAY	4	4	4		4 + 3
CARDAMOM	9	9	9	2 + 9	9 + 3
CASSIA/CINNAMON	9	9	9	2 + 9	9 + 3
CELERY SEED	4	4 + 3	4 + 3		4 + 3
CHILLIES	9	9	9	2 + 9	9 + 3
CLOVES	9	9	9	2 + 9	9 + 3
CORIANDER	8	8	8	2 + 9	8
CUMIN SEED	4	4	4		4 + 3
FENNEL SEED	4	4a	4		4 + 3
GINGER (WHOLE & SPLIT)	9	9	9	2 + 9	2 + 9 + 3
NUTMEG (WHOLE)	7	7	7	2 + 9	9
BLACK PEPPER	8	8	8		8
WHITE PEPPER	8	8	8		8
TURMERIC	7	7	9	2 + 9	2 + 9 + 3

Number	Machines	Number	Machines
1.	Aspirator (Air Separator)	6.	Sifter aspirator
2.	Rotary Knife Cutter	7.	Plain Sifter
3.	Destoner	8.	Spiral Gravity Separator
4.	Vacuum Gravity Separator (Air Table)	9.	Air Screen Separator
5.	Cylinder Separator (Indent)	10.	Magnets

Source: ASTA.

Note: This chart matches the spices and typical contaminants to the machine best suited for separation.

Sterilisation of Spices

Safe and efficacious methods of sterlising spices are among the most controversial issues facing the European spice industry. Under the prevailing production and handling conditions, most spices and herbs contain a large number of micro organisms capable of causing spoilage or, more rarely, disease. The source of contamination may be dust, insects, faecal materials and possibly water used in the soaking and pre-processing operations. Fungal growth may appear prior to drying or during storage and shipping. Adulteration with other foodstuffs or minerals uually takes place at the grinding or repacking stage. As detection methods become more and more sophisticated the number of reports of bacteriological and chemical contamination increases.

Although spices are not an ideal substrate for the growth and survival of Salmonella, this has been found from time to time as well as fungal contaminants like Aspergillus and Penicillium.

Chemical Fumigation

Because of the volatility and heat sensitivity of the delicate flavour and aroma components of spices and herbs, normal heat sterilisation cannot be used without damaging product quality. The most widely used method of decontamination of dry ingredients is fumigation. Until recently, ethylene oxide was widely used. Because of the health hazards attached to its use an EC Directive prohibits the use of ethylene oxide within the EC after 1990 without derogation. An alternative widely used in the USA is methyl bromide. This has been shown to be highly effective on fruits, vegetables and flowers but claims that it is damaging to the ozone layer have led to its use being phased out under the terms of the Montreal Protocols. Products imported from outside the EU which have been fumigated with either of these products will no longer be acceptable. Exporters must consult with importers over acceptable fumigants to use prior to shipment.

Irradiation

Irradiation was widely considered the ideal solution to the problem of contamination, being a cheap and reliable way of sterilisation without causing any damage to quality of the spice. An International Consultative Group on Food Irradiation under the auspices of the International Atomic Energy Agency has undertaken a detailed review of the subject and in 1992 produced a report which basically came out in favour of its application under close supervision. A World Health Organisation study in 1994 also came out in support of the technique and recommended it should be more widely adopted as a way of reducing food-borne diseases. A large number of countries have legalised the use of irradiation technology (see Table 17) but, particularly in Europe, there has been strong consumer opposition to its use in foodstuffs. As a result almost all major suppliers of branded

spices and herbs refuse to use irradiated raw materials even though it may be legally allowed.

EU member states have been unable to agree on common legislation on the issue. The Netherlands has legalised its use and irradiates spices, herbs and vegetables using this method. The proposed "Directive on Food Products and Ingredients Treated with Ionising Rays" lays down methods of controlling irradiation plants and the use of techniques for foods both from within and outside the EU. Although this has not been signed, the EC has compromised by passing in 1991 an amendment to the Food Labelling (Amendment) (Irradiated Food) Regulations of 1990. Henceforth all foods that have been irradiated must carry on the label the words "irradiated" or "treated with ionising radiation". Exporters should check with their prospective EU partners before shipping product that has been irradiated.

Table 17. List of clearance on radiation decontamination of spices, condiments, herbs and dried vegetable seasonings

(As of 31 December 1991, grouped according to country)

Country	Product	Dose (kGy)
Belgium	black/white pepper	up to 10
	Paprika powder	up to 10
	different spices (78 products)	up to 10
Denmark	spices and herbs	up to 15 (max)
		up to 10 (aver.)
Finland	dry and dehydrated spices and herbs	up to 10 (aver.)
France	spices and aromatic substances (72 products inclusive powdered onion and garlic)	up to 11
	aromatic herbs (frozen)	up to 10
Hungary	spices	6 (aver.)
Netherlands	spices and herbs	up to 10
Norway	dried spices	up to 10
Poland	spices and herbs	up to 10
UK	spices and condiments	up to 10 (overall aver.)

Steam Sterilisation

The alternative sterilisation method used by almost all the major spice packers in Europe is that of steam sterilisation. No chemicals are involved and while costs are certainly higher than for irradiation or chemical fumigation it is far more acceptable to the customer.

The main problem with steam sterlisation is to avoid damaging the product through overheating and to prevent the colour and flavour principles being volatised. Recapturing these volatile substances during the recondensation phase is essential to preserve flavour. Various patented equipment has been developed such as McCormicks' Micromaster or Fuchs' Micro Control which provide sufficient heat to kill most germs without losing the volatile oils. This type of equipment has been found to neutralise coliforms, listeria, most Salmonella, mould and yeasts. It also helps reduce the incidence of heat resistant spore forming bacteria like Bacillius or Clostridium.

Another method of sterilisation applicable to industry is microencapsulation. Here the spice is very rapdily heated. Any volatiles driven off in the process are trapped within the capsule coating, ensuring no loss of flavour. Finally, a technology which is gradually gaining acceptance is carbon dioxide. CO^2 is already being used as a clean and effecient solvent for spice extraction purposes. Its use as a fumigant has been limited due to cost.

Solvent Residues in Processing

Another area of increasing concern to consumers in Europe is the use of chemical solvents in food processing and the level of residues left on the product after solvent recovery has been completed. Various solvents have been removed as unsafe while others can be used only in limited circumstances. The growing interest in carbon dioxide extraction techniques, a clean and completely safe solvent yet expensive technique, is partly a reaction to these apprehensions.

Recommendations concerning the determination and use of solvents in the extraction and processing of spices and herbs are largely in the hands of trade associations and research bodies. The International Organisation for the Flavours Industry (IOFI), the European Spice Association (ESA) and the American Spice Trade Association (ASTA) all make non-mandatory recommendations in this area. The latest IOFI recommendations are as follows:

	Maximum level (ppm in product)
Butane	1
Propane	1
Isobutane	1
Toluene	1
Cyclohexane	1
Hexane	1
Light Petroleum	1
Methanol	10
Butan -1-ol	10
Acetone	2
Ethylmethylketone	2
Ethyl acetate	10
Diethyl ether	2
Dibutyl ether	2
Dichloromethane	2
Carbon Dioxide	no limit

Note: Carrier solvents, other flavouring substances and some natural food materials can be used as extraction solvents; their limits are not specified.

Limits on Usage of Spices and Spice Extracts in Foodstuffs

The Council of Europe in 1981 prepared a detailed report giving a list of natural sources of flavourings according to their acceptability for use in food. It also draws attention to certain sources of natural substances which present a hazard to public health. This report and its subsequent amendments include all the major spices, spice extracts and other natural flavourings used in the European spice industry.

CHILLIES (PUNGENT CAPSICUMS)

Chillies are the pungent (hot) fruits of selected types of annual and short term perennial Capsicums from three main different species *(C. anuum, C. fructescens, and C. chinense*). Whole chillies are the juiceless and dried pods of plants of the Capsicum genus. Dimensions vary from 20 mm to 120 mm long and 4 mm to 50 mm wide. Colour varies widely according to variety as well as duration and quality of storage. All chillies contain a pungent principle made up of capsaicinoids.

Dry chillies (or pungent capsicums) are widely used throughout the world to add pungency to food. Chillie oleoresin is used in the food processing and pharmaceutical industry. Fresh chillies are also an important export item but they are considered a vegetable not a spice.

Form

There are a wide range of products based on whole or ground chillie entering world trade. The terminology for these products can be confusing, and definitions can vary between and even within markets. Chillies are used in whole dried or chopped form or as a ground powder. Chillie paste and chillie sauce are also frequently sold. An oleoresin is produced.

The key parameters for any dried chillie product are pungency level (measured in % capsaicin or Scoville Units) and colour (measured in ASTA colour units). In addition, size and appearance may be important. Producers should be sure that they understand exactly what the market requires.

Production and Processing

Great care should be taken over variety selection for yield, pungency content and colour values, as well as annual/perennial types. Perennial varieties (which include the highly pungent Birdseye types) are generally only cropped for three years at most. With increasing age, yields and pungency levels fall. These chillies are

continually harvested as they ripen. With annual types, fruit can be left to partially wither on the plant before the whole crop is harvested. Well known varieties include Chinese Fukien Rice, Li Ling, Mexican Ancho and Tabasco, and East African Malawi, Ugandan and Mombasa chillies.

Annual types require a mimum of 600 to 900 mm rainfall during the growing season; perennial types benefit from higher levels. The crop is not tolerant to frosts, and does not grow well where average temperatures are below 12 to 15^{o}C. Temperatures above 32^{o}C cause flower drop and can reduce yields substantially. Soils should be well drained. The crop can be direct seeded in the field, or sown in nurseries and transplanted. Seed rates vary widely depending on final plant size (a variety characteristic). For direct seeding, seed rates are in the range of 5 to 10 kg/ha; for nursery operations, 1 kg of seed should give sufficient plants for 1 ha. The crop suffers from a wide range of potentially serious pest and disease problems.

After harvest the fruits are dried to below 10% moisture content. It is important not to break the fruit or the seeds will be lost. Simple sun drying is commonly used, but this reduces colour content and pungency. Artificial drying systems (using indirect fired driers) give a higher quality product. Oleoresin is produced by solvent extraction of the ground chillie powder.

Exporters

The main exporters are Southern Africa (South Africa, Malawi and Zimbabwe), India, and China. Mexico and Pakistan are also major producers but are not major suppliers to Europe. These are mostly low or medium pungency varietes like Indian S4 Chillies, Tiensin Chinese Chillies or Pakistan Dandicut Chillies. Malawi, Zimbabwe and Uganda export limited quantities of the highly pungent "East African Birdseye chillies". PNG also exports a highly pungent Birdseye type, and China exports some high pungency types (Fukien). It should be remembered that Europe represents a very small export market for chillies relative to the USA or Far East markets like Sri Lanka, Malaysia, Korea and Japan.

Imports

Custom codes:090420/0904210/09042031/09042035/09042039/09042090

Imports of chillies can only be estimated as import statistics combine them with paprika and pimento. All data for the major import classifications of Capsicums are given in the section on Paprika. Total imports of chillie powder are estimated at 3,700 to 4,200 tonnes and those of whole chillies around 1,800 to 2,000 tonnes (of which 300 to 400 tonnes are high pungency types). Imports as whole chillies have fallen as exports of chillie powder have grown. There are a number of factories in India, Pakistan and China set up in collaboration with multinational spice companies which are now able to produce chillie powder to meet EC hygiene standards. The UK is by far the most important importer of chillies, reflecting its colonial heritage and

large ethnic community, with the Netherlands the second largest importer.

Re-exports

The UK is the main European importer and re-exports to other EU members around 200 tonnes of chillie powder, chillie paste and other chillie-based spice preparations.

Prices

Prices of both whole chillies and chillie powder vary greatly depending on cleanliness, pungency, colour and appearance of the product. Generally 0.7% capsaicin is the minimum level for the extraction market. Product with more than 1.0% fetches a premium. Prices for high pungency chillies (ie East African Birdseyes) are typically in the range US$ 2,000 to US$ 2,500/tonne. Low to medium pungency Indian chillies (0.3 to 0.5% capsaicin) fetch between US$ 1,200 and US$ 1,400 per tonne.

Demand and Opportunities

Demand has been influenced by the size of the Caribbean and Asian communities and the growth in popularity of Asian food in European cities. The major European markets (UK, Netherlands, France) are considered largely saturated and consumption is not expected to grow substantially. Greater growth potential is expected from Germany and Southern Europe. Demand is growing for value added products using chillies such as chillie paste, curry powders and other 'sauces' for the convenience food industry. Some of these are produced at origin but stringent hygiene and quality control levels must be maintained. In the extraction industry, there is always demand for high capsaicin content (over 1%) chillies, as this offers extractors a direct saving on unit costs of extraction.

The best opportunities for new suppliers lie in production of selected varieties of high capcaisin chillies for the extraction market, and in supplying niche retail markets for selected high colour high pungency whole chillies.

CORIANDER

Coriander *(Coriandrum sativum)* is an annual herb native of South-east Europe. It is widely grown in North Africa, the Middle East and South Asia. The spice is a vital component in curry powders and the fresh herb is widely used as a flavouring in kebabs and other Middle Eastern dishes. Ground coriander and coriander oil or oleoresin extracts are used in beverages such as gin, vermouth and liqueurs as well as in a wide range of sauces, seasonings and meat products. The oil is also sometimes used as a source of the aroma chemical linalol.

Forms

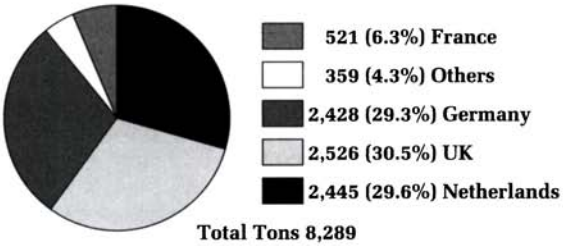
The dried fruits (a small capsule containing two seeds) are the coriander spice of commerce. The dried spice is usually only ground just prior to use to maintain oil content. Coriander oil and oleoresin extracts are also obtained from the spice. The dried ground spice is usually made from the large seeded type, whilst extractors prefer the small seeded type. Coriander leaf is used as a herb in both fresh and dried form.

Production and Processing

Coriander is a short season annual herb, with a 3 to 4 month growing season. The crop is tolerant of dry conditions and can be grown on heavy soils using residual moisture. There are two main variety types, and selection depends partly on required end use, and partly on growing conditions. The small seeded types have high oil and extract contents and are best suited to colder climates where early crop growth is slow. The large seeded type is used for grinding and is best suited to warmer growing conditions. The crop is seed sown, with seed rates in the range 15 to 25 kg/ha. It is important that fruits are fully ripe before harvesting, or oil quality (and spice taste) will be adversely affected. Fruit ripen progressively on the plant. There can be high losses around harvest as fully ripe fruit frequently shatter and fall to the ground while other fruit are still immature. To minimise

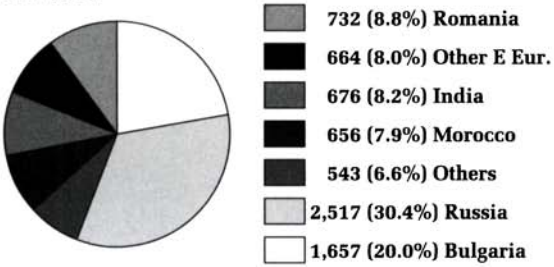
Table 18

Imports: Coriander
1994, Tons



Total Tons 8,289

Origins: Coriander
1994, Tons



Source: Eurostats

Total Tons 8,289

losses, plants should be cut and windrowed when half to two thirds of the fruit are ripe, and left for a few days to allow ripening to be completed. Plants are then threshed. Yields vary widely, in the range 500 to 1,500 kg/ha.

After harvest, fruit are dried to 9% moisture content. Fruits at harvest have around 20% moisture content, and once levels are below 18% temperatures up to 80 to 90^{o}C can be used under artificial drying without significant loss of volatile oils. The oil is produced by steam distillation, and the oleoresin by solvent extraction.

Exporters

World trade in coriander is in the region of 30,000 to 40,000 tonnes. The main producers are the Russian Federation, Bulgaria and Rumania, Morocco, Egypt and India. Morocco has traditionally been the main exporter, supplying around 5,000 to 10,000 tonnes of coriander seed. The Russian Federation has recently become a major source of coriander seed and exports have risen in the last five years to more than 5,000 tonnes. India is a major grower of coriander, and exports vary from 5,000 to 10,000 tonnes. Russian and other East European sources supply the small seeded

type to the extraction sector. North African origins and India supply the large seeded type to the whole spice market. The European market is small relative to countries like Sri Lanka, Saudi Arabia and Iran. Principal exporters to the EU are shown in Table 18.

Exports of coriander oil are dominated by Russia which exports large quantities (over 20 tonnes). Other minor exporters are Poland (2 tonnes), Bulgaria (2 tonnes) and Romania (1 tonne).

Importers

Customs Code: 0909 20 (Table 18)

The trade frequently divides coriander into three groupings.

Group A - Small seed fruits of high volatile oil content coming from Russia, Poland and Hungary

Group B - Large fruits having low volatile oil content coming from India, Indonesia, Morocco and Egypt

Group C - Fruits midway between Group A & B in terms of size and oil content coming from Czech Republic, Slovakia, India and Romania

EU imports of coriander seed are in the region of 8,000 to 9,000 tonnes (8,289 tonnes in 1994). The UK (2,526 tonnes), Netherlands (2,455 tonnes) and Germany (2,428 tonnes) are the major markets, accounting for almost 90% of imports. The demand is dominated by the small seeded type for processing.

Re-exports

There is a limited re-export trade mostly based on the Netherlands supplying the German and UK markets.

Prices

Coriander seed prices vary substantially according to origin. Seed from Romania and the CIS is available at around US$ 750/tonne. Moroccan and Egyptian is nearer US$ 800 to US$ 900/tonne while Indian is as high as US$ 1,000 to US$ 1,100 /tonne.

Coriander seed oil mainly comes from the CIS at around US$ 20 to US$ 30/kg. Indian Coriander oil is more than US$ 50/kg.

Demand and Opportunities

The former Soviet Union used to grow coriander to produce the aromatic chemical linalol. Demand for linalol ex Coriander has fallen dramatically with the result that very large quantities of coriander seed are now available from Russia and to a lesser extent Rumania, Poland and Bulgaria. New entrants would be better to concentrate on the large seeded varieties for the ground spice market coming from India and Egypt where export prices still remain high.

GINGER

Ginger *(Zingiber officinalis)* is a tropical crop whose rhizomes produce an aromatic spice which is widely used in Asian, Caribbean and African cuisine. In Europe ginger is used in domestic cooking, and in a wide range of drinks, confectionery, bakery and processed meat products.

Form

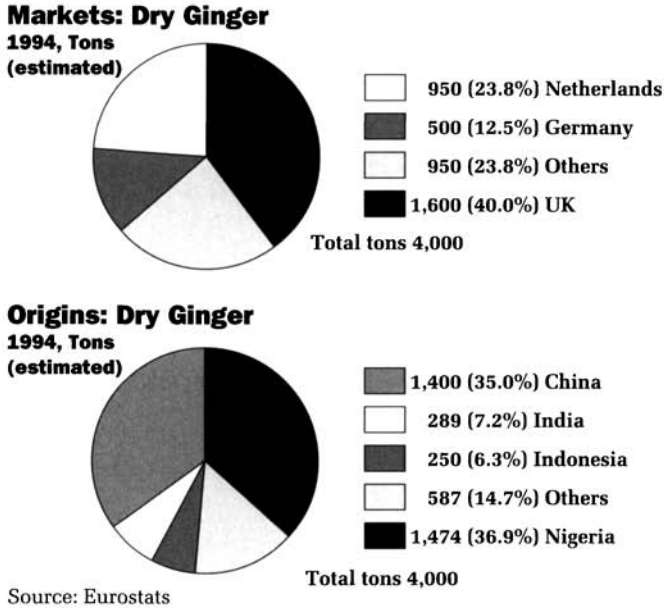
The major products are dried ginger, ground ginger, ginger oil and ginger oleoresin. Dried ginger is sold as whole rhizomes commonly known as ginger root, either peeled or unpeeled. It is also sold as slices or splits (rhizomes sliced lengthways). These irregular shaped rhizomes are tough, fibrous and vary in colour from dark grey/brown to pale cream depending on origin and processing. Bleached ginger has been treated with sulphur. The product is usually supplied to the consumer as ground ginger, a fine mid-brown to pale yellow powder. Lighter coloured ginger has traditionally been more highly prized for its subtle lemony aroma. Dark ginger has more heat and is favoured for extraction purposes.

Fresh ginger is a vegetable and not considered as a spice. Preserved ginger (immature fresh ginger preserved in sugar or brine) is used as a confectionery or vegetable product, particularly in the Far East.

Production and Processing

Ginger is tolerant of a wider range of conditions than most spice crops. It is grown at altitudes up to 1500 m though frost destroys foliage and exposed rhizomes, and low temperatures induce dormancy. Optimum temperatures are in the range 25 to 32^{o}C, with minimum temperatures around 17^{o}C. Hot sun can result in leaf scorch, particularly when the crop is young. Rainfed crops require a minimum of 1,000 to 1,200 mm rainfall during the 8 month growing season; the optimum rainfall would be over 2000 mm. Dry conditions will result in low yields and small

Table 19



Source: Eurostats

sized rhizomes. The crop requires a fertile, well drained soil, of moderate pH (6 to 6.5).The crop is very sensitive to waterlogging. Heavy soils restrict rhizome development and make harvesting difficult. The crop responds to high humus levels and the addition of organic matter. Ginger is propagated vegetatively, using selected healthy rhizomes. Typical seed rates are in the range 1,500 to 1,700 kg/ha, but for early high yields rates up to 3,000 to 4,000 kg/ha can be used. The crop is grown on ridges. Great care must be taken to avoid bacterial wilt and other rhizome rots, and nematode infections.

For the spice market, varieties with high oil (min 2%) or extract (min 6%) levels should be selected. Length of the crop growing season also varies with end product requirements. For preserved ginger, immature rhizomes are harvested at 4 to 6 months; for fresh ginger, rhizomes are harvested at maturity (7 to 9 months); for the dried spice and oil and oleoresin uses, the rhizomes are harvested when fully mature.

After harvest, ginger for the spice market is washed and dried to 10% moisture content. The rhizomes may be peeled, or scraped prior to drying to remove the outer skin. Simple sun drying is usually used, though artificial drying would give a substantially improved product. The oil is produced by steam distillation, and oleoresin by solvent extraction.

Exporters

The main exporters of dried ginger are China, Nigeria and India. Jamaica is a small niche origin, and Indonesia (which has substantial fresh and preserved industry) is increasing production. Nigeria and China are the major suppliers to Europe (Table 19). At present Indian supply is restricted (under 300 tonnes in 1994, down from over 800 tonnes in 1992), and high priced, and Nigeria is substantially down on earlier export levels (1,474 tonnes in 1994 compared with 2,212 tonnes in 1992). Suppliers of ginger oil and ginger oleoresin are India, China, Indonesia and Sri Lanka. A small facility exists in Jamaica. Exports of oil and oleoresin from origin are limited, estimated at around 30 tonnes. The bulk of industry's requirements are produced in the EU from imported dried ginger. Exports of dried ginger into Europe are small relative to the markets of Japan, Middle East and South Asian.

Imports

Customs Code:0910 10 (Table 19)

Imports of dried whole ginger and powdered ginger can only be estimated as official statistics combine fresh and dried ginger under one heading. Total dried ginger imports are estimated at around 4,000 tonnes. The UK is the major import market (around 1,600 tonnes), followed by the Netherlands (950 tonnes), and Germany (500 tonnes).

Re-exports

The re-export trade is almost exclusively based on the Netherlands re-exporting product to Germany, the UK and France, estimated at 500 to 700 tonnes.

Prices

Ginger prices differ greatly according to origin and cleanliness. The benchmark import price for dry ginger is typically in the range US$ 700 to US$ 1,000/tonne. In the current market situation with supplies from both India and Nigeria restricted, prices are at the upper edge of the range. For poor quality product (mouldy etc), or if product is dumped in the market, prices will fall to under US$ 600/tonne. Indian (Cochin) ginger has usually traded around US$ 1,200/tonne, but current prices are very high at over US$ 2,500/tonne. Jamaican ginger has a particular niche market and sells in the range US$ 5,000 to US$ 6,000/tonne. Prices in Germany appear to be higher than anywhere else in Europe.

Ginger oil prices vary according to strength and purity (zingerbone content). Chinese oil sells at around US$ 22 to US$ 30/kg, Indian US$ 40 to US$ 50/kg and Sri Lankan at around US$ 65 to US$ 70/kg, and have been rising recently. Ginger oleoresin tends to sell at between US$ 40 and US$ 50/kg

Demand and Opportunities

The demand for dry ginger is largely static. China, India and Nigeria each have their own particular segment of the market due to variations in flavour and oil content. Most buyers are to some extent able to substitute one origin for another if shortages occur from any one origin. The same cannot be said for Jamaican ginger.

Opportunities for new suppliers are largely restricted to supply of high quality product to grinders supplying the retail markets. Buyers are looking for clean, well flavoured, artificially dried product with high hygiene levels, in contrast to the bulk of the material in the market which has been sun dried on the ground.

PAPRIKA (NON PUNGENT CAPSICUMS)

Paprika is cultivated from selected cultivars of *Capsicum annuum*. The spice is widely used in Central European cooking to provide colour and a sweet, smooth, subtle flavour. Paprika is also an important natural food colouring providing red and orangy red colour to a wide range of food products.

Forms

Paprika for household use is sold as whole product (around 20% of supply) or as dried ground or crushed powder (around 80% of supply). The berries differ widely in size (0.8 to 12 cm long) and colour (from yellow brown to brick red). Paprika oleoresin is one of the most important spice extracts used in the food industry.

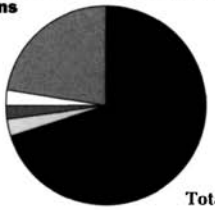
Paprika is primarily graded by colour content (typically measured in ASTA colour units). Colour content is determined by variety, growing conditions, harvesting, whether the product is shade or artificially dried and finally whether the seeds and placenta have been removed prior to grinding and/or extraction. Some grades also have specified (low) levels of pungency (% capsaicin). The main ground paprika blends traded in Europe follow German terminology - noble sweet (edulsuss), semi-sweet (halbsuss), rose (rosen), hot (sharf) and delicate (delikat).

Production and Processing

Varieties should be selected carefully to give high and consistent colour values and very low pungency levels. It is a 4 to 5 month crop of the warm (continental) temperate zone and the sub-tropics and tropics. It is best grown in seasonal rainfall climates with at least 600 to 900 mm rainfall during the season where the fruits can be left to partially dry on the crop at maturity. It is not tolerant to frost, and does not grow well where average temperatures are below 12 to 15^{o}C. Temperatures above 32^{o}C cause flower drop and can reduce yields substantially. High ambient temperatures lead to the development of

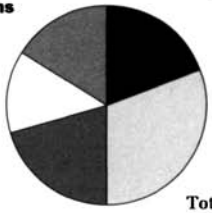
Table 20

Imports: Whole Sweet Capsicums
1994, Tons



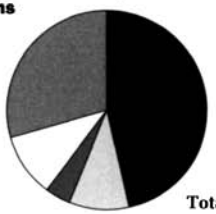
1,300 (22.3%) Germany
156 (2.7%) UK
122 (2.1%) Netherlands
171 (2.9%) Others
4,092 (70.1%) Spain
Total tons 5,841

Origins: Whole Sweet Capsicums
1994, Tons



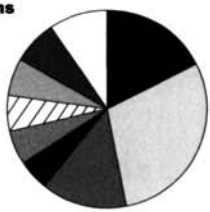
929 (15.9%) S.Africa
789 (13.5%) China
1,189 (20.4%) Others
1,801 (30.8%) Morocco
1,133 (19.4%) Zimbabwe
Total tons 5,841

Imports: Crushed/Ground Capsicums
1994, Tons



7,286 (29.3%) Germany
2,588 (10.4%) UK
1.014 (4.1%) Netherlands
2,376 (9.6%) Others
11,571 (46.6%) Spain
Total tons 24,835

Origins: Crushed/Ground Capsicums
1994, Tons



2,320 (9.3%) Hungary
1,769 (7.1%) India
1,562 (6.3%) China
1,406 (5.7%) Brazil
1,398 (5.6%) USA
1,205 (4.9%) Zimbabwe
3,449 (13.9%) Others
7,349 (29.6%) Morocco
4,377 (17.6%) S.Africa

Source: Eurostats

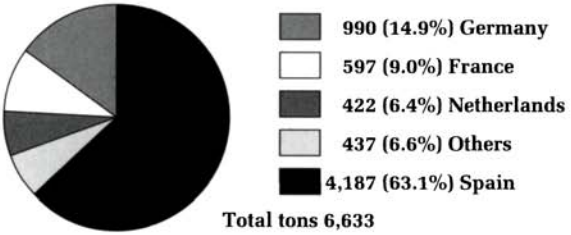
Total tons 24,835

pungency in the crop, which reduces its value. High yields require fertile, well drained soils, and adequate rainfall. It can either be directly seeded in the field or sown in nurseries and transplanted. Seed rates are in the range 5 to 10 kg/ha; for nursery operations, 1 kg of seed should give sufficient transplants for 1 ha. The crop suffers from a wide range of potentially serious pest and disease problems.

After harvest the fruits are dried to below 10% moisture content. Simple sun drying is commonly used, but this reduces colour values and leads to increased rates of colour loss during subsequent storage. Artificial drying systems (using indirect fired driers) give a higher quality product. Oleoresin is produced by solvent extraction of the ground paprika.

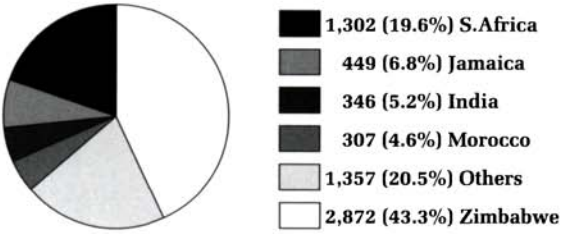
Table 21

Imports: Other Whole Capsicums
1994, Tons



Total tons 6,633

Origins: Other Whole Capsicums
1994, Tons



Source: Eurostats

Total tons 6,633

Quality grades are summarised below:

	Grade 1	Grade 2	Grade 3
Hungary	Capsaicin free Delicate Extra sweet	Semi-sweet	Rose Pungent
Spain	Extra	Selecta	Corriente
Yugolslavia	Extra delicate Delicate Red sweet	Red pungent Rose	Pale red pungent Red sweet

Exporters

Western Europe itself is one of the major world producers and exporters, exporting in the range 12,000 to 15,000 tonnes. Morocco is the major supplier to Europe (9,150 tonnes in 1994), followed by South Africa (5,306 tonnes in 1994), Zimbabwe (2,338 tonnes) and Hungary (2,320) Table 20, 21). Exports from Morocco have grown as production has shifted there from Spain. Exports from Hungary are declining (from earlier levels of around 4,000 tonnes) due to rising costs and political change. Brazil, India and Israel are new entrants of growing importance. The USA and Mexico are major world producers, and the USA also exports to Europe (1,398 tonnes in 1994).

Europe is also a major producer and exporter of the oleoresin, producing 800 to 900 tonnes/yr. Morocco, South Africa, Israel and to a lesser extent Hungary and Ethiopia are also exporters of oleoresin, and production is expected to start in India.

Importers

Custom codes: 090420/0904210/09042031/09042035/09042039/09042090 (Table 20 & 21)

European imports of paprika can only be estimated as trade statistics combine them with pimento and pungent capsicums. Imports are dominated by Spain and Germany, accounting for around 80% of all European imports. Total imports from non-European origins are around 30,000 tonnes. (Over 5,000 tonnes of fresh or chilled paprika is imported into the EU mainly from Morocco or Turkey.) Spain has rapidly become the main importer of paprika in Europe, with imports rising from only 2,000 to nearly 16,000 tonnes in five years. This trend is expected to continue as domestic production is replaced by lower cost imports. No other country imports more than 3,000 tonnes.

Estimates of world oleoresin output is more than 1,500 tonnes, with Spain producing 50% of this figure and the USA, the UK, France and the Netherlands a further 30%. European producers blend product from many

different sources prior to sale. EU imports of paprika oleoresin are estimated at around 250 tonnes, mainly from the USA, Morocco and Israel. Germany is the world's leading importer of oleoresin paprika which is a vital ingredient in its meat processing industry. The UK, the Netherlands and France also import paprika oleoresin usually from Spain but also from the USA, Morocco and South Africa.

Re-exports

There is a growing re-export trade within Europe with Spain as the primary point of import for the European market.

Prices

Prices of whole dried paprika are strongly influenced by harvests in Spain, California and Hungary. Fluctuations are large from year to year. Paprika powder or processed extracts are assessed by their colour intensity, usually in terms of ASTA colour units. The stronger the colour the higher the price. Prices for 110 to 120 ASTA unit paprika powder range from around US$ 2.5 to US$ 2.8/kg. Prices rose steadily through the 1980s and early 1990s but have tended to decline recently as many new entrants appeared on the market. Unit prices of paprika in Germany have dropped from 4.8DM/kg to 3.8DM/kg during the last five years.

Paprika oleoresin prices tend to follow those of paprika powder (from which they are made). Prices are usually directly correlated with colour strength. Standard 40,000 ASTA unit oleoresin was formerly selling at around US$ 26 to US$ 29/kg but has fallen back to around US$ 20 to US$ 22/kg due to increasing new supplies.

Demand and Opportunities

There is very considerable variation in the consumption of paprika within the EU. Only in Germany, Spain and Central Europe is paprika a flavouring of real importance. The use of paprika as a colouring material (both the ground spice and the oleoresin) has tended to increase as demand for processed meat products has grown, and this has broadened the basis for demand and maintained growth in the market. The decline of production in Spain, and also in Eastern Europe, presents continuing opportunities for new low cost suppliers. Spain remains the best market to target given its central role in the European trade. New suppliers must pay great attention to hygiene issues for this crop if they are to have any chance of breaking into this market.

PEPPER

Pepper *(Piper nigrum)* is a climbing vine of the humid tropics whose whole dried berries are used to produce the pepper of commerce. Pepper is the world's largest spice product. It has a wide range of household and industrial applications. Whole and ground pepper are commonly found in households throughout the world. Pepper oil and oleoresin are used in a very wide range of processed foods.

Form

The major products are whole black and white pepper. Ground pepper (black and white) is a major traded item. The oil and oleoresin are also items of trade. Other specialised products include brined green and red pepper berries, and pepper paste.

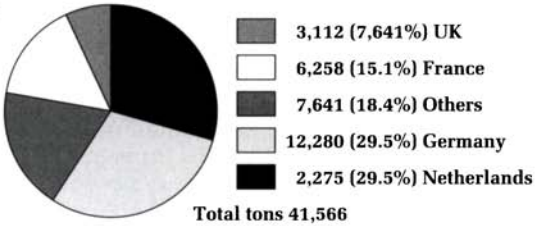
Production and Processing

Pepper is a crop of the wet, humid tropics. It is a climbing vine, and requires support. It requires a high (>2,000 mm), well distributed rainfall over an 8 to 10 month growing season. The crop requires high temperatures and high humidities. The crop can tolerate temperatures in the range 10 to 40^{o}C, but optimum temperatures are in the range 25 to 35^{o}C. Good fertility is required for high yields. Soils should be well drained, preferably with a high organic matter content to give good water and nutrient holding capacity. Soil pH should be pH 6 to 7. The crop can be grown under partial shade, usually provided by live support trees. The crop is propagated from cuttings, with plant populations up to 2,000/ha. Selection of elite plant material is essential, affecting both level and consistency of yield, consistency and quality of product and resistance to soil-borne diseases.

Berries are ready for harvest 6 to 8 months after flowering. Flowering spikes are removed when plants are under 2 years old so that maximum vegetative growth is made. At harvesting, whole spikes are harvested. Several harvests have to be made as the crop ripens progressively. Time of

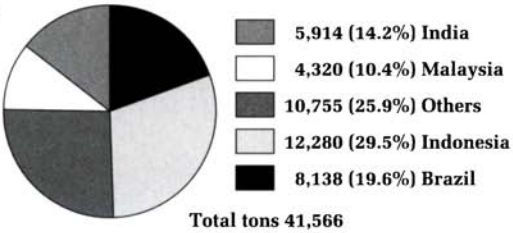
Table 22

Markets: Whole Pepper
1994, Tons



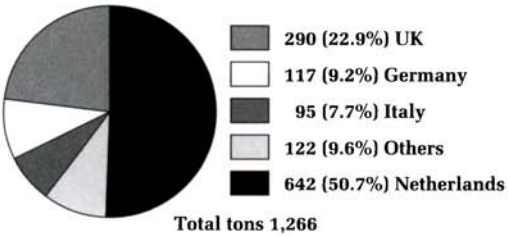
Total tons 41,566

Origins: Whole Pepper
1994, Tons



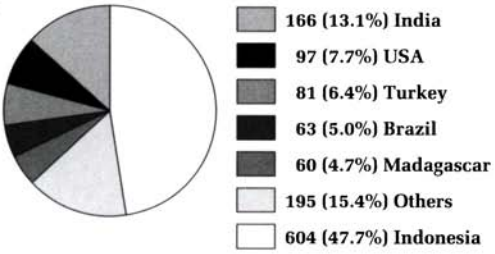
Total tons 41,566

Markets: Crushed/Ground Pepper
1994, Tons



Total tons 1,266

Origins: Crushed/Ground Pepper
1994, Tons



Source Eurostats

Total tons 1,266

harvesting depends on the product required. For black pepper, the berries are harvested at the mature green stage when the first berries on the spike turn red. For white pepper, fully mature red berries are harvested. Yields of fresh berries vary widely according to variety, age, growing conditions and management. The range is between 1,000 kg/ha and over 10,000 kg/ha.

For the production of black pepper, harvested berries are stored in a pile for 1 to 2 days, to start the colour change, and are then dried to 10 to 12% moisture content. Out-turn fresh:dry is around 30%. For the production of white pepper, berries are harvested at the fully red stage, are stripped from the spikes and left in running water until the outer pericarp is soft and can be removed by rubbing. The berries are then washed again and dried. Out-turn fresh:dry is around 25%. After drying, black and white pepper are graded to remove small and damaged berries.

Pepper oil and oleoresin are produced from black pepper. Varieties differ considerably in terms of their volatile oil content.

Exporters

Pepper exports are dominated by the five main producers: India, Indonesia, Malaysia, Brazil and Vietnam (Table 22). Other small but important exporters are Thailand, Sri Lanka and Madagascar. Overall world trade in pepper averages around 147,000 tonnes per annum. Exports fluctuate widely depending on stocks and harvesting conditions. Exports in 1987 were as low as 108,000 and rose to over 166,000 in 1991.

1995 estimates of world exports of whole pepper are Brazil 17,500 tonnes, India 25,000 tonnes, Indonesia 38,000 tonnes, Malaysia 18,000 tonnes and Vietnam 15,000 tonnes. Indian exports have tended to decline as local consumption and competition from Brazil and Malaysia has increased. Vietnam has increased exports substantially in the last ten years from little more than 7,000 tonnes in 1989 to more than 15,000 tonnes today. China have also begun to export small quantities of pepper. White pepper is almost all exported to Europe. It represent about 65% of EU pepper imports although less than 20% of world trade. Most of this comes from Indonesia.

Exports of ground pepper from origin is as yet small relative to total pepper exports. Total exports are around 2,500 to 3,000 tonnes of ground black pepper and 4,000 to 4,500 tonnes of white pepper.

The export of pepper oleoresin from Asia has grown substantially in the last ten years. Oleoresin extraction capacity in India, Indonesia, Singapore and Malaysia is believed to be around more than 400 tonnes - well in excess of demand. Pepper oleoresin is one of the most important oleoresins traded with nearly 500 tonnes being processed. 40% to 45% of this market is in Europe, the remainder mostly in North America. The UK and Germany are the major buyers of pepper oleoresin mainly from the USA, India, Singapore or other European countries. India contributes 35%, the UK 30%,

Singapore 15%, the USA and Canada 10%, Indonesia 7.5% and Malaysia 2.5%. Sri Lanka has also started pepper oleoresin exports.

Pepper oil is a small but high value export product. Production is estimated at 30 to 40 tonnes, of which the majority is produced in India (10 to 12 tonnes), Indonesia, Madagascar, the UK, and the USA.

The International Pepper Community (IPC), formed in 1972 and based in Jakarta, consists of members of seven pepper exporting countries including Sri Lanka, Micronesia and Thailand plus founding members Indonesia, Malaysia, Brazil and India. It aims to regulate the market for pepper and promote pepper sales worldwide.

Imports

Customs Code: 0904 11/0904 1110/0904 1190/0904 12 (Table 22)

EC imports of pepper have grown from around 48,000 tonnes in 1989 to nearer 51,000 tonnes in 1994. The majority is black or white whole pepper. Imports of ground pepper from outside Europe are less than 4,000 tonnes. Germany is by far the most important market with imports rising from 15,000 to 17,000 during the last five years. France is the second largest importer with imports of around 10,000 tonnes. The Netherlands is a major entrepot centre for pepper, with imports of more than 8,000 tonnes annually. There is little or no brand loyalty to pepper from any one particular origin at retail level.

Re-exports

There are considerable re-exports of pepper, particularly from the Netherlands. The Netherlands exports 3,000 to 5,000 tonnes of unground pepper and 650 to 700 tonnes of ground pepper each year. Worldwide, Singapore is the chief entrepot for pepper, importing, cleaning, processing and packing 30,000 to 50,000 tonnes of pepper per year.

Prices

Pepper is an internationally traded commodity, quoted forward and spot on the New York Commodity Exchange. Durng the mid-1980s pepper prices rose to all-time highs of 230 to 250 cents/lb. This encouraged massive plantings which have now fully matured. By the early 1990s prices had fallen to around 50 to 60 cents/lb, causing widespread hardship in the industry. Spot prices have firmed somewhat since then due to poor harvests in Indonesia but five-year cyclical patterns in pepper prices are common. Black pepper prices are lower than white. Black sells at around US$ 2,500 to US$ 3,200/tonne while white pepper is between US$ 3,900 and US$ 4,000/tonne.

Prices of pepper oleoresin tend to follow closely those of the main spice, although oleoresin can be stocked so that price fluctuations are lower than

for the raw spice. Prices vary from around US$ 7.5/kg to US$ 8.5/kg depending on concentration levels.

Demand and Opportunities

There is a marked variation in the pattern of demand for different forms of pepper. The UK prefers white pepper while France buys mainly black pepper. The overall split between white and black pepper in Europe is 60%:40%.

The collapse of bilateral trade between the former Soviet bloc countries and pepper exporters disturbed the market in the early 1990s, with a drastic decline in imports to the CIS and Eastern Europe. (Exports to this region fell from around 25,000 - 30,000 tonnes to 9,000 - 12,000 tonnes). Demand for pepper has, however, been rising again recently, with the fastest growth in the newly developing industrial economies such as Korea, China and Venezuela.

The scale of the market and the annual variability of crop sizes offer potential for new entrants. However, very small volume origins (a few hundred tonnes) are of little interest to the trade, given the scale of trading. Black pepper offers a simple route into the trade, and there is interest in high extract (piperine) content pepper for the extraction market.

SAFFRON

Saffron is the dried stigmas of the flowers of *Crocus sativus*, one of the most valuable of all spices commercially sold. It has been used since biblical times to provide flavour and colour to Asian and Mediterranean foods. Its principal use is in domestic and commercial cooking of certain traditional foods (certain curries, paella etc) and in various medicinal remedies. Its use as a natural colouring agent has largely disappeared due to the high cost of saffron.

Forms

Saffron is sold in whole or crushed form. At the import/wholesale level, saffron is traded in 1/2kg or 1kg tins. At the retail level it is traded in small sachets or vials containing a few grams. There are three main grades: "Mancha", " Rio" and " Sierra" (see specifications). More detailed grading is given below.

Very Select	• Stigma length over 30 mm with style length 23 to 24 mm; brilliant colour and strong aroma.
Select	• Stigma length 30mm with style length 23 mm; hard brilliant dark red colour, thick thread and good odour.
Superior	• Stigma length 28mm with style length 22 mm, whole strong threads, dark red colour.
Medium	• Stigma length 25mm with style length 21 mm, good odour, colour and appearance.
Ordinary	• Stigma length generally 20 to 24 mm with same length style and having a pleasant odour.
Slack	• Broken stigmas, dark in colour and less than 20 mm in length. It includes all saffron which, even if the thread is longer, lacks many of the properties of the better types.

Very small amounts of crocine, a colouring extract of saffron, are sold for specialist food applications.

Production and Processing

Saffron is a perennial crop. It is an autumn flowering cultivated form of *Crocus sativus*. The crop requires a temperate or sub-tropical climate. It becomes dormant in spring, and is not affected by very hot and/or dry summers, growth beginning again in autumn. The crop is tolerant of frosts, except at flowering. The crop requires rainfall at the end of summer/early autumn to initiate growth and flowering, and reasonable moisture conditions at the end of the season (late winter/early spring) when new corms are being formed. Rainfall during flowering reduces quality. Total rainfall requirements vary widely depending on climate during the growing season. In many areas, total rainfall is less than 400 mm.

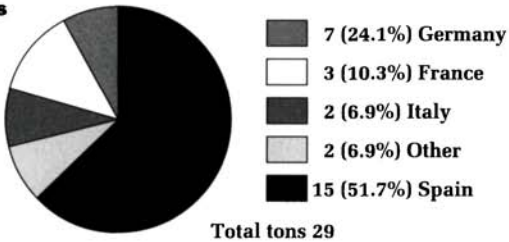
The crop is propagated vegatively, by corms. Cormlets are produced after flowering by the mother corm. At the end of the season the mother corm dies, and the cormlets give the next season's flowers. The crop requires a light well drained soil. Corms are planted 12 to 15 cms deep, 10 cms apart, with 20 cms between rows (500,000/ha). Cormlets are produced above the mother corm, so that fields require replanting every four years as corms rise close to the surface. The crop flowers over a four to six week period in autumn, individual plants flowering over a two week period. Repeated harvests are made during the season. Flowers have to be picked by hand in the early morning of the day of opening, and stigmas removed and dried on the same day. The harvest from approximately 165,000 flowers gives 1 kg of dried whole saffron. 1 ha should yield 7 to 10 kg of dried saffron. Stigmas are cut out of the flowers by hand, and dried. Extreme care must be used in drying to avoid any damage or loss of aroma quality from the product. Stigmas are often still sun dried but colour is lost, quality is lower, and the risk of moulds and other post- harvest problems is higher than if artifical drying is undertaken.

Exports

Europe is a major production centre for saffron. Exports outside the EU are little more than 0.25 tonnes. Spain is overwhelmingly the most important grower, producing between 35 and 40 tonnes, 80% to 90% of world output. Production is declining because of the very high harvesting costs. Some is also produced in Italy, France, Iran, Northern India (Kashmir) and Morocco. Spain's official exports are reportedly as high as 200 tonnes, but this probably includes blended and add-mixture products, particularly using material from Iran and Morocco. Iran exports less than 50 tonnes, of which around half comes to Europe (Table 23). Greece exports 5 to 8 tonnes of saffron. Indian production is almost all for domestic use and has declined drastically due to political disturbances in Kashmir. Indian exports to Europe are small because of strong local demand. Exports have seldom

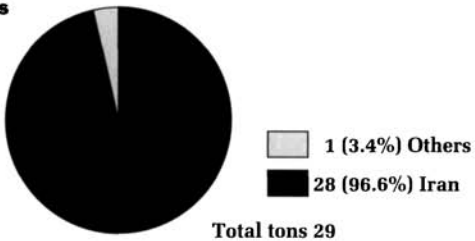
Table 23

Imports: Whole Saffron
1994, Tons



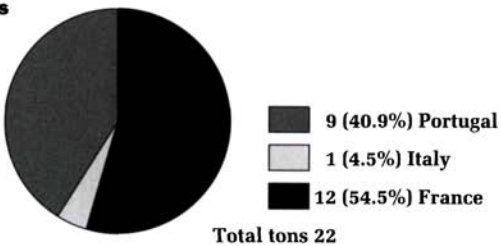
Total tons 29

Origins: Whole Saffron
1994, Tons



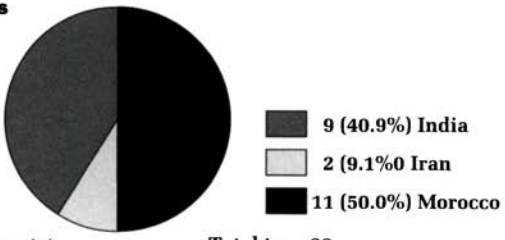
Total tons 29

Markets: Crushed/Ground Saffron
1994, Tons



Total tons 22

Markets: Crushed/Ground Saffron
1994, Tons



Source: Eurostats

Total tons 22

exceeded 500 kg. Iran's exports to the EU in 1992 were valued at more than US$ 7 million.

Imports

Customs code: 0910 20/0910 2010 (Table 23)

EU imports of saffron range between 25 and 35 tonnes per annum, about 60% as whole filaments and 40% in crushed or ground form (this probably includes some blended product). Spain is the leading importer. Imports have grown dramatically from around 8 to 10 tonnes in the late 1980s to more than 25 tonnes in 1993 and 1994. This is to supplement declining local production. France imported 7 to 12 tonnes. Germany and Italy import around 4 to 7 tonnes of saffron a year.

Prices

These vary according to grade and origin. The price range is very great, ranging from US$ 650/kg to US$ 900/kg. 1st quality (Mancha) saffron is selling at 4,500 FF/kg on the French market with 3rd quality (Sierra) at around 3,000 to 3,500 FF/kg. Iranian saffron is nearer 2,500 FF/kg.

Re-exports

Both Spain and France have a considerable re-export trade. Between them they supply most of the rest of Europe's domestic and industrial requirements.

Demand and Opportunities

European demand for saffron centres around the traditional domestic consumers in Spain, Italy and southern France as well as the top class restaurant trade throughout Europe. The ethnic market is also important. The colour extraction market is small. Ever increasing costs of production in Spain have tended to push prices higher, especially for guaranteed pure material. Exports from Iran have picked up again as peace and political stability have been restored. Climate, soil and the high level of labour and skill needed to grow and process the crop limit new entrants.

Opportunities for new suppliers do exist provided a consistently high quality product can be supplied. Given the very high unit value of the product, any probability that the product might be adulterated or of variable quality will be reflected by severe price reduction and loss of market interest. Development of production requires large volumes of plant material (around 500,000 corms/ha). Great care must be taken to ensure that any import/rapid multiplication programme for planting material is based on high quality material with proven market demand. Adequate harvesting labour must be available for the short, intensive harvesting season.

TURMERIC

Turmeric *(Curcuma longa)* is a tropical rhizome which has been used for culinary and cosmetic purposes since antiquity. Turmeric is the basic ingredient in almost all curry powders and a major source of natural colouring for foodstuffs and pharmaceutical and cosmetic applications. The colour ingredient in turmeric is known as curcumin. It is found in margarine, mustards and soup powders. It is commonly used as a substitute for the much more expensive spice, saffron.

Forms

Turmeric is marketed as dried whole and ground rhizomes. High colour content 'Alleppy' types (5% to 6.5% cucurmin content) are mainly sold to the colouring industry. 'Madras' and Rajpuri types (3.5% cucurmin content) are mainly sold into the spice market. Madras rhizomes are polished. An oleoresin is also produced for the colouring industry. The most concentrated product is a spray dried 95% curcumin powder. The product is typically sold as whole fingers, with grinding being done in the importing countries. The ground product is stable in storage and hence relatively well suited to grinding at origin.

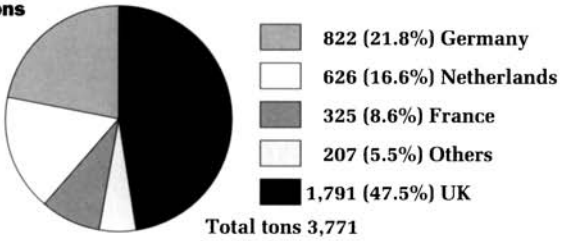
Production and Processing

Production requirements and practices are very similar to ginger. The crop is propagated vegetatively, by rhizome, and seed rates at planting are typically in the range 1,500 to 2,000 kg/ha. Two main types of turmeric are recognised: the 'Alleppy' type and the 'Madras' type. The crop is harvested at maturity, seven to nine months after planting, depending on variety characteristics and season. Fresh yields are in the range 15 to 25 t/ha. Conversion of fresh to dry yield is in the range 15 to 25%. Minimum commercial dry yields of 2.5 t/ha should be targeted, but yields in excess of 3 to 4 t/ha can be achieved.

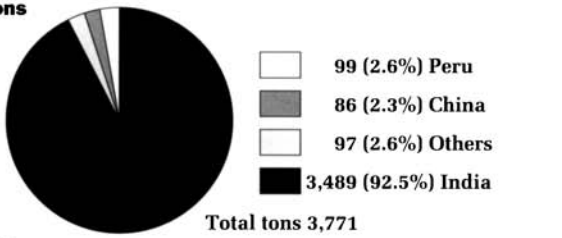
After harvest the fresh rhizomes are washed,

Table 24

Markets: Turmeric
1994, Tons



Origins: Turmeric
1994, Tons



Source: Eurostats

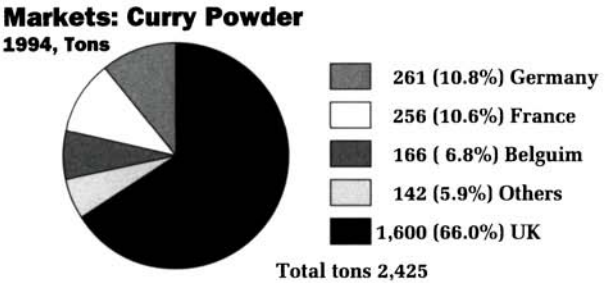
boiled and dried. Rhizomes are boiled in water for around 60 minutes until they can be pierced with a fork, then immediately removed from the water, spread out to cool, and dried. Traditionally, turmeric is sun dried, but the process is lengthy (10 to 15 days), can be spoiled by rain, and increases risks of contamination by pests and diseases. Artificial drying, using indirect fired driers, should be used. Drying should be done at 55 to 65^{O}C. Moisture content should be reduced to 6 to 8%. When properly dry, rhizomes should break with a clean 'snap', the broken ends showing a glazed surface with a clearly marked dark ring just inside the skin.

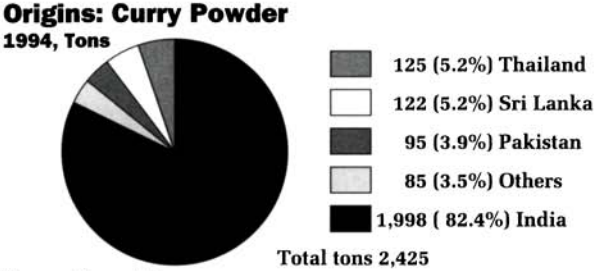
Madras type turmeric, sold as a spice, has to be polished after drying. The dried fingers are put in a rotating drum, and the tumbling action removes the outer skin, giving a matt yellow finish to the surface of the rhizome. Boiling and polishing make Madras turmeric a relatively expensive crop to process. Weight loss during polishing is around 5%.

Exports

World trade in turmeric is between 15,000 and 20,000 tonnes. India dominates the production and export of turmeric worldwide (mainly from Andra Pradesh, Kerala, Tamil Nadu and Maharashtra). Only 5% of India's total production of around 150,000 tonnes is exported. Other important suppliers are China, Peru, Thailand and Indonesia.

Table 25





Source: Eurostats

Exports of turmeric to the EU market are relatively small compared with Iran and the Middle East where turmeric is used to add flavour and colour to many rice based dishes. Turmeric oleoresin exports almost all come from India. Total exports are around 35 to 40 tonnes, mainly to the USA.

Imports

Customs code: 0910 30 (Table 24 & 25)

EU imports are between 3,000 and 3,500 tonnes per annum. The UK is the largest market, with imports having risen from around 1,500 to 2,500 tonnes during the last five years. This reflects the growing Asian community and the popularity of Indian foods in the UK. 70% of consumption is for curry powders, the remainder for colouring extracts. Germany is the second largest market, with imports rising from around 485 tonnes to 880 tonnes in the last five years. These are used in mustard and curry sauces. Some special forms of turmeric are imported for use in natural pharmaceutical products. France and the Netherlands import around 600 to 700 tonnes each.

Re- exports

These are mainly from Singapore, although turmeric products, either pure

or as the main ingredient in curry powder, are exported from the UK to other EU countries.

Prices

Alleppy turmeric is sold on the basis of curcumin content. Prices range from US$ 1,200 to US$ 1,400/tonne for 5.5% to 6.0% curcumin product. Madras and Rajpuri turmeric prices range from US$ 1,040 to US$ 1,150/tonne.

Demand and Opportunities

The turmeric market is likely to grow along with that of Asian foods. In countries like the UK and the Netherlands, the major European markets, sales appear static. Growth is likely to come from southern and eastern Europe. The market for turmeric as a natural colouring material is expected to grow throughout Europe and hence increase the demand for turmeric oleoresin and spray dried turmeric extracts.

Despite the dominance of India in the market, and its ability to supply export demand from a very small portion of its domestic crop, new suppliers can find interest in the market. However, it is important for prospective suppliers to select planting material carefully to match the target market demand - whether for colouring or spice useage.

VANILLA

Vanilla is a climbing vine, of the Orchid family. Almost all commercially cultivated vanilla is the species *Vanilla fragrans* syn. *V. planifolia*. Vanilla has many food applications, in ice creams, yoghurt, cakes and confectionery goods, and is also used in soft drinks and perfumery products. Cured whole vanilla beans and ground vanilla powder are used directly in domestic cooking.

Forms

Vanilla is mostly sold as cured whole beans, or lower grade cuts and splits. Recently, processing innovations have led to the production of chopped beans (for extraction only). Whole beans are graded according to size, shape, appearance (colour, presence of surface markings, degree of splitting etc) as well as vanillin content (see specifications). Vanilla for household use is usually sold in jars or satchets and there has been some development of packing at origin for this market. Vanilla extracts are presently only prepared in importing countries for industrial applications. Unlike other spices there is a well established synthetic substitute for vanilla (vanillin or eythlvanillin).

Most vanilla is used in processed form, usually alcohol extracts. Germany, France, the Netherlands and Switzerland are the main vanilla extracting countries in Europe. Extraction is mainly done by the large multinational flavours and fragrances houses.

Production and Processing

Almost all commercially cultivated vanilla is the species *Vanilla fragrans* syn. *V. planifolia*. French Polynesia cultivates a different species, *V. tahitiensis* (preferred by the perfumery trade). Vanilla is established from cuttings; seed is not used. It requires a hot humid tropical climate with a single dry season of three months. The dry season is required to stimulate flowering. As the dry season becomes longer, conditions

become more marginal. Minimum temperatures should be above 12°C. The crop is surface rooting, and requires a thick organic mulch layer in which to grow. The crop requires partial shade (30 to 50%) and a support up which to grow. Flowers have to be individually pollinated by hand. The beans are harvested as they become ripe, about nine months after pollination. The crop requires a high labour input, and is usually grown in small farmer plots. Root rots are the major disease problem, and great care must be taken not to overstress the plant (through poor management or excessive yields), or the incidence will rise dramatically.

When the beans are ripe they are harvested and immediately cured. About 5 kg of fresh beans are required to produce 1 kg of cured beans. There are three stages to curing: killing the bean; sweating; and slow drying and maturation (conditioning). Once they have reached around 25% moisture content they are graded and packed in boxes for the final conditioning stage. Traditional vanilla curing takes one or two months and requires skill and attention. Great care is required to avoid or minimise losses due to pest and disease. Some processors have developed mechanised rapid processing methods. This removes the need for skilled labour but produces a chopped bean product which has a limited, although growing, market.

Exporters

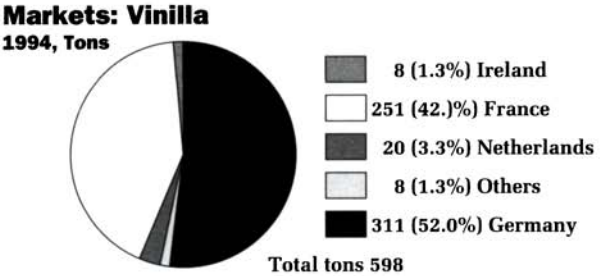
International trade in vanilla is in the region of 1,800 tonnes, of which 1,000 tonnes is of premium quality product. Overall world trade is valued between US$ 50 and US$ 70 million. Madagascar and Indonesia dominate supply with around 70% of world trade. Madagascar exports range from 700 to 900 tonnes/year, and Indonesia 350 to 700 tonnes. Comores is the next largest producer (typically around 150 to 200 tonnes). Smaller quantities of vanilla are exported from Tonga, French Polynesia, Mexico, Reunion and, more recently, Uganda. Supply to the European market (around 600 tonnes) is dominated by Madagascar (around 400 tonnes) (Table 26). Indonesia is traditionally a lower quality source and almost all production (around 95%) goes to the US market.

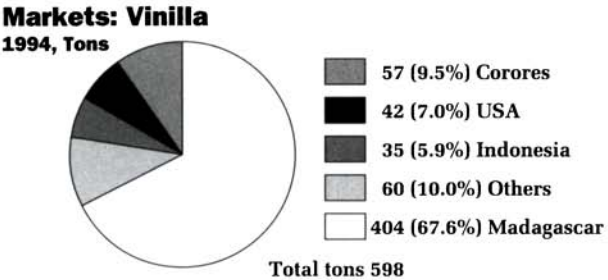
Importers

Customs Code: 0905 (Table 26)

Germany is the largest importer of vanilla in Europe (300 to 350 tonnes). Many of the main traders are based in Hamburg. Germany also has a major extraction industry. France (200 to 250 tonnes) is the second largest importer of vanilla in Europe. It has a long tradition of vanilla packing and processing. No other EU member imports more than 30 tonnes from origin. The European Union as a whole is a much smaller market for natural vanilla than North America, which consistently imports more than 1,000 tonnes annually.

Table 26





Source: Eurostats

Re-exports

There is a large re-export trade within Europe for vanilla both as cured beans (around 280 tonnes) and vanilla extract. Germany and France dominate the re-export trade.

Prices

Until recently the Indian Ocean Island cartel dominated by Madagascar set the benchmark price against which other origins were matched. In the early 1990s this price was set at US$ 74/kg, with other sources selling at US$ 50 to US$ 60/kg. Current prices are substantially lower, with high quality vanilla selling from US$ 45 to US$ 55/kg and low quality vanilla from US$ 20 to US$ 30/kg. Cuts and splits sell at less than US$ 20/kg. Synthetic vanillin prices are, by contrast, US$ 9 to US$ 10/kg.

Demand and Opportunities

There has been a major change in the structure of the vanilla market. During the 1960s and 1970s Madagascar and the other Indian Ocean producers

(Comores, Reunion, Mayotte) operated a cartel (the Vanilla Alliance). This regulated the supply and price of vanilla. To maintain supply and price stockpiles were maintained. This cartel no longer operates, prices have fallen dramatically and suppliers now compete directly with each other in terms of quality and price. Major new vanilla projects are reported in Sri Lanka, India and China.

The market is divided into vanilla destined for the extraction market and product sold as cured bean to the retail and catering trade. The former is by far the larger of the two segments.The mass market for vanilla flavouring is almost entirely served by synthetics (perhaps with very small amounts of added natural vanilla). These synthetics represent 80% to 90% of the total vanilla flavouring market. Unless the use of synthetic vanilla is further curtailed through legislation no sizable increase in demand for natural vanilla is forseen except at the very top end of the market.

Despite the limited growth potential in the natural vanilla market, the breakdown in the Madagascar-based marketing cartel, the current decline in vanilla production in Madagascar, the highly variable volumes of the Indonesian crop, and the development of new processing (curing) technologies provide an opening for new competitive suppliers. New suppliers must focus on the production of consistently high quality cured vanilla through the use of efficient low cost processing systems, and developing long term linkages with major buyers and users by providing a product that is processed to meet their particular specifications. There is no market opportunity or interest for new suppliers of low quality cured vanilla.

CHILLIES AND CAPSICUMS (Capsisum frutescens and others), whole or ground (powdered)

1. Description

Chillies and capsicums are the juiceless dried pods (fruits) of plants of the genus *Capsicum*, particularly *Capsicum annum, C. frutescens, C. chinese, C. pubescens, C. pendulum*. In longitudinal cross-section, the pods are roughly triangular in shape, with the base of the triangle at the point of attachment to the peduncle (stalk). The pods contain variable numbers of yellow-white, hard, disc-like seeds, 1 to 5 mm in diameter. The number and size of the seeds is dependent on the species. The placenta contains the highest concentration of the pungent capsaicinoids. The mature pods may vary in colour from dark blackish-red through orange-yellow to yellow-green, according to the species. Dimensions may vary from 20 to 120 mm long and between 4 and 50 mm in diameter, again according to the species.

Ground powdered chillies and ground powdered capsicums are the products obtained by grinding whole chillies and capsicums, respectively, without any added matter. The powder may be ground to any required particle size, and blends are often made of various chillies/capsicums to maintain a constant "heat strength" (capsaicinoid content) or colour. For international trade, the usual maximum particle size is 500 µm.

2. Odour and flavour

Chillies and capsicums have a characteristic odour, initially pleasant and fruity, followed quickly by a strongly acrid note causing nasal irritation.

Note 1. The characteristic odour becomes stronger when the chillies are rubbed or ground.

Note 2. Chillies, chillie powder and cayenne have a characteristic odour, initially pleasant and fruity and slightly earthy followed quickly by a strongly acrid note causing nasal irritation. The characteris tic taste is initially pleasant, sweet and fruity followed by a strong burning sensation which is very persistent.

3. Freedom from insects, moulds, etc

Chillies and capsicums, whole or ground (powdered), shall be free from living insects and moulds, and shall be practically free from dead insects, insect fragments and rodent contamination visible to the naked eye (corrected, if necessary, for abnormal vision). Minimum ASTA cleanliness specifications are shown in Table 13.

Microbial limits are generally specified when the material is required for further processing.

Indicative limits are:

Salmonella absent in (at least) 25g

Yeast and moulds: target 10^5/g; absolute maximum 10^6/g

E Coli.: target 10^2/g; absolute maximum 10^3/g

Other requirements to be agreed between buyer and seller

Microbiological counts may be reduced by the use of legally permissible treatments.

4. Extraneous matter

Extraneous matter includes:

a) all matter present in the sample which is not from chillies or cap sicums of the variety under consideration;

b) all other foreign matter and, in particular, stalks, leaves, soil and sand.

Extraneous matter does not include unripe, marked or broken fruits of the variety under consideration.

The proportion of extraneous matter in whole chillies and capsicums shall not exceed 1% (m/m).

5. Unripe, marked or broken fruits

The proportion of unripe, marked or broken chillies and capsicums in whole chillies and capsicums shall not exceed 2% (m/m).

6. Chemical requirements

Whole or ground (powdered) chillies and capsicums shall comply with the requirements given below:

Chemical composition of whole chillies, chillie powder and cayenne

Parameter	Requirement
Total ash % (m/m) (on dry basis) max.	10.0 (whole) 10.5 (ground)
Acid-insoluble ash % (m/m) (on dry basis) max.	2.0 (whole) 2.5 (ground)
Moisture content % (m/m) max.	13.0 (whole) 11.0 (ground)

In addition, the proportion of ground (powdered) chillies or capsicums that passes through a sieve of nominal aperture size 500 µm shall not be less

than 95%.

7. Packing

Whole chillies and capsicums - Whole chillies and capsicums shall be packed in clean, sound containers made of a material which does not affect the product. Woven polypropylene sacks are widely acceptable.

Ground (powdered) chillies and capsicums - Ground (powdered) chillies and capsicums shall be packed in clean, sound, airtight, opaque containers, made of a material which does not affect the product.

For details on marking, storage and transport of containers, see Annex 4.

OLEORESIN CAPSICUM

Definition	• Oleoresin capsicum, obtained by solvent extrac tion of Capsicum annum or Capsicum frutescens.
Spice equivalent	• 1 kg of product 20% capsaicin replaces approximately 48-50 kg of good grade ground capsicum.
Capsaicin content	• 1 to 20% (UV spectrophotometric method)
Colour value	• 4,000 to 10,000 ASTA units
Residual solvent	• < 20 ppm
Appearance and odour	• A clear red to reddish brown viscous liquid. Powerful characteristic odour of freshly ground cap sicum and a very high bite. 1% capsicum is equiva lent to approximately 150,000 Scoville Units.

CORIANDER SEED (whole or ground)

1. Description

Coriander is the dried mature fruit of *Coriandrum sativum*. The colour of the fruit should be yellowish brown to light brown and the shape should generally be spherical to elliptical, measuring about 2 mm to 6 mm in diameter.

2. Odour and flavour

Coriander, either whole or ground (powdered), has a typical fragrant and aromatic flavour characteristic of the spice. It shall be free from mustiness and all foreign flavour.

Note 1. The characteristic flavour (odour and taste) becomes very much stronger when coriander is cracked or ground.

Note 2. Coriander seeds have a mild but very distinctive warm and fragrant odour, characteristic of the plant. The flavour is initially sweet and fruity (slightly reminiscent of oranges) with a more pungent aftertaste on chewing.

3. Freedom from insects, moulds, etc

Coriander, whole or ground (powdered), shall be free from living insects, and shall be practically free from moulds, dead insects, insect fragments and rodent contamination visible to the naked eye (corrected, if necessary, for abnormal vision). Minimum ASTA cleanliness specifications are shown in Table 13.

4. Extraneous matter

For the purpose of this standard, all materials other than the coriander seeds and all other matter of animal, vegetable or mineral origin shall be considered as extraneous matter. The total percentage of extraneous matter in whole coriander shall not exceed the values specified in the table below. Ground (powdered) coriander shall not contain added colouring matter, bleach or preservatives.

Requirements for coriander

Characteristic	Requirement			
	Whole			Ground
	Grade 1	Grade 2	Grade 3	
Extraneous matter, % (m/m), max.	1.5	2	4	-
Split fruits, % (m/m), max.	5	10	10	-
Damaged, discoloured fruits, etc. % (m/m), max.	2	3	7	-
Volatile oils, % (ml/100g), on dry basis, min.				
group A		0.6		0.6
group B		0.1		0.1

Characteristic	Requirement			
	Whole			Ground
	Grade 1	Grade 2	Grade 3	
group C		0.4		0.4
Moisture content, % (m/m), max.	9	9	9	9
Total ash, % (m/m), on dry basis, max.	-	-	-	7
Acid-insoluble ash, % (m/m) on dry basis, max.	-	-	-	1.5

5. Packing

Whole or ground (powdered) coriander shall be packed in clean and sound containers made of a material which does not affect the product but which protects it from the ingress or loss of moisture and volatile matter.

OIL OF CORIANDER

Definition
- Oil of coriander: The oil obtained by steam distillation from the fruits of Coriandrum sativum.

Appearance and colour
- Clear, mobile liquid, almost colourless to pale yellow.

Odour
- Characteristic, spicy, characteristic of coriander seeds, recalling that of linalol.

Relative density at 20/20°C
- Minimum: 0.862
  Maximum: 0.878

Refractive index at 20°C
- Minimum: 1.462
  Maximum: 1.470

Optical rotation at 20°C
- Range from + 5° to + 13°

Miscibility with 65% (*V/V*) ethanol at 20°
- The miscibility with 65% (*V/V*) shall Cbe eight volumes in one volume of essen Ctial oil to give a clear solution. No turbidity or opalescence shall appear on the further addition of the solvent.

Acid value
- Maximum: 3.0

Packing
- Preferably aluminium or glass containers (40 kg carboy).

Storage
- Store in full, tight containers, in a cool place protected from light.

GINGER (*Zingiber officinale*) (whole or ground)

1. Definition

Dried ginger, whether whole, in pieces or sliced, processed for food use and derived from the rhizomes of one or more of the subspecies of the species *Zingiber officinale*.

Whole ginger

This is the dried rhizome of the plant, known as 'ginger root'. The irregularly shaped rhizomes are tough, fibrous and may be peeled, split or sliced dependent on origin and grade. The colour is from dark grey/brown to pale cream depending on origin and processing.

Note: Lighter coloured ginger is traditionally more highly prized and gives a lighter aromatic (lemony) and less fiery flavour. Darker gingers give more heat, which is of value in food processing.

Ground ginger

The colour of ground ginger varies from mid-brown to pale yellow dependent on origin and initial processing, e.g. peeling. A major proportion of the ground ginger now traded is blended from two or more origins to combine the characteristics mentioned above in the most appropriate way for final use.

2. Odour and flavour

Ginger in root form has relatively little aroma, but that which is present should be characteristic, clean and warm. The ginger shall be free from mustiness and other foreign odour and taste when examined by sensory analysis.

The flavour is enhanced on breaking the root, dependent on origin/subspecies. The flavour is warm and lemony, through to hot and spicy. Ground ginger has these characteristics but at a higher level.

3. Freedom from insects, moulds, etc

The ginger shall be free from living insects and mould growth when inspected visually. It should be free in practical terms from dead insect fragments and rodent contamination visible to the naked eye (corrected if necessary for abnormal vision). Minimum ASTA cleanliness specifications are given in Table 13.

Microbiological details

Generally these are specified when the material is required for further processing. Indicative limits are:

Salmonella absent in (at least) 25g

Yeast and moulds: target 10^5/g; absolute maximum 10^6/g

E Coli.: target 10^2/g; absolute maximum 10^3/g

Other requirements to be agreed between buyer and seller

Microbiological counts may be reduced by the use of legally permissible treatments.

Infestation

Whole ginger should be inspected for worm holes, which arise in the root during growth. If worm holes are detected, the ginger should be fumigated. Neither whole nor ground dried ginger is prone to infestation. In cases of infestation, fumigations with subsequent cleaning or sifting if necessary are efficient.

4. Extraneous matter

The content of any foreign matter in whole ginger shall be not greater than 0.25 (m/m). The content of small roots longer than 10 mm or greater than 3 mm in diameter in whole ginger shall be not greater than 0.5 % (m/m). Ground ginger shall be free from visible extraneous matter when inspected visually.

5. Chemical composition

The chemical composition shall comply with the requirements specified below.

Chemical composition of ginger, whole and in pieces

Parameter	Requirement
Total ash % (m/m) (on dry basis) max.	8.0
Acid-insoluble ash % (m/m) (on dry basis)max.	2.5
Moisture % (m/m) max.	12.0
Volatile oil mL/100 g (on dry basis) min.	1.5

Chemical composition of ground ginger	
Parameter	**Requirement**
Total ash % (m/m) (on dry basis) max.	8.0
Acid-insoluble ash % (m/m), (on dry basis) max.	2.5
Moisture % (m/m) max	12.0
Volatile oil ml/100 g (on dry basis) min.	1.0
NOTE. A high acid-insoluble ash may give an indication of an abnormal extraneous matter content.	

Trace metals

Levels of lead and arsenic in herbs and spices are currently controlled by national legislation.

Trace metal in ginger	Maximum level mg/kg
Arsenic	5
Lead	10
Copper	20
Zinc	50
NOTE. Statutory Instruments are subject to amendment and reference should be made to those currently in force.	

6. Packaging and storage

To avoid condensation, a container that is permeable to air shall be used for packing and storing bulk material. Woven polyproplene bags are preferred.

OIL OF GINGER

Definition	• Oil obtained from steam distillation of the dried coarse ground rhizome of Zingiber officinale.
Colour and appearance.	• Light yellow to yellow Specific gravity at 25°/25°.0.871 to 0.882
Odour	• Characteristic, warm, spicy aroma.
Optical rotation	• - 28° to - 45°
Refractive index at 20°C	• 1.4880 to 1.4940
Stability	• Alkali: Relatively stable in weak alkali. Unstable in the presence of strong alkali. Acids: Unstable in the presence of strong acids.
Solubility	• Ethanol: Soluble, usually with turbidity.
Packing	• Should be shipped in glass or aluminium containers.
Storage	• Store preferably in tight, full containers in a cool place protected from light.

GROUND (powdered) PAPRIKA
(Capsicum annum)

1. Description

Ground paprika is derived from ground dried indehiscent many-seeded berries of Capsicum annuum cultivars. The berries differ in shape and colour but they all have relatively thin and slightly juicy pericarps. According to origin, berries are from 0.8 cm to 12 cm wide, and from 0.8 cm to 30 cm long, three-or four-lobed, and may be linear, conical or globose. Colours range from red to orange, yellow, or brown when ripe. Seeds are flat, oval from 2 mm to 5 mm in width. The majority of seeds develop on the semi-globe shaped placenta in the lower part of the fruit. Seeds vary from light yellow to yellowish brown.

Mild paprika is reddish uniform powder, the tint depending on the total natural colour content and the fineness of grinding. Increasing redness is taken to mean increasing quality. Hot paprika is brick red in colour with a brownish tinge, lower qualities showing a yellowish tinge. Ground (powdered) paprika is prepared from the pericarp and the seeds of the paprika fruit, plus small proportions of other parts of the placenta, the calyx and the stalk. This proportion should not be greater that that of the fruit itself.

2. Odour and flavour

The odour of ground (powdered) paprika shall be pleasantly aromatic; according to its quality, its taste shall be free from pungency, slightly pungent or very pungent. It should be free from off-flavours or off-odours (for example, musty, rancid or other foreign, disagreeable tastes or odours).

3. Freedom from insects, moulds, etc

Ground (powdered) paprika shall be free from living insects and moulds, and shall be practically free from dead insects, insect fragments and rodent contamination visible to the naked eye (corrected, if necessary, for abnormal vision) or with such magnifications as may be necessary in any particular case. Minimum ASTA cleanliness specifications are shown in Table 13 for whole fruits (requirements as for chillies/capsicums).

Microbiological details

Generally, these are specified when the material is required for further processing.

Indicative limits are:

Salmonella absent in (at least) 25g

Yeast and moulds: target 10^5/g; absolute maximum 10^6/g

E Coli.: target 10^2/g; absolute maximum 10^3/g

Other requirements to be agreed between buyer and seller

Microbiological counts may be reduced by the use of legally permissible treatments.

4. Extraneous matter

Extraneous matter includes: a) all vegetable matter other than fruits of paprika; b) colouring agents, oils or other products added to improve the quality or to mask defects. Ground (powdered) paprika should be free from extraneous matter; whole paprika should not contain more than 0.5% extraneous matter.

5. Chemical composition

Ground (powdered) paprika is graded according to origin, colour, degree of pungency and physical and chemical characteristics.

Physical and chemical requirements

Ground (powdered) paprika shall comply with the requirements given in the table below.

Characteristic	Requirement		
	Grade		
	I	II	III
	Free from pungency or scarcely pungent	Sweet to slightly pungent	Pungent
Degree of fineness of grinding, mm	0.50	0.60	0.60
Moisture content, % (m/m), max.	11.0	11.0	11.0
Total Ash, % (m/m) on dry basis, max.	6.5	7.5	10.0
Acid-insoluble ash, % (m/m) on dry basis, max.	0.5	0.8	1.6
Non-volatile ether extract, % (m/m) on dry basis, max.	17.0	17.0	17.0
Crude fibre content % (m/m) on dry basis, max.	25.0	25.0	30.0
Capsaicin content, mg/100 g on dry basis, max.	0 to 10*	20*	30*
Natural colouring matter, g/kg on dry basis, min.	2.5	2.0*	1.5

*Recommended values

Trace metals

Levels of lead and arsenic in herbs and spices are currently controlled by national regulations.

ESA guidelines are as follows:

Trace metal	Maximum level mg/kg
Arsenic	5
Lead	10
Copper	20
Zinc	50
Tin	200

6. Packing
Ground (powdered) paprika shall be packed in new, sound, clean, hermetically sealed containers made of a material which does not affect the colour, odour or the flavour of the product. The mass of the containers may be from 0.05 to 50 kg.

OLEORESIN PAPRIKA (Soluble)

Description • Obtained by solvent extraction of the dried ripe fruits of Capsicum annum, with subsequent removal of solvent.

Appearance • Dark somewhat viscous red liquid. Oleoresin paprika is evaluated strictly on a unit colour basis.

Capsaicin content • 2.8 to 3.0 % (spectrophotometric method)

Colour value • Variable according to client demand. Generally 40,000 to 100,000 ASTA colour units.

Dispersibility • Dispersible in water and vegetable oils.

Residual solvent • < 10 ppm

Storage • Store preferably in tight full containers in a cool place protected from light.

Packing • Preferably glass (carboys) or suitable steel lined containers.

Odour • Characteristic, mild odour.

WHITE PEPPER (*Piper nigrum*) (whole or ground)

1. Description

Whole white pepper is obtained in two ways:

- from black pepper of *Piper nigrum*, using the whole dry berry generally picked before complete ripening and removing the outer pericarp, with or without preliminary soaking in water.

- from the whole ripe berry of *Piper nigrum*, removing the outer pericarp by the same procedure.

Berries of white pepper are almost spherical grains of diameter 3 mm to 5 mm. The colour of white pepper varies from matt grey-brownish to pale ivory white. Ground white pepper is obtained by grinding whole white pepper, without any added matter.

2. Odour and flavour

The flavour of white pepper when it is ground shall be characteristic, slightly sharp and very aromatic. The product shall be free from extraneous odours and flavours, including mouldy and rancid odours.

3. Freedom from insects, moulds, etc

White pepper shall be free from mould and living insects and practically free from dead insects, insect fragments and rodent contamination visible to the naked eye (corrected, if necessary, for abnormal vision). Minimum cleanliness specifications are shown in Table 13.

Microbiological details

Generally, these are specified when the material is required for further processing. Indicative limits are:

Salmonella absent in (at least) 25g

Yeast and moulds: target 10^5/g; absolute maximum 10^6/g

E Coli.: target 10^2/g; absolute maximum 10^3/g

Other requirements to be agreed between buyer and seller

Microbiological counts may be reduced by the use of legally permissible treatments.

Infestation

Pepper can be subject to certain infestations. Fumigation is recommended for affected material with subsequent sifting.

4. Extraneous matter

Whole white pepper shall meet the requirements given in the table below.

Characteristic	Requirements	
	Pepper SP	Pepper P
Extraneous matter, % (m/m) max.	1.0	0.8
Light berries, % (m/m) max.	4.0	3.0
Pineheads or broken berries, (m/m) max.	15	10
Bulk density, g/l, min.	600	600

5. Chemical characteristics - See table below.

Chemical composition of whole pepper	
Parameter	**White**
Total ash % (m/m) (on dry basis) max	4.0
Acid-insoluble ash % (m/m) (on dry basis) max.	0.3
Moisture % (m/m) max.	15.0
Volatile oil ml/100g (on dry basis) min.	1.5
Piperine % (m/m) (on dry basis) min.	4.0

Chemical Composition of ground pepper	
Parameter	**White**
Total ash % (m/m) (on dry basis) max.	4.0
Acid-insoluble ash % (m/m) (on dry basis) max.	0.3
Moisture % (m/m) max.	15.0
Volatile oil ml/100g (on dry basis) min.	0.5
Piperine % (m/m) (on dry basis) min.	4.0

Trace metals
Levels of lead, arsenic and tin in herbs and spices are currently controlled by national legislation. ESA guidelines are as follows:

Levels for trace metals in pepper	
Trace metal	Maximum level MG/KG
Arsenic	5
Lead	10
Copper	20
Zinc	50
Tin	200

6. Packing
Whole white pepper and ground white pepper shall be packed in clean, sound, dry packages, made of a material which does not affect the product. Woven polypropylene bags are widely accepted.

BLACK PEPPER (*Piper nigurm*) (whole or ground)

1. Description

Whole black pepper is the whole dry berry of *Piper nigrum*, generally picked before complete ripening. Berries of black pepper have a diameter of 3 mm to 6 mm and are of a brown, grey or black colour with a wrinkled pericarp. Ground black pepper is obtained by grinding whole berries, without any added matter.

2. Odour and flavour

The flavour of black pepper when it is ground shall be characteristic, strongly sharp and very aromatic. The product shall be free from extraneous odours and flavours, including mouldy and rancid odours.

> **Note:** The appearance of berries has no direct relation to their flavour. Small berries can be more aromatic than berries of better appearance or larger size.

3. Freedom from insects, moulds, etc

Black pepper shall be free from mould and living insects and practically free from dead insects, insect fragments and rodent contamination visible to the naked eye (corrected, if necessary, for abnormal vision) or with magnification if necessary in specific cases. Minimum ASTA cleanliness specifications are shown in Table 13.

Microbiological details

Generally, these are specified when the material is required for further processing. Indicative limits are:

Salmonella absent in (at least) 25g

Yeast and moulds: target 10^5/g; absoulte maximum 10^6/g

E Coli.: target 10^2/g; absolute maximum 10^3/g

Other requirements to be agreed between buyer and seller

Microbiological counts may be reduced by the use of legally permissable treatments.

Infestation

Pepper can be subject to certain infestations. Fumigation is recommended for affected material with subsequent sifting.

4. Extraneous matter

Whole black pepper shall meet the requirements given in the table below:

Characteristic	Requirements	
	Pepper NP or SP	Pepper P
Extraneous matter, % (m/m) max.	2.5	1.5
Light berries, % (m/m) max.	11	5.0
Pineheads or broken berries, (m/m) max.	7.0	4.0
Bulk density, g/l, min.	450	49

5. Chemical characteristics - See table below.

Chemical composition of whole pepper	
Parameter	**Black**
Total ash % (m/m) (on dry basis) max	7.0
Acid-insoluble ash % (m/m) (on dry basis) max.	1.7
Moisture % (m/m) max.	15.0
Volatile oil ml/100g (on dry basis) min.	2.0
Piperine % (m/m) (on dry basis) min.	3.5

Chemical Composition of ground pepper	
Parameter	**Black**
Total ash % (m/m) (on dry basis) max.	7.0
Acid-insoluble ash % (m/m) (on dry basis) max.	1.7
Moisture % (m/m) max.	15.0
Volatile oil ml/100g (on dry basis) min.	1.0
Piperine % (m/m) (on dry basis) min.	3.5

Trace metals
Levels of lead, arsenic and tin in herbs and spices are currently controlled by national legislation. ESA guidelines are as follows:

Trace metal	Maximum level MG/KG
Arsenic	5
Lead	10
Copper	20
Zinc	50
Tin	200

Note: Statutory Instruments are subject to amendment and reference should be made to those currently in force

6. Packing

Whole black pepper and ground black pepper shall be packed in clean, sound, dry packages, made of a material which does not affect the product.

OLEORESIN BLACK PEPPER (Soluble)

Definition
- Obtained by solvent extraction of the dried unripe berries of Piper nigrum, with subsequent removal of solvent.

Appearance and odour
- Homogeneous, dark green, olive green, pourable emulsion with the characteristic aroma of black pepper.

Piperine content
- 12 to 13% (UV spectrophotmetric method)

Volatile oil
- 3% to 4%

Dispersibility
- Dispersible in water and vegetable oils.

Spice equivalent
- One part of oleoresin can replace six to eight parts of freshly ground pepper.

Residual solvent
- < 10 ppm

Storage
- Store preferably in tight full containers in a cool place protected from light.

Packing
- Preferably glass (carboys) or suitable steel lined drums.

Note: Decolourised pepper oleoresin can be obtained by the partial removal of chlorophyll.

OLEORESIN BLACK PEPPER

Definition	• Obtained by solvent extraction of the dried unripe berries of Piper nigrum.
Appearance and odour	• The viscous oleoresin is olive-green to olive-brown in colour with aroma and taste characteristic of black pepper.
Piperine content	• 40 to 42% (UV spectrophotmetric method)
Volatile oil	• 20 to 28 ml/100g
Spice equivalent	• 4 to 5 kg of oleoresin replace 100 kg of black pepper
Residual solvent	• < 10 ppm
Storage	• Store preferably in tight full containers in a cool place protected from light.
Packing	• Pail, glass (carboys) or suitable steel lined drums.

OIL OF BLACK PEPPER

Definition Oil of black pepper	• The oil obtained by steam distillation of the whole or broken unripe fruits of Piper nigrum.
Appearance and colour	• Clear, mobile liquid. Almost colourless to bluish-green.
Odour and taste	• Characteristic, recalling that of whole pepper. Mild, lacking the pungency of the spice.
Relative density at 20/20°C	• Minimum: 0.870, Maximum: 0.890
Refractive index at 20°C	• Minimum: 1.480, Maximum: 1.492
Optical rotation at 20°C	• Range from - 16° to + 4°
Miscibility with 95 % (*V/V*) ethanol at 20°C	• The miscibility with 95% (*V/V*) at 20°C ethanol shall be 1 volume in 3 volumes to give a clear solution.
Ester value	• Maximum: 11
Packing	• Aluminium or glass (40 kg carboy).
Storage	• Store in full, tight containers protected from light.

SAFFRON

1. Description

Saffron in filaments: Stimgas of Crocus sativus, dried, dark in red colour and rolled into cornets, serrated or indented at the distal end. The stigmas may be either isolated or joined in twos or threes at the end of a portion of the style (which is also red in colour).

Yellow filaments: Dried yellow stigmas of flowers of Crocus sativus.

Floral waste: Yellow filaments, pollen, stamens, parts of ovary and other parts of the flower of Crocus sativus.

Extraneous matter: Leaves, stems, chaff and other vegetable matter. The only mineral matter permitted is sand, earth and dust.

Saffron in whole filaments is classified into three categories, as shown below.

Classification of saffron in whole filaments.

Characteristics	Category 1 type "Mancha"	Category II type "Rio"	Category III type "Sierra"
Floral waste % (m/m) max.	7	13 to 15	17 to 20
Extraneous matter % (m/m) max.	0.5	1	1

2. Flavour

The flavour of saffron shall be specific, slightly bitter and a little pungent. The product shall be free from foreign flavours.

3. Freedom from insects, moulds, etc

Saffron shall be free from living insects, and shall be practically free from moulds, dead insects, insect fragments and rodent contamination visible to the naked eye (adjusted if necessary for abnormal vision) using the required magnifying instrument in each particular case.

4. Chemical requirements

Saffron in filaments or in powder form shall comply with the requirements laid down in the following table.

Chemical requirements for saffron in filaments or in powder form.

Characteristics	Requirements	
	Saffron in filaments	Saffron in powder form
Water and volatile matter at 103°C, % (m/m) max.	14	8
total ash, % (m/m), on the dry basis:		
max.	8	8
min.	5	5
Ash insoluble in HC1, % (m/m) on the dry basis:		
Category I, max.	1.0	1.0
Categories II and III, max.	1.5	1.5
Extract soluble in cold water, % (m/m), on the dry basis:		
max.	65	65
min.	55	55
Total nitrogen, % (m/m), on the dry basis:		
max.	3.0	3.0
min.	2.0	2.0

5. Packing

Saffron in filaments and in powder form shall be packed in rigid, water-tight, sound and clean containers which shall be of a material that can have no influence on the saffron.

TURMERIC (*Curcuma longa*) (whole or ground)

1. Definition

Dried turmeric, whole or ground (powdered), processed for food use and derived from the cured and dried primary or secondary rhizomes, called commercially bulbs or fingers, of the perennial tropical plant *Curcuma longa*.

Whole turmeric

Whole turmeric is the cured (boiled) primary or secondary rhizomes of *curcuma longa* which are sun-dried and polished after curing. Polishing is carried out by tumbling the rhizomes together in drums after drying. Whole turmeric is graded according to its type, fingers or bulbs, which have appropriate use, and is screened to remove dust and small pieces. A common grading is < 5 % (m/m) of rhizomes under 15 mm in length. Bulbs tend to give a lighter colour than fingers. The size, shape and colour are characterised by the type, sub-species and country of origin. Turmeric for colouring uses is not polished.

The fingers should be hard and brittle and break with a crack.

Ground tumeric

Ground tumeric is produced by grinding whole turmeric with no additions. The colour of the ground material is pale yellow to orange-brown dependent on regional origins within a country or the country or origin. It has dye-like properties and is bleached by direct light.

Origins

Commonly traded origins of turmeric are India, China, Bangladesh, Jamaica, Nepal, Haiti and Peru (in approximate order of darkening yellowness of the ground material).

2. Odour and flavour

Turmeric shall be free from mustiness, rancidity and other foreign odours and tastes when examined by sensory analysis. Whole or ground turmeric shall have the characteristic odour of the spice which is warm, aromatic and earthy, but not musty. The flavour is mild, warm, sweet, and slightly earthy. The ground spice has more flavour and an intense yellow colour which easily colours other materials.

3. Freedom from insects, moulds, etc

Whole tumeric shall be free from living insects and mould growth when inspected visually.

Note: It should be free in practical terms from dead insects, insect fragments and rodent contamination visible to the naked eye (corrected if necessary for abnormal vision). Minimum ASTA cleanliness specifications are shown in Table 13.

Microbiological details

Generally these are specified when the material is required for further processing. Microbiological counts may be reduced by the use of legally permissible treatments.

Salmonella abs. in (at least) 25g

Yeast and moulds: target 10^5/g; absolute maximum 106/g

E Coli.: target 10^2/g; absolute maximum 10^3/g

Other requirements to be agreed between buyer and seller

Infestation

Turmeric may be affected by worms when the holes are evident. In cases of infestation, fumigation may be effective with subsequent kibbling and sifting prior to grinding.

4. Extraneous matter

Whole turmeric

The content of any extraneous and foreign matter in whole turmeric shall not be greater than 0.5 % (m/m). Note: Foreign matter found in whole turmeric includes chaff, dried leaves, soil, stones.

Whole turmeric shall not contain greater than 3 % (m/m) defective turmeric fingers. Note: The following should be considered as defective turmeric fingers: worm-eaten fingers; hollow fingers caused by insect attack; shrivelled fingers due to poor rhizome development; Scorched fingers due to boiling at the curing stage.

Ground turmeric

Ground turmeric shall be free from visible extraneous matter. Note: An abnormal extraneous foreign matter content in ground turmeric may be indicated by a high acid-insoluble ash. However, ground turmeric has also in the past been commonly adulterated with starch (which would lower the acid-insoluble ash).

5. Chemical composition

The chemical composition of whole and ground turmeric shall conform to the requirements specified in the table below.

Chemical composition of dried turmeric, whole and ground	
Parameter	**Requirement**
Total ash % (m/m) (on dry basis) max.	8.0
Acid-insoluble ash % (m/m) (on dry basis) max	2.0 (whole) 2.5 (ground)
Moisture % (m/m) max.	12.0
Volatile oil ml/100 g (on dry basis) min.	2.5 (whole) 1.5 (ground)

Particle size (mesh)

For ground material, particle size is generally quoted as the percentage by mass of material that passes through a test sieve. Turmeric is usually finely ground, to maximise its colouring effect. However, mesh sizes from as coarse as 30 mesh (500 µm) to 150 mesh (100 µm) are sometimes specified.

Colour

This may be visual or extracted and specifications may be set for either on the ground product.

Visual: Turmerics are blended to match a visual colour standard.

Extracted: This is a measurement of the colouring power of turmeric by measurement of the curcumin(oid) content. Darker origins usually have higher curcumin contents.

6. Packaging

To avoid condensation, a container that is permeable to air shall be used for packing and storing bulk rhizomes. Woven polypropylene bags are widely used.

Ground material should be packed in new, sound, clean, hemetically sealed containers made of a material that does not affect the colour, odour or the flavour of the product.

OLEORESIN TURMERIC (INSOLUBLE)

Description	• Obtained by solvent extraction of the dried rhizomes of *Curcuma longa*, with subsequent removal of solvent. Oleoresin turmeric is evaluated strictly on colour value.
Appearance	• A viscous, yellowish to orange red pourable emulsion.
Curcumin content	• Varies from 35% to 45%
Colour value	• 5,000 to 14,000 units (EOA Method 271)
Odour	• Characteristic turmeric odour with an underlying nut like character and bitter after taste.
Spice equivalent	• One part of oleoresin with 35% curcumin can replace 15 to 16 parts of freshly ground turmeric powder
Residual solvent	• < 30 ppm
Storage	• Storage preferably in full tight containers in a cool place, protected from light.
Additives	• Only pure extract of turmeric.

OLEORESIN TURMERIC (SOLUBLE)

Description	• Obtained by solvent extraction of the dried rhizomes of *Curcuma longa*, with subsequent removal of solvent.
Appearance and odour	• Homogeneous, yellowish to orange red pourable emulsion with mild aroma of turmeric.
Dispersal	• Dispersible in water and vegetable oils.
Curcumin content	• Varies: approximately 5 to 10% curcumin (UV spectrophotometric method).
Spice equivalent	• One part of oleoresin with 8% curcumin can replace three to five parts of freshly ground turmeric powder.
Residual solvent	• < 20 ppm
Storage	• Storage preferably in full tight containers in a cool place, protected from light.
Volatile oil content	• Varies from 8.0 to 8.5% (UV spectrophotometric method)
Packing	• preferably glass (carboys) or suitable steel lined containers.

VANILLA (*Vanilla fragrans*)

1. Description

Vanilla belonging to the species *Vanilla fragrans* syn. *Vanilla planifolia* and for certain forms of vanilla obtained from seeds, which may be hybrids of *Vanilla fragrans.*

Four commercial forms are known:

a) **vanilla pods,** consisting of whole pods which may be split;

b) **cut vanilla,** consisting of parts of pods, split or not, and deliberately cut or broken;

c) **vanilla in bulk,** consisting of vanilla in pods and cut vanilla;

d) **vanilla powder,** obtained by grinding vanilla pods without additives after drying.

General characteristics

Vanilla pods

Vanilla pods shall:

a) have the characteristics corresponding to their qualitative category.

b) have undergone a suitable treatment with a view to developing their flavour.

c) have a maximum moisture content conforming to that of their qualitative category.

The pods may be rimy, and may have a mark at the bottom one-third of their length.

They shall not:

a) have undergone any treatment which would induce a change in their natural vanillin content or in the content of any other constituent of the flavour;

b) be moth-eaten, mouldy, creosoted, "poiquees" (blistered), oxidized;

c) have an odour which is not typical of vanilla.

Cut vanilla

Cut vanilla shall:

a) be prepared from vanilla pods meeting the requirements specified:

b) be sound and of good specific flavour;

c) have a maximum moisture content of 30%;

d) be chocolate brown to dark brown in colour.

Vanilla in bulk

Vanilla in bulk shall:

a) be obtained from vanilla pods meeting the requirements specified in the General Characteristics, or from pieces of pods meeting the requirements specified;

b) be of sound and specific flavour;

c) have a maximum moisture content of 30%;

d) be chocolate brown to dark brown in colour.

Pods or pieces are generally wooded, and may have several large stains.

Vanilla powder

Vanilla powder shall:

a) be obtained from vanilla pods, cut vanilla or vanilla in bulk, outlined in the respective general characteristics.

b) have a maximum moisture content of 20%;

c) be sufficiently fine to pass through a sieve of aperture size 1.25 mm;

d) be brown or dark brown in colour;

e) have the natural and very marked flavour of vanilla.

It shall not have:

a) undergone any treatment which could induce a change in its natural vanillin content or in the content of any other constituents of the flavour;

b) contain any extraneous matter;

c) have a musty, creosote or any other odour which is not typical of vanilla.

2. Qualitative classification of vanilla pods

Category 1: A_1 Non-split

Pods which are whole, sound, supple and full, of typical flavour, of uniform chocolate brown to dark brown colour, and without any other stain than the mark. Maximum moisture content: 38%.

B_1 Split

Pods of the same characteristics as those of category A_1, but split.

Category 2: A_2 Non-split

Pods which are whole, sound, supple and full, or typical flavour, of uniform chocolate brown to dark brown colour, and which may have a few stains, the total length of which does not exceed one-third of the length of the pod. Maximum moisture content: 38%.

B_2 Split

Pods of the same characteristics as those of category A_2, but split.

Category 3: A_3 Non-split

Pods which are whole, sound, more or less supple, of typical flavour, chocolate brown to dark brown in colour, and which may have numerous stains the total length of which does not exceed half the length of the pod, as well as a few red filaments which do not exceed one-third of the length of the pod. Maximum moisture content: 30%.

B_3 Split

Pods of the same characteristics as those of the category A_3, but split.

A_4 Non-split Category 4:

Pods which are whole, sound, dry or wooded, of typical flavour, reddish in colour and which may have several stains the total length of which does not exceed half the length of the pod. Maximum moisture content: 25%.

B_4 Split

Pods of the same characteristics as those of category A_4, but split.

3. Freedom from insects, moulds, etc

Vanilla shall be free from insects and moulds, living or dead, when inspected visually. It should be free in pratical terms from insect fragments and rodent contamination visible to the naked eye (corrected if necessary for abnormal vision).

Where moulds develop in cured vanilla during storage, the mouldy beans should be removed, cleaned, re-dried, and then rebundled. In severe cases the mouldy part should be cut off and discarded.

Infestation

Infestations of mites may occur on poor quality and poorly cured vanilla during storage. All beans should be removed from the container, damaged beans or parts of beans should be removed and discarded, the box should be fumigated or scorched with a flame, wrapping materials burnt, and the sound beans heated in an oven at 65^{o}C to 70^{o}C for 10 minutes.

4. Extraneous matter

Vanilla should be free from any extraneous matter.

5. Packing

Vanilla pods

Vanilla pods shall be in packets (bundles) of pods of the same length, and

shall be put in clean, sound watertight containers of a material that will have no effect on the product (for example, tin-plate or wooden boxes lined with waxed paper, or cardboard boxes lined with plastic etc).

The contents of each of these containers shall be uniform from the point of view of category (grade) of vanilla.

A series of these elementary containers, the contents of which are homogenous, constitutes a lot; a consignment is constituted either by a homogenous lot or by several lots belonging to different categories.

Cut vanilla

Cut vanilla shall be put in packets of pods of the same length when they are sufficiently long, and in bulk when they cannot be put in bundles.

They shall then be placed in clean, sound and watertight containers of a material that will have no effect on the product.

Cut vanilla shall be uniform from the botanical point of view

Vanilla in bulk

Vanilla in bulk shall be put in clean, sound and watertight containers of a material that will have no effect on the product.

Vanilla Powder

Vanilla powder shall be put in clean, sound and watertight containers of a material which will have no effect on the product.

ANNEX 1

Names of Major Spices Traded

English	French	German	Latin (Botanic Name)
Allspice	Piment	Piment	*Pimenta officinalis*
Anise Seed	Anis	Anis	*Pimpinella anisum*
Cassia	Cochinchine	Cassia	*Cinnamomum burmannii*
Cinnamon	Canelle	Zimt	*Cinnamomum ceylanicum*
Chillies	Poirve Rouge	Chilli	*Capsicum frutescens*
Coriander	Coriandre	Koriander	*Coriandrum sativum*
Cardamom	Cardamome	Cardamom	*Elettaria cardamomum*
Caraway	Carvi	Kümmel	*Carum carvi*
Clove	Girofle	Nelken	*Caryophyllus aromaticus*
Garlic	Ail	Knoblauch	*Allium sativum*
Ginger	Gingembre	Ingwer	*Zingiber officinale*
Mace	Macis	Muskatblüte	*Myristica fragrans*
Nutmeg	Muscade	Muskatnuß	*Myristica argentea*
Paprika	Poivre de Guinée	Paprika	*Capsicum annuum*
Pepper	Poivre	Pfeffer	*Piper nigrum*
Saffron	Safran	Safran	*Crocus sativus*
Turmeric	Curcuma	Kurkuma	*Curcuma longa*
Thyme	Thym	Thymian	*Thymus vulgaris*
Vanilla	Vanille	Vanille	*Vanilla planifolia*

ANNEX 2

PREFERENTIAL TRADE GROUPINGS FOR CUSTOMS TARIFFS

The EC has a number of preferential trade agreements with certain individual countries or groups of countries outside the EC. All of the developing countries belong to one or more of these groups, and are, as such, entitled to reduced and frequently zero tariffs on imports of spices (see Table 12 for duty rates as of January 1996).

The list below shows the eligibility for the principal preferential trade groups (ACP, LDDC) for Commonwealth and other countries. In order to benefit from the reduced customs tariffs from the above trade groups, the exporter must obtain and complete either a EUR 1 form from the ACP group, or an "A" form for the GSP and LDDC groups. These forms can be obtained from the Ministry of Trade or the Chamber of Commerce in the exporting country. Alternatively, the importer should be able to offer assistance in acquiring them.

ACP: African, Caribbean and Pacific Group.

GSP: Generalised System of Preferences Group.

LDDC: Least Developed Developing Countries Group.

ANNEX 2

List of the Tariff Status of Commonwealth and Major Horticultural Exporting Countries from the Developing World

Country	ACP	GSP	LDDC	Country	ACP	GSP	LDDC
Algeria		•		Congo	•	•	
Angola	•	•		Costa Rica		•	
Antigua and				Cuba		•	
Barbuda		•		Cyprus		•	
Argentina		•		Dominican			
Bahamas	•	•		Republic		•	•
Bangladesh		•	•	Dominica	•		
Barbados	•	•		Egypt		•	
Belize	•	•		Ethiopia	•	•	•
Bhutan	•	•		Fiji	•	•	
Botswana	•	•	•	Gabon	•	•	
Brazil		•		Gambia	•		
Cameroon	•	•		Ghana	•	•	
China		•		Grenada		•	•
Colombia		•		Guatemala		•	
Guinea	•	•		Samoa			
Guinea Bissau	•	•	•	Western	•	•	•
Guyana	•	•		St Kitts	•		
Haiti		•	•	St Lucia		•	
Honduras		•		St Vincent	•		
Hong Kong	•			Senegal	•	•	
India		•		Seychelles	•		
Indonesia		•		Sierra Leone	•	•	•
Ivory Coast	•	•		Singapore		•	
Jamaica	•	•		Solomon			
Kenya	•	•		Islands	•	•	
Kiribati	•	•		Somalia		•	
Lesotho	•	•	•	Sri Lanka		•	
Madagascar	•			Sudan	•	•	•
Malawi	•	•	•	Surinam		•	•
Malaysia		•		Swaziland	•	•	
Mali	•			Tanzania	•	•	•
Mauritius	•	•		Thailand			•
Mexico		•		Togo	•	•	•
Morocco		•		Tonga	•	•	•
Mozambique	•	•		Trinidad/			
Nicaragua		•		Tobago	•	•	
Nigeria	•	•		Tuvalu	•		
Papua New				Uganda	•		
Guinea	•	•		Zaire	•	•	
Peru		•		Zambia	•	•	
Rwanda		•		Zimbabwe	•	•	

Useful Addresses

* Key Companies in the sector are shown with thick rule before and after entry.

BELGIUM

Caldic Food N.V.,
Terlochtweg 1
B-2620 Hemiksem
(Antwerp)

Tel: (32) 3-8704911
Fax: (32) 3-8804919

Comité Européen de Normalisation (CEN)
Standards
Strassant 36
B-1050 Brussels

Tel:(32) 2 5196811
Fax:(32) 2 5196819

ETS.A. Dewitte & Fils SA
Rue Leon Delacroix, 30
B-1070 Brussels

Tel: (32) 2-410-6255
Fax: (32) 2-410-1569

Federation des Industries Condimentaires de Belgique
Trade Association
Ave de Cortenbergh 12
B-1040 Brussels

Tel:(32) 2 7358170
Fax:(32) 2 7368175

Institut Belge de Normalisation (IBN)
Standards
Avenue de la
Brabançonnelaan 29
B-1040 Brussels

Tel:(32) 2 7349205
Fax:(32) 2 7334264

DENMARK

Danske Krydderier-Carno
Midtager-28
2600 Glostrup

Tel: (45) 43-96-7900
Fax: (45) 43-43-3243

Dirach Ltd
Po Box 65
4000 Roskilde

Tel: (45) 42-35-9211
Fax:(45) 42-35-7750

Nordle Food A/S.,
Po Box 117
Huginsvej 15,
DK4100 Ringsted

Tel: (45) 536-17800
Fax: (45) 536-70488

Scandeco/Danish Spices Association
Trade Association
Lofasvej 204
Freeport
DK-2100 Copenhagen

Tel:(45) 35 261904
Fax: (45) 35 262904

Scanspice
Ulrikkenborg PL 10B
DK 2800 Lyngby

Tel: (45) 930-333
Fax: (45) 872-062

FRANCE

Amora S.A.
48 Quai Nicolas Rolin
B.P. No 670
21017 Dijon Cedex

Tel:(33) 80 44 44 44
Fax:(33) 80 44 44 50

Arco Ocean Indien
61 Avenue de la
Libération
0613 Grasse

Tel:(33) 93 42 41 00
Fax:(33) 93 40 47 79

Association Française de Normalisation (AFNOR)
Standards
Tour Europe - Cedex 7
F-92049 Paris
La Défense

Tel:(33) 1 42915819
Fax:(33) 1 42915656

COLEACP
Trade Promotion
5 Rue de la Corderie
Centra 342
94586 Rungis Cedex

Tel:(33) 1 46 870206
Fax:(33) 1 46 863315

Epices Fuchs
BP 312 - 67088
Strasbourg Cedex 2

Tel: (33) 88 56 99 88
Fax: (33) 88 56 11 49

Mane Fils (S.A.)
06620 BAR-sur-LOUP

Tel: (33) 93-09-70-00
Fax: (33) 93-42-54-25

Robertet S.A.
37 avenue Sidi Brahim
06333 GRASSE CEDEX

Tel: (33) 93-40-33-66
Fax: (33) 93-70-68-09

Sté. Daregal
6 Bd. Joffre - BP 8
91490 Milly-La-Foret

Tel: (33) 64 98 29 00
Fax: (33) 64 98 74 57

Sanierre (Jean)
8 Rue Haxo
13001 Marseille

Tel:(33) 91 33 69 47/49
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Société Ducros
Z.I Le Terradou
84971 Carpentras
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Syndicat National des Transformateurs de Poivres, Epices, Aromates et Vanille
Trade Association
8, Rue de l'Italy
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11-13 rue Gustave Eiffel
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22923/22907
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Karl Ostmann GmbH
Friedrich-Hagemann Str 56
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Moguntia Werke
Untere Zahlbacher Str 50-58
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2000 Hamburg 50

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Fax:(49) 40 380 308 27

Raps & Co
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Wagner-Gewurze GmbH
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1773529 Schwabisch Gmund -Reitsprechts

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Catz International B.V.
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3000 AD Rotterdam

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CBI
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3001 DA Rotterdam

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Fax:(31) 10 4114081

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Huybregts Groep
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5700 AD Helmond

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Man-Producten Rotterdam B.V.

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British Pepper & Spice Co Ltd
Rhosili Road
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Fax: (44)1604-763156

British Standards Institute
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389 Chiswick High Road
London W4 4AL

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Fax:(44) 181 996 7001

Bush Boake Allen Ltd
Blackhorse Lane
Walthamstow
London E17 5QP

Tel: (44)181-531-4211
Fax: (44)181-531-7413

East Anglian Food Ingredients Ltd
Gorse Lane Ind. Estate
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420844
Fax:(44) 1255 220091

European Spice Association
Trade Association
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Fax:(44) 171 8360580

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Fax: (44)181-533-5122

Fooks & French Ltd
Thames House
18 Park Street
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Fuerst Day Lawson Ltd
St. Clare House
30/33 Minories
London EC3N 1LN

Tel: (44)171-488-0777
Fax: (44)171-488-9927

James Dalton (Seasoning & Spices Ltd)
Camwal Road
Starbeck
Harrogate
North Yorkshire
HG1 4PY

Tel:(44) 1423 885255
Fax:(44) 1423 880611

Kimpton Brothers Ltd
10-14 Hewett Street
London EC2A 3HA

Tel: (44)171-247-2072
Fax: (44)171-247-2784

Lion Foods Ltd
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Tel: (44)19285-65221
Fax: (44)19285-61122

McCormick UK plc
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Desborough Road
High Wycombe
Buckinghamshire
HP11 2HS

Tel: (44)1494-533456
Fax: (44)1494-463246

Rucker & Slann Ltd
7 Seax Way
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T.R.S. Wholesale Co. Ltd
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Loc Crocioni 43/A
I-37100 Verona
Italy

Tel:(39) 45 7150599
Fax:(39) 45 6700787

Marking, Storage and Transport of Spices for Export

Marking

Bulk containers (i.e sacks, boxes) should be marked, at a minimum, with the following information:

- name of the product and the trade name or brand name, if any;
- name and address of the producer or packer;
- date of packing;
- net mass (in kg);
- producing country;
- code or batch number;
- details of any special treatment (fumigation, irradiation etc);
- any other information requested by the purchaser.

If the product is graded, the grade should be stated.

Year of production can be stated.

A reference to the International Standard which the product meets may be added.

Retail containers must be marked to comply with the rules and regulations of the country in which the product is to be sold.

If glass containers are used, each must be marked "Fragile - Glass".

Storage and transport

The storage premises should be well protected from the sun, rain and excessive heat.

The store room should be dry, free from objectionable odours and proofed against the entry of insects and vermin. The ventilation should be controlled so as to give good ventilation under dry conditions and to be fully closed under damp conditions. In a storage warehouse, suitable facilities should be available for fumigation.

The containers should be so handled and transported that they are protected from the rain, from the sun or other source of excessive heat, from unpleasant odours and from cross-infestation, especially in the holds of ships.

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