

The Spice Market in the United States

Recent Developments and Prospects

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Introduction

Five hundred years ago, ships sailed from Europe to discover new spice trade routes to Asia. En route they discovered the Americas and for centuries spices have been flowing from Asia to the Americas. For the United States, trade in spices in the 1980's and early 1990's has been trending upward to record levels reflecting increasing demand. The growth in spice demand reflects population growth, a trend toward the use of spices to compensate for less salt and lower fat levels in food, and heightened popularity of ethnic foods from Asia and Latin America. This report assesses trends in U.S. spice trade, domestic spice production, and spice consumption. Also reviewed is the role of the American Spice Trade Association and the U.S. Government in setting standards and regulating the industry. Lastly, this report assesses the outlook for future growth and leading issues confronting the U.S. spice industry.

Spices Defined

The American Spice Trade Association (ASTA) defines spice as "any dried plant product used primarily for seasoning purposes." Included are tropical aromatics (pepper, cinnamon, cloves, etc.); leafy herbs of the temperate zone (oregano, basil, sage, etc.); spice seeds (sesame, mustard, caraway, etc.); and dehydrated vegetables used as spices (onion, garlic, chile peppers, etc.).

In terms of statistical data, there are several differences between the U.S. Department of Agriculture's (USDA) data base as published annually in the *Spice Trade Circular* and that developed by ASTA. For example, USDA combines fresh and dried ginger trade data while ASTA includes only dried ginger. USDA includes capers in its spice trade statistics; ASTA does not. Conversely, ASTA includes chervil and

chives in its spice trade statistics; USDA does not. All in all, the data are largely comparable and for purposes of this report, an effort has been made to link the two data sources, to eliminate problem data (for example, capers, candied ginger, and prepared mustard), and to focus on broad trends (text box 1).

U.S. Spice Supply

Spices As Part of U.S. Agricultural Trade

The United States is a large net importer of spices. On a volume and value basis, the United States, year to year, is consistently the world's largest spice importer. The average annual volume and value of spice and spice oleoresin imports into the United States (1990-94) was 530 million pounds and \$374 million (table 1). This compares with the preceding 5-year periods, which averaged 433 million pounds and \$372 million (1985-89), and 362 million pounds and \$225 million (1980-84) (figure 1).

Spices are a significant and growing share of total U.S. agricultural imports, representing 6.4 percent of noncompetitive imports the last 5 years (table 2). Moreover, U.S. spice imports represent a significant trade group for many countries, especially those in the Asian tropics. In import value terms, however, spices remain small compared with import values for the major tropical commodities--coffee, sugar, bananas, and cocoa. For 1994, imports of these commodities totaled \$5.72 billion, accounting for 21 percent of the total value of agricultural imports. Coffee imports lead the group with imports valued at \$2.49 billion, followed by sugar, \$1.13 billion; bananas, \$1.07 billion; and cocoa, \$1.03 billion.

Concurrently with record overall agricultural imports, the United States was exporting a record \$45.7 billion

List of spices by their common and scientific names and the part of the spice plant from which they are obtained

Common name	Part of plant ¹	Botanical name
Allspice (pimento)	Berry	<i>Pimenta officinalis</i>
Anise seed	Seed	<i>Pimpinella anisum</i>
Star anise	Fruit	<i>Illicium verum</i>
Basil leaves	Leaf	<i>Ocimum basilicum</i>
Bay leaves (laurel leaves)	Leaf	<i>Laurus nobilis/Umbellularia California</i>
Black caraway (Russian caraway, black cumin)	Seed	<i>Nigella satavia</i>
Caraway seed	Seed	<i>Carum carvi</i>
Cardamom ²	Fruit	<i>Elettaria cardamomum</i>
Cassia/Cinnamom	Bark	<i>Cinnamomum spp.</i>
Celery seed	Seed	<i>Apium graveolens</i>
Chervil	Leaf	<i>Anthriscus cerefolium</i>
Chives	Leaf	<i>Allium schoenoprasum</i>
Cilantro (Coriander leaf)	Leaf	<i>Coriandrum sativum</i>
Cinnamon/Cassia	Bark	<i>Cinnamomum spp.</i>
Cloves	Bud	<i>Syzygium aromaticum</i>
Coriander seed	Seed	<i>Coriandrum sativum</i>
Cumin seed (Comino)	Seed	<i>Cuminum cyminum</i>
Dill seed	Seed	<i>Anethum graveolens/Anethum sowa</i>
Dill weed	Leaf	<i>Anethum graveolens/Anethum sowa</i>
Fennel seed	Seed	<i>Foeniculum vulgare</i>
Fenugreek seed (Foenugreek seed)	Seed	<i>Trigonella foenum-graecum</i>
Ginger	Root	<i>Zingiber officinale</i>
Juniper	Berry	<i>Juniperus communis</i>
Mace	Aril	<i>Myristica fragrans</i>
Marjoram leaves	Leaf	<i>Majorana hortensis</i>
Mustard seed	Seed	<i>Brassica juncea/Brassica hirta</i>
Nutmeg	Seed	<i>Myristica fragrans</i>
Oregano leaves	Leaf	<i>Origanum vulgare/Lippia spp.</i>
Parsley (Dehydrated parsley, parsley flakes)	Leaf	<i>Petroselinum crispum</i>
Black pepper	Berry	<i>Piper nigrum</i>
White pepper	Berry	<i>Piper nigrum</i>
Green peppercorns	Berry	<i>Piper nigrum</i>
Pink peppercorns ³	Berry	<i>Schinus terebinthifolius</i>
Peppermint leaves (Peppermint flakes)	Leaf	<i>Mentha piperita</i>

¹ See references at end of table.

Continued--

List of spices by their common and scientific names and the part of the spice plant from which they are obtained--Continued

Common name	Part of plant ¹	Botanical name
Poppy seed	Seed	<i>Papaver somniferum</i>
Rosemary leaves	Leaf	<i>Rosmarinus officinalis</i>
Sage leaves	Leaf	<i>Salvia officinalis/Salvia triloba</i>
Savory leaves	Leaf	<i>Satureia montana/Satureia hortensis</i>
Sesame seed ⁴	Seed	<i>Sesamum indicum</i>
Spearmint leaves (Spearmint flakes)	Leaf	<i>Mentha spicata</i>
Tarragon leaves	Leaf	<i>Artemisia dracunculus</i>
Thyme leaves	Leaf	<i>Thymus vulgaris</i>
Vanilla beans	Fruit	<i>Vanilla planifolia/Vanilla tahitensis</i>

In addition there are a number of dehydrated vegetables used as spices:

Bell peppers (Green, Red, or Mixed)	Fruit	<i>Capsicum spp.</i>
Celery	Leaf/stalk	<i>Apium graveolens</i>
Garlic	Bulb	<i>Allium sativum</i>
Onion	Bulb	<i>Allium cepa</i>

There are also a select group of spices used to impart color as well as flavor:

Annatto seed	Seed	<i>Bixa orellana</i>
Paprika	Fruit	<i>Capsicum spp.</i>
Saffron	Stigma	<i>Crocus sativus</i>
Turmeric	Root	<i>Curcuma longa</i>

Also, all capsicum, whether of the spices annum or frutescens, are listed separately and not listed within the "general" spice group. They include the following:

Bell peppers (Green, Red, or Mixed)	Fruit	<i>Capsicum spp.</i>
Chile pepper ⁵	Fruit	<i>Capsicum spp.</i>
Paprika	Fruit	<i>Capsicum spp.</i>
Pepper, red (Chiles)	Fruit	<i>Capsicum spp.</i>

¹References to plant parts, berries, leaves, seeds, etc., are usually in the dried form.

²Must be small cardamom.

³Must be from Madagascar or Island of Reunion.

⁴May be listed by specific form (that is, natural or hulled).

⁵Often are listed by specific variety.

in agricultural exports led by shipments of grains and oilseeds of nearly \$21 billion, leaving an agricultural trade balance in excess of nearly \$19 billion (table 3). A significant share of these exports are marketed in Asia. This complementary trade has at its roots the economic law of "comparative advantage," which is the basis for nations to specialize in the agricultural production and trade in which their natural resources, climate, and human experience give them special advantages. This specialization tendency is very striking in the production and international commerce of spices.

Composition of the U.S. Spice Import Market

The United States imports more than 40 primary types of spices each year. Seven major types (vanilla beans, capsicums, black and white pepper, sesame seed, cinnamon and cassia, mustard, and origanum) account for more than 75 percent of the total annual value of spice imports (figure 2). Also, while more than 50 countries regularly supply the United States with spices, 5 of these countries (Indonesia, Mexico, India, Canada, and China) regularly account for one-half of the annual value of spice imports (figure 3). Three countries (India, Spain, and Morocco) regularly account for two-thirds of the value of spice oleoresin imports (figure 4).

Leading Spice Imports

The following provides an overview of the leading spice imports, in order of total value, including trends in the volume and value of trade, and their main sources of supply and uses in the U.S. market.

Vanilla beans (*Vanilla planifolia*). The United States is the world's largest market for vanilla beans. Moreover, vanilla beans rank as the leading U.S. spice import in terms of value. The trend toward natural flavoring in food products continues to keep demand for vanilla beans steady, despite strong competition from synthetic flavorings such as vanillin. Vanilla continues as the most popular ice cream flavor in the United States and accounts for nearly one-third of all ice cream sales. Ice cream is the largest use for natural vanilla, representing about one-half of the market. Legislation requiring the labeling of ice cream products to show whether real vanilla or artificial vanilla has been used has also aided real vanilla sales.

Most vanilla flavorings used in baking, confectionery, and in many frozen desserts contain some vanillin, ethyl vanillin, vanitrope, or a combination of these products. Vanillin accounts for over 90 percent of the

U.S. market for vanilla flavorings. The market for synthetics is expected to remain strong because of their relatively low and stable prices, as well as their reliability of supply and quality.

The original vanilla extract is made from the pods of the tropical climbing orchid, *Vanilla planifolia*. The seed pods are cured to develop the characteristic vanilla aroma and the essence (glycoside) is extracted in alcohol to yield the vanilla extract for commerce (13.35 ounces of vanilla beans with a moisture content of not more than 25 percent make a gallon of extract). Artificial vanillin is synthesized from other materials such as eugenol obtained from other sources such as cloves and coal tar.

Figure 1
U.S. import value of spices and spice oleoresins

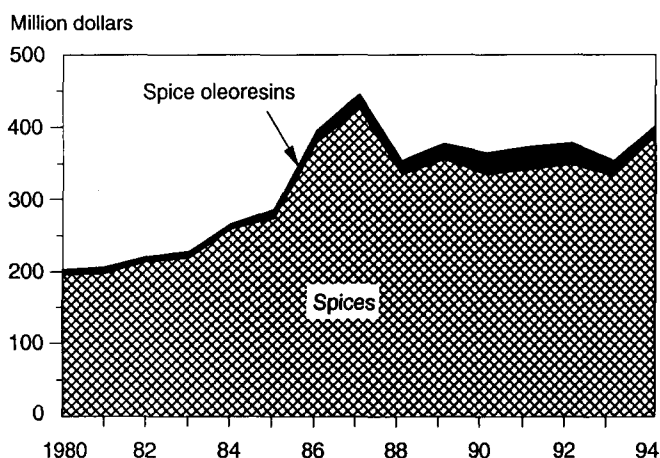
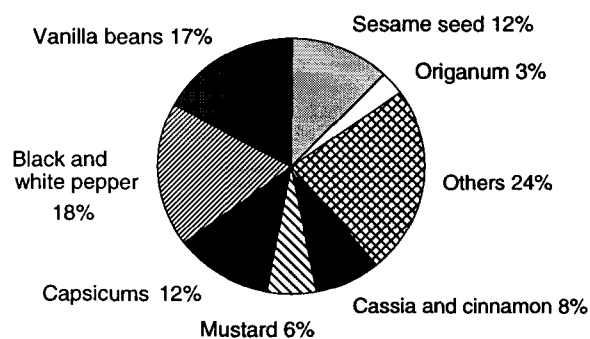


Figure 2
U.S. value of major spice imports, 1990-94¹



^{1/} Annual average total = \$348.3 million 1990-94, excluding spice oleoresins.

Table 1--U.S. import of spices 1/

Year	Spices		Spice oleoresins		Total spice and spice oleoresins	
	Volume	Value	Volume	Value	Volume	Value
	1,000 pounds	\$1,000 dollars	1,000 pounds	\$1,000 dollars	1,000 pounds	\$1,000 dollars
1980	322,354	195,304	741	7,543	323,094	202,847
1981	352,577	196,762	1,023	9,826	353,600	206,588
1982	343,746	212,983	773	8,657	344,519	221,640
1983	370,095	218,676	895	9,138	370,990	227,815
1984	415,894	258,278	995	8,479	416,888	266,757
1985	399,579	273,775	1,411	12,652	400,990	286,426
1986	437,352	377,929	1,526	17,355	438,878	395,284
1987	441,243	424,321	1,680	21,499	442,922	445,820
1988	398,266	333,519	1,708	20,378	399,974	353,897
1989	478,369	354,647	2,070	22,900	480,439	377,548
1990	503,369	334,052	2,264	30,266	505,634	364,318
1991	505,075	340,363	2,394	32,634	507,469	372,997
1992	528,565	347,634	2,512	30,108	531,077	377,742
1993	518,895	332,379	2,100	20,957	520,995	353,336
1994	581,018	387,146	1,789	14,324	582,807	401,470

1/ Specified condiments, seasonings, and flavoring materials.

Sources: U.S. Department of Agriculture and U.S. Department of Commerce.

Table 2--U.S. total agricultural imports and spices share

Year (Jan.-Dec.)	Total agricultural imports			Total spice imports 3/	Spice share of noncompetitive imports
	Competitive 1/	Noncompetitive 2/	Total		
-----Million U.S. dollars-----					
1980	10,358	7,043	17,401	203	2.9
1981	11,171	5,736	16,907	207	3.6
1982	9,985	5,360	15,345	222	4.1
1983	11,009	5,527	16,536	228	4.1
1984	12,619	6,716	19,335	267	4.0
1985	13,067	6,902	19,969	286	4.1
1986	13,436	8,017	21,453	395	4.9
1987	13,781	6,621	20,402	446	6.7
1988	14,691	6,263	20,954	354	5.7
1989	15,610	6,139	21,749	378	6.2
1990	17,202	5,568	22,770	364	6.5
1991	17,139	5,580	22,719	373	6.7
1992	18,946	5,678	24,624	378	6.7
1993	19,362	5,618	24,980	353	6.3
1994	20,087	6,731	26,818	401	6.0

1/ Competitive imports consist of all imports similar to agricultural commodities produced commercially in the United States.

2/ Noncompetitive imports include all agricultural commodities not grown in the United States, such as rubber, coffee, tea, cocoa beans, bananas, and most spices. 3/ Total spice imports include spice oleoresins.

Source: U.S. Department of Agriculture.

Table 3--U.S. agricultural trade value

Year	Agricultural exports 1/	Agricultural imports 2/	Trade balance
-----Million dollars-----			
1980	41,233	17,401	23,832
1981	43,339	16,907	26,432
1982	36,627	15,345	21,282
1983	36,099	16,536	19,563
1984	37,804	19,334	18,470
1985	29,041	19,968	9,073
1986	26,222	21,453	4,769
1987	28,709	20,402	8,307
1988	37,080	20,955	16,125
1989	39,909	21,749	18,160
1990	39,363	22,770	16,593
1991	39,192	22,719	16,473
1992	42,930	24,624	18,306
1993	42,609	24,981	17,628
1994	45,704	26,818	18,886

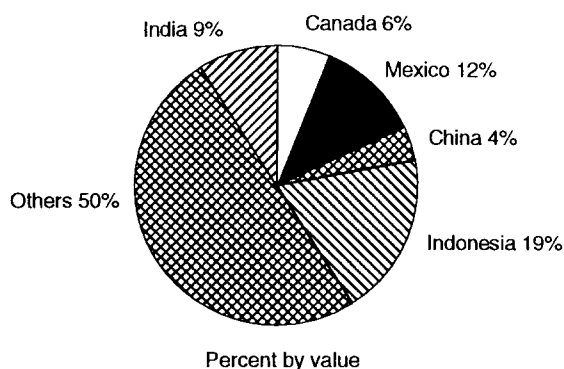
1/ Agricultural export products exclude re-exports. 2/ Agricultural imports for consumption, customs value.

Source: U.S. Department of Agriculture.

In recent years, Indonesia has become the largest supplier to the U.S. market, reflecting the significantly lower price for "Java" vanilla beans, compared with most other sources. Other important suppliers are Madagascar, the Comoros, and several Pacific Island sources (table 4).

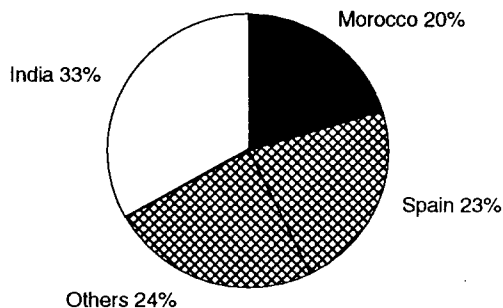
U.S. imports of vanilla beans were valued at an annual average of \$61.6 million for 1990-94. This compares with import values averaging \$58.8 million for 1985-89, and \$39.1 million for 1980-84. The expansion of the U.S. import value of vanilla beans is due mostly to larger import volumes rather than higher prices. The volume of vanilla bean imports averaged 2.7 million pounds for 1990-94, up from 2.4 million for 1985-89, and 1.6 million for 1980-84.

Figure 3
U.S. spice import shares by major source of supply, 1990-94¹



1/ Annual average total=\$348.3 million 1990-94, excluding spice oleoresins.

Figure 4
U.S. spice oleoresin import shares by major source of supply, 1990-94¹



1/ Annual average total = \$25.7 million 1990-94.

The unit import value of vanilla beans in 1993 and 1994 were down sharply from the early 1990's and especially the mid-1980's. For the period 1990-94, the average unit import value of vanilla beans was \$22.7 per pound versus \$24.6 for 1985-89 and \$24.1 average for 1980-84. These unit values compare with spot market prices for vanilla beans (Madagascar, Bourbon), which were \$29.0 a pound in 1994, and averaged \$34.1, 1990-94; \$35.8, 1985-89; and \$42.3, 1980-84 (appendix table 4).

Black and white pepper (*Piper nigrum*). The United States is the largest pepper importer, accounting for over one-quarter of annual world imports. The leading suppliers are Indonesia, India, and Brazil (table 5). Other important suppliers include Malaysia, Thailand, Sri Lanka, and Mexico. Pepper re-exports from Singapore are also an important source of supply. Black pepper is used whole in seasoning soups and meats and in pickling. In the ground form, black pepper is used to season practically all types of prepared meats and other foods. White pepper is used in white sauces and in other foods where pepper flavor is desired but not the dark specks of black pepper. Pepper is also used to make an extract or oleoresin, which is increasingly used in the industrial/foodservice sector. The oleoresin has a concentrated and consistent flavor, is relatively free of bacteria contamination, and contains no fiber.

Pepper imports usually rank as the second spice import after vanilla in terms of total dollar value. For the 1990-94 period, black pepper imports averaged \$52.9 million; white, \$10.9 million; and ground, \$1.4 million, for a combined total of \$65.2 million, representing 19 percent of total U.S. spice imports. While substantial, these recent import value levels are well under those of the mid-1980's, when historically high prices pushed U.S. combined pepper imports to the \$170 million level in 1986 and 1987 (appendix table 1).

The volume of pepper imports has been trending generally up in recent years, reflecting growth in demand. Total pepper imports averaged 98.1 million pounds annually during 1990-94, of which black pepper accounted for 86 percent (84.4 million pounds). This compares with combined pepper imports averaging 79.3 million pounds, 1985-89, and 72.6 million, 1980-84. Demand for black pepper underpinned this growth, accounting for 87 percent (68.6 million) of the total, 1985-89, and 90 percent (65.6 million), 1980-84. There also has been an upward trend in imports of white and ground pepper. In 1994, total pepper im-

Table 4--U.S. imports of vanilla beans 1/

Year	Volume	Value	Unit value	Leading sources of U.S. supply 2/
(Jan-Dec)	1,000 pounds	\$1,000	\$/pound	
1980	756.2	18,615.5	24.62	
1981	1,411.4	31,248.2	22.14	
1982	1,948.4	45,196.1	23.20	
1983	2,154.8	50,811.6	23.58	
1984	1,855.0	49,933.8	26.92	
1985	1,638.3	47,578.3	29.04	
1986	2,310.9	61,130.0	26.45	
1987	3,058.7	77,499.2	25.34	
1988	2,682.4	61,937.5	23.09	
1989	2,441.4	46,125.3	18.89	
1990	2,149.9	47,757.9	22.21	
1991	2,883.4	69,044.1	23.95	
1992	2,781.3	65,700.0	23.62	
1993	2,936.1	63,483.2	21.62	
1994	2,744.3	61,855.3	22.54	

1/ HTS No. 0905000000. 2/ Average 1990-94, based on volume of imports.

Source: Bureau of Census, U.S. Department of Commerce.

Table 5--U.S. imports of pepper, black 1/

Year	Volume	Value	Unit value	Leading sources of U.S. supply 2/
(Jan-Dec)	1,000 pounds	\$1,000	\$/pound	
1980	65,353.6	50,778.1	0.78	
1981	62,971.5	36,327.9	0.58	
1982	61,312.7	30,504.3	0.50	
1983	62,492.4	29,296.9	0.47	
1984	76,071.4	56,704.4	0.75	
1985	60,453.8	73,414.4	1.21	
1986	83,914.7	152,962.7	1.82	
1987	69,163.6	147,807.7	2.14	
1988	59,391.2	95,161.0	1.60	
1989	70,148.4	77,261.4	1.10	
1990	72,707.6	58,609.5	0.81	
1991	85,671.2	52,206.8	0.61	
1992	89,485.2	41,705.2	0.47	
1993	79,297.5	41,026.0	0.52	
1994	94,822.1	70,997.3	0.75	

1/ HTS No. 0904110020, does not include white pepper or ground white or black pepper. 2/ Average 1990-94, based on volume of imports.

Source: Bureau of Census, U.S. Department of Commerce.

Table 6--U.S. imports of other capsicums, unground 1/

Year	Volume	Value	Unit value	Leading sources of U.S. supply 2/
(Jan-Dec)	1,000 pounds	\$1,000	\$/pound	
1980	9,566.1	5,239.9	0.55	
1981	9,592.1	5,321.5	0.55	
1982	9,976.4	6,049.3	0.61	
1983	13,117.7	6,915.6	0.53	
1984	14,777.4	7,879.5	0.53	
1985	13,645.9	7,084.1	0.52	
1986	14,689.2	6,479.8	0.44	
1987	16,620.0	7,949.6	0.48	
1988	17,770.6	10,773.7	0.61	
1989	29,136.1	28,211.6	0.97	
1990	25,777.8	20,660.5	0.80	
1991	23,541.2	24,807.3	1.05	
1992	33,179.0	38,543.7	1.16	
1993	32,629.4	27,691.5	0.85	
1994	33,747.6	23,965.6	0.71	

1/ HTS No. 0904206000. 2/ Average 1990-94, based on volume of imports.

Source: Bureau of Census, U.S. Department of Commerce.

ports were a record 109.4 million pounds, reflecting growth in demand despite a sharp upturn in prices.

However, unit import values and market prices were lower in 1994 and in the early 1990's than during most of the 1980's. Unit import values for black and white pepper for the period 1990-94 averaged 63 and 87 cents a pound, respectively. This contrasts with an average of \$1.57 a pound, 1985-89, and 62 cents a pound, 1980-84 for black pepper, and \$1.95 a pound, 1985-89 and 88 cents a pound, 1980-84, for white pepper (appendix table 3).

These import unit values track well with actual market prices. For example, New York spot prices for Indonesian Lampung black pepper averaged 77 cents a pound, 1990-94, \$1.87 a pound, 1985-89, and 79 cents a pound, 1980-84 (appendix table 4). Similarly, Indonesian Muntok white pepper prices averaged 99.5 cents a pound, 1990-94, \$2.24 a pound, 1985-89, and \$1.12 a pound, 1980-84. The downturn in world prices reflects abundant supplies relative to demand. New plantings made during the high price years of the mid-1980's reached their maximum bearing age by the early 1990's. Moreover, reduced sales to the former Soviet Union contributed to the depressed market for pepper. However, prices have strengthened since their recent low point in 1992, largely reflecting a drought in the pepper growing areas of Indonesia and a drawdown of global stocks in order to meet consumption needs. Also, farmers have not been making new plantings and have not given adequate farm maintenance to existing vines and have been shifting to other crops.

Capsicum and paprika peppers (*Capsicum spp.*)

One of the fastest growing spice import groups in the U.S. market is capsicum (cayenne or red peppers). The three basic types of capsicum products in demand are chilli powder, chiles, and paprika (the mildest of the capsicum peppers). They are used in pickling, relishes, catsup, sauces, and in processed meat and fish. The rapid growth in both domestic and imported peppers is largely due to the changing American diet and the growing influence of Hispanic foods and population.

Anaheim and ancho red peppers largely are imported from Mexico. Other capsicums come from Asia, particularly India, China, and Pakistan, while about one-half of ground capsicums come from Mexico (table 6). In contrast, paprika imports largely originate in Spain, Morocco, and Hungary. These imports supplement the growing domestic production of capsicum

and paprika peppers in New Mexico, California, and Arizona (text box 2).

Capsicum imports have grown in importance in recent years, reflecting growth in demand for this spice group by both the home consumer and the food processing industry. The value of combined capsicum imports totaled \$38.8 million in 1994, of which imports of anaheim and ancho capsicum accounted for 6 percent; paprika, 17 percent; ground capsicum, 15 percent; and other capsicum, 62 percent (appendix table 1). The total value of combined capsicum imports averaged \$44.6 million in 1990-94, compared with \$24.7 million in 1985-89, and \$15.5 million in 1980-84.

Sesame Seed (*Sesamum indicum*). Sesame seed is one of the largest spices imported into the United States in both volume and value. It is widely used by the baking industry and has been very popular as a topping for yeast-leavened buns in the fast-food sector. The leading sources of supply are Mexico (nearly one-half), Guatemala, and El Salvador, together accounting for 84 percent of total shipments (1990-94). Other Central American countries, India, and China are also important sources of supply (table 7).

Imports of sesame seed averaged \$43.7 million and 84.6 million pounds for 1990-94, versus \$29.8 million and 81.0 million pounds for 1985-89, and \$34.9 million and 80.4 million pounds in 1980-84. The recent upturn in the value of imports while volume has remained relatively stable reflects higher market prices. The unit import value averaged 51 cents a pound for 1990-94, 37 cents for 1985-89, and 43 cents for 1980-84. These values parallel average monthly New York spot prices for sesame seed, Central American hulled, of 69 cents in 1990-94, 57 cents in 1985-89, and 66 cents in 1980-84 (appendix table 4).

Cassia and Cinnamon (*Cinnamomum spp.*) Beginning in 1989, U.S. trade statistics combined imports of cassia and cinnamon. Both cassia and cinnamon currently have the same tariff number, and the Federal Trade Commission of the United States has determined that either can be sold under the name cinnamon. Cinnamon quills or curls, obtained from the bark of the tropical *Cinnamomum zeylanicum* tree, are widely used in pickling, preserves, pudding, flavorings, and stewed fruit. In ground form, the largest end-use is in baking, followed by confectionery and beverages. Cassia is widely used in the making of doughnuts. Prospects for further growth in cassia and cinnamon are linked to the expansion of the commer-

From *The Great Chile Book*: Are Chiles Really Peppers?

by Gary Lucier¹

Confusion over chilean terminology began with Columbus, who gave peppers their name assuming they were the black peppercorns of the Indies. The genus for peppers, *Capsicum*, includes sweet varieties called bell peppers, and hot varieties usually known as chile peppers. As for spelling, chile means the hot pepper, chili refers to the spicy meat and bean dish, and chilli is the ground spice containing chiles, according to *The Great Chile Book* (Ten Speed Press, Berkeley, California). Webster allows all three spellings for the hot pepper.

Another source of confusion is mistaking a whole species or type of chile pepper for a single cultivar. The five domesticated species in the pepper genus, *C. annuum*, *C. frutescens*, *C. chinense*, *C. pubescens*, and *C. baccatum*, contain dozens of pod types and hundreds of cultivars. Except for the tabasco chile pepper in the *C. frutescens* species and the habanero in *C. chinense*, most chile peppers are in the *C. annuum* species.

Major pod types include bell and pimento for sweet peppers; New Mexican, Jalapeno, Serrano, and Ancho for hot peppers; and paprika and cherry which have both kinds. Some examples of cultivars are the Anaheim and New Mexico chiles in the New Mexican pod type, and the Jalapeno cultivar in the Jalapeno type.

Chile peppers are usually green and occasionally yellow when immature, and may be red, orange, brown, or yellow when ripe. Green chiles are frequently eaten fresh, while the sweeter ripened chiles are often used decoratively and ground into powder. Here's a sample of some popular chiles:

Anaheim. Long, green chiles used in sauces and stews. The ripened red chile is also used decoratively in wreaths and sold powdered as Chile Colorado.

Cayenne. Small, dried red peppers, used most frequently in powdered form as a spice, and heavily used in hot sauces.

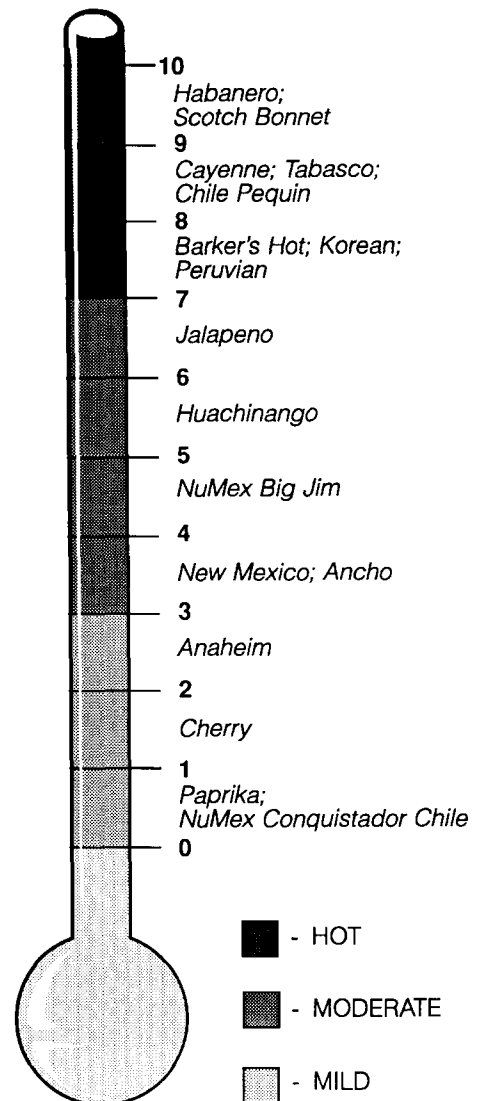
Habanero. Small, lantern-shaped chile in the *C. chinense* species that is one of the world's hottest

peppers; colors include dark green, red, orange, and orange-red.

Jalapeno. Top chile pepper variety exported to the United States from Mexico--the very popular chiles eaten on nacho chips; smoked, dried red jalapeno (chipotle) is used in soups, salsas, and sauces.

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Scoville Organoleptic Test



cial specialty baking sector. Indonesia is by far the leading source of supply with 90 percent of the market. Other sources are Sri Lanka, China, and re-exports from Singapore (table 8).

Cassia and cinnamon imports, both in quill and ground form, have been trending up in recent years. Import volumes averaged 30.0 million pounds for quills and 1.5 million for ground cassia and cinnamon for 1990-94. This compares with 28.7 million pounds for quills and 0.8 million for ground for 1985-89, and 22.7 million and 0.7 million for 1980-84 (appendix table 2). For 1990-94, imports in quill and ground form totaled an average value of \$27.9 million, compared with \$29.7 million (1985-89), and \$14.6 million (1980-84) (appendix table 1).

Unit import values for cassia and cinnamon quills averaged 87 cents a pound for 1990-94, compared with 80 cents in 1985-89, and 50 cents for 1980-84. Ground cinnamon is usually valued about one-third higher, averaging \$1.18 a pound in 1990-94 (appendix table 3). New York monthly average spot prices for cinnamon, Ceylon H-2 grade, averaged \$2.41 a pound in 1990-94, \$1.49 in 1985-89, and \$1.21 in 1980-84 (appendix table 4).

Mustard seed (*Brassica juncea*). The United States produces a small amount of mustard seed, with the bulk of its requirements coming from imports. Mustard consumption has been growing in the United States, reflecting its common use in the home and especially in fast-food establishments. The rise in use also reflects, to a degree, the waste common in the use of minipackets of mustard at fast-food establishments. Imports are likely to continue to dominate supply as U.S. farmers are not expanding production due to relatively low prices and availability of more remunerative crop options. Almost all mustard seed is imported from Canada (table 9).

Combined U.S. mustard imports for 1990-94 averaged \$20.2 million, of which mustard seed accounted for 79 percent and ground for 21 percent. Import volume, the largest of any of the spice group, averaged 135.1 million pounds in 1990-94, with a unit import value of 13 cents a pound for mustard seed. For the two preceding 5-year periods, total mustard imports averaged \$15.8 million and 102.5 million pounds in 1985-89 and \$13.0 million and 76.4 million pounds in 1980-85. New York spot prices for Canadian No. 1 yellow mustard seed were 26 cents a pound in 1994, relatively unchanged over the last 4 years (appendix table 4).

Oregano (*Origanum vulgare*). The recent growth of oregano or origanum imports reflects increasing demand spurred by its use in the rapidly expanding market for pizza, consumed from frozen products, pizza parlors, and the fast-growing home-delivery market. Turkey, Mexico, and Indonesia are the leading sources of U.S. imports (table 10).

Imports of origanum averaged \$12.1 million in 1990-94, up from \$7.9 million in 1985-89, and \$5.7 million in 1980-84 (appendix table 1). Unit import values in 1994 were \$1.12 cents a pound, up from \$1.03 in 1993, and 97 cents in 1992. This compares with New York spot prices for Mexican origin oregano of 95 cents a pound in March 1992, \$2.50 in March 1993, and \$1.40 in March 1994 (appendix table 5). In March 1995, prices moved up again to \$2.50 a pound.

Cumin (*Cuminum cyminum*). The value of cumin imports averaged \$12.0 million in 1990-94, \$4.7 million in 1985-89, and \$5.5 million in 1980-84. Cumin is used whole and ground in prepared meats, pickles, sausages, chilli powder, and soups. Pakistan and Turkey are leading sources of supply (table 11). The market for cumin has been expanding, reflecting growing use in both Hispanic and Asian foods.

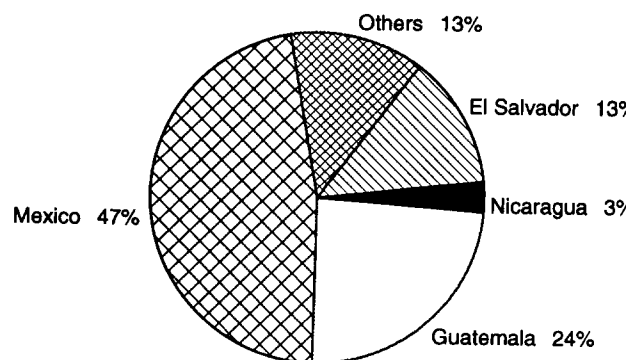
Annual import volume was a record 15.0 million pounds in 1994 and averaged 12.5 million pounds during 1990-94. This compares with 9.2 million (1985-89), and 8.8 million (1980-84), respectively. Unit import values had been generally trending up, averaging 68 cents a pound in 1990-94, compared with 51 cents for the previous 5-year period. This compares with New York spot prices for Indian origin cumin seed of \$1.50 a pound in 1992, \$1.15 a pound in 1993, and 87 cents a pound in 1994.

Saffron (*Crocus sativus*). Saffron is the world's most expensive spice. Saffron is used as a culinary adjunct including flavoring and coloring foods. The reason for its costliness is that saffron comes from the stigmas of a crocus and no other part of the plant is used. An acre planted with saffron will yield only 8 to 12 pounds of dried spice per year. Despite its high price, demand remains strong because of its distinctive taste and intense yellow color. Spain, the largest producer, is the largest source of U.S. imports, with most of the balance coming from Costa Rica, Italy, and India (table 12).

U.S. imports of saffron have been reported separately only since 1989. Imports totaled \$3.2 million in 1994 and averaged \$3.5 million in 1989-93. The volume of imports totaled a record 17,200 pounds in 1994, up

Table 7--U.S. imports of sesame seed 1/

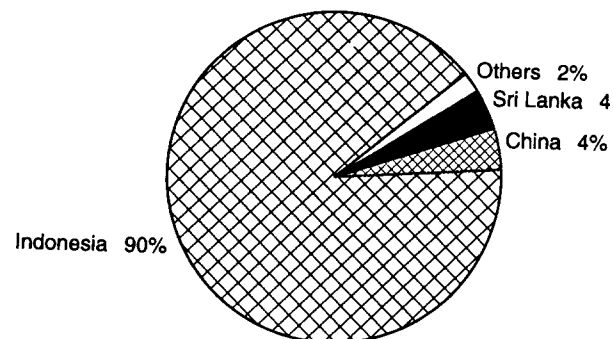
Year	Volume	Value	Unit value	Leading sources of U.S. supply 2/
(Jan-Dec)	1,000 pounds	\$1,000	\$/pound	
1980	69,603.0	33,559.9	0.48	
1981	83,674.2	35,202.3	0.42	
1982	73,222.1	32,454.4	0.44	
1983	94,334.5	39,962.8	0.42	
1984	81,039.7	32,986.0	0.41	
1985	82,307.8	31,013.6	0.38	
1986	80,063.1	25,747.0	0.32	
1987	80,508.2	26,541.8	0.33	
1988	73,075.1	25,702.1	0.35	
1989	89,318.3	39,961.7	0.45	
1990	94,531.5	56,869.0	0.60	
1991	80,381.6	40,643.0	0.51	
1992	77,145.3	42,729.7	0.55	
1993	81,401.5	34,819.5	0.43	
1994	89,321.4	43,195.6	0.48	



1/ HTS No. 1207400000. 2/ Average 1990-94, based on volume of imports.
Source: Bureau of Census, U.S. Department of Commerce.

Table 8--U.S. imports of cassia and cinnamon quills 1/

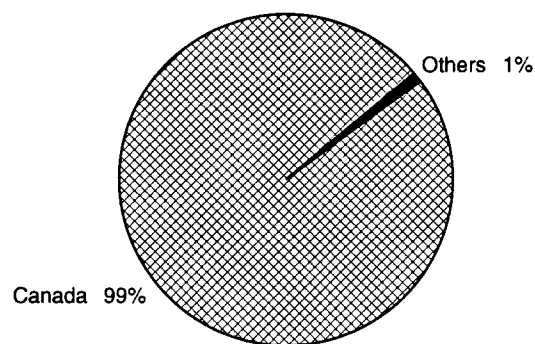
Year	Volume	Value	Unit value	Leading sources of U.S. supply 2/
(Jan-Dec)	1,000 pounds	\$1,000	\$/pound	
1980	21,899.6	10,373.8	0.47	
1981	19,880.2	10,885.0	0.55	
1982	20,064.9	10,478.9	0.52	
1983	21,641.5	10,013.3	0.46	
1984	29,891.6	14,493.6	0.48	
1985	27,363.8	13,929.5	0.51	
1986	28,161.2	16,800.3	0.60	
1987	31,382.4	26,554.1	0.85	
1988	24,736.1	22,131.8	0.89	
1989	31,777.4	36,395.6	1.15	
1990	24,076.9	22,253.3	0.92	
1991	30,639.8	26,279.5	0.86	
1992	33,170.2	26,609.2	0.80	
1993	29,744.2	24,943.2	0.84	
1994	32,392.8	29,683.4	0.92	



1/ HTS No. 096100000. 2/ Average 1990-94, based on volume of imports.
Source: Bureau of Census, U.S. Department of Commerce.

Table 9--U.S. imports of mustard seed 1/

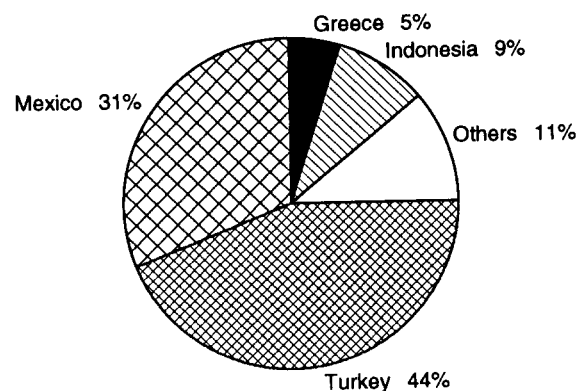
Year	Volume	Value	Unit value	Leading sources of U.S. supply 2/
(Jan-Dec)	1,000 pounds	\$1,000	\$/pound	
1980	64,922.6	8,251.5	0.13	
1981	77,362.8	10,984.8	0.14	
1982	69,787.3	11,549.0	0.17	
1983	70,394.9	10,599.9	0.15	
1984	82,104.1	13,071.7	0.16	
1985	87,832.1	14,257.2	0.16	
1986	91,079.3	13,373.1	0.15	
1987	100,535.8	11,431.2	0.11	
1988	90,301.5	9,243.5	0.10	
1989	102,549.1	12,631.3	0.12	
1990	122,632.8	17,812.2	0.15	
1991	121,901.7	17,390.8	0.14	
1992	122,846.0	14,775.0	0.12	
1993	116,718.8	13,910.3	0.12	
1994	140,954.0	15,785.6	0.11	



1/ HTS No. 1207500000. 2/ Average 1990-94, based on volume of imports.
Source: Bureau of Census, U.S. Department of Commerce.

Table 10--U.S. imports of origanum 1/

Year	Volume	Value	Unit value	Leading sources of U.S. supply 2/
(Jan-Dec)	1,000 pounds	\$1,000	\$/pound	
1980	6,060.7	4,896.7	0.81	
1981	6,763.6	5,118.7	0.76	
1982	8,360.6	6,917.6	0.83	
1983	7,921.4	6,198.3	0.78	
1984	9,563.9	4,877.0	0.51	
1985	7,905.8	4,174.3	0.53	
1986	12,116.8	8,239.1	0.68	
1987	11,536.6	12,869.7	1.12	
1988	7,615.4	6,659.5	0.87	
1989	7,465.5	5,529.3	0.74	
1990	10,339.0	7,336.9	0.71	
1991	11,834.6	10,158.7	0.86	
1992	11,336.5	11,036.5	0.97	
1993	14,515.3	15,019.9	1.03	
1994	15,033.6	16,858.6	1.12	

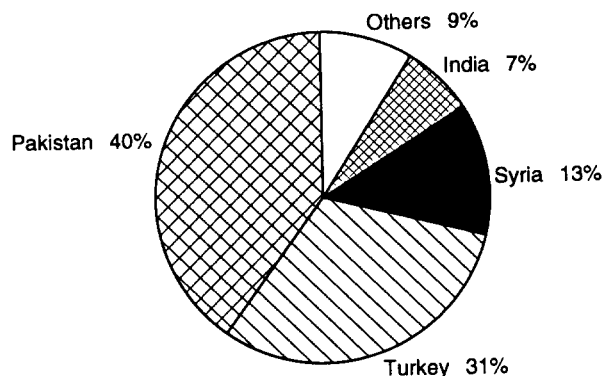


1/ HTS No. 0910992000. 2/ Average 1990-94, based on volume of imports.

Source: Bureau of Census, U.S. Department of Commerce.

Table 11--U.S. imports of cumin 1/

Year	Volume	Value	Unit value	Leading sources of U.S. supply 2/
(Jan-Dec)	1,000 pounds	\$1,000	\$/pound	
1980	7,993.1	5,381.0	0.67	
1981	10,420.4	6,115.0	0.59	
1982	8,888.8	5,993.7	0.67	
1983	7,038.7	4,837.5	0.69	
1984	9,700.1	5,329.1	0.55	
1985	8,688.4	3,296.2	0.38	
1986	8,239.8	4,183.1	0.51	
1987	10,358.6	6,846.3	0.66	
1988	8,157.1	4,461.2	0.55	
1989	10,377.6	4,539.3	0.44	
1990	10,296.9	4,672.3	0.45	
1991	8,850.5	5,551.1	0.63	
1992	14,187.0	12,596.1	0.89	
1993	11,532.0	9,221.2	0.80	
1994	15,044.0	9,531.6	0.63	

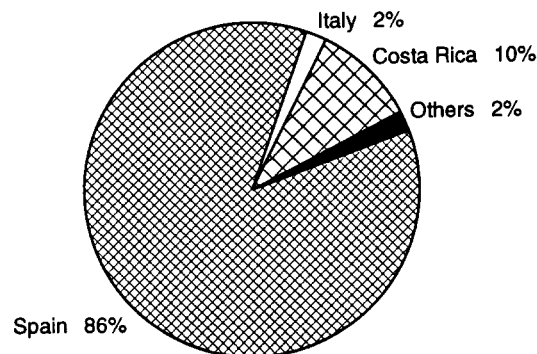


1/ HTS No. 0909300000. 2/ Average 1990-94, based on volume of imports.

Source: Bureau of Census, U.S. Department of Commerce.

Table 12--U.S. imports of saffron 1/

Year	Volume	Volume	Value	Unit value	Leading sources of U.S. supply 2/
(Jan-Dec)	Kilograms	1,000 pounds	\$1,000	\$/pound	
1980	NA	NA	NA	NA	
1981	NA	NA	NA	NA	
1982	NA	NA	NA	NA	
1983	NA	NA	NA	NA	
1984	NA	NA	NA	NA	
1985	NA	NA	NA	NA	
1986	NA	NA	NA	NA	
1987	NA	NA	NA	NA	
1988	NA	NA	NA	NA	
1989	3,048	6.7	3,266.2	486.1	
1990	3,172	7.0	3,213.2	459.5	
1991	3,335	7.4	3,380.8	459.8	
1992	3,197	7.0	3,173.4	450.4	
1993	7,907	17.4	4,206.6	241.3	
1994	8,600	19.0	3,201.1	168.8	



NA=Not available. 1/ HTS No. 0910200000, not reported separately under TSUSA. 2/ Average 1990-94, based on volume of imports.

Source: Bureau of Census, U.S. Department of Commerce.

from 8,200 pounds for the previous 5 years when information was reported separately. The unit import value averaged \$464 per pound in 1989-92, then dropped to \$242 per pound in 1993 and \$168 per pound in 1994 reflecting a sharp increase in supply. New York spot prices for Spanish saffron averaged \$523 per pound in 1989-92 and then fell to \$355 in 1993 and \$274 in 1994 (appendix table 4).

Nutmeg and Mace (*Myristica fragrans*). Imports of nutmeg and mace are combined in this report since these spices come from the same tropical tree species, *Myristica fragrans*. The seed of this tree is the nutmeg of commerce, and the membrane, called an aril that surrounds the seed, becomes mace. Indonesia has about two-thirds of the U.S. import market for nutmeg and Grenada in the West Indies, most of the remainder. Singapore is a source of re-exported nutmeg (table 13). Indonesia is by far the leading source of supply of mace.

Nutmeg is used for flavoring foods, sauces, and beverages--eggnog is the best known. Mace has similar uses. U.S. importers have a preference for deep-brown aromatic nutmeg and orange-red mace from Indonesia. Prospects for growth above recent levels will likely pivot on nontraditional uses.

Nutmeg and mace imports were valued at \$3.9 million in 1990-94, down from an average of \$11.0 million in 1985-89, and comparable with the \$4.2 million registered for 1980-84. The volume of nutmeg and mace imports declined slightly over the three time periods, 4.6 million pounds in 1990-94, 4.8 million in 1985-89, and 5.3 million in 1980-84 (appendix tables 1 and 2). A decline in unit import values mostly explains the fall-off in the total value of imports, with values over the last several years averaging 80 cents a pound for nutmeg, less than one-half the unit values of \$2.1 per pound in 1985-89 (table 13).

Recent lower prices reflect world production that continues to exceed demand. New York spot prices for West Indian whole nutmegs averaged \$2.33 per pound for 1990-94--dipping to \$1.05 in 1994, compared with \$2.67 for 1985-89, and \$1.00 during 1980-84 (appendix table 4). Indonesian nutmegs averaged 88 cents a pound in 1990-94, down from \$2.55 cents in 1985-89, and comparable with 1980-84 levels. New York spot prices for Indonesian No. 2 Siauw mace siftings averaged \$1.61 per pound in 1990-94, compared with record highs of \$5.41 per pound in 1985-89, and \$2.18 for 1980-85. In addition to oversupply, prices have been in a downtrend since

the collapse of the marketing agreement between Indonesia and Grenada in May 1990. The agreement had been in effect since April 1987 and was established to set minimum export prices and quotas for nutmegs and mace.

Allspice (*Pimento*) (*Pimenta officinalis*). This spice, native to the Americas, is used in the industrial and home baking of cakes, biscuits, pies, and in pickles. Allspice is also commonly used in meat and fish products. Jamaica is the principal source of U.S. imports followed by Honduras, Guatemala, and Mexico. Small amounts also came from China and Indonesia in recent years (table 14).

Imports have remained relatively consistent from year to year in value and volume terms. Allspice or pimento averaged \$1.8 million and 2.2 million pounds in 1990-94, \$1.6 million and 1.9 million pounds in 1985-89, \$1.5 million and 1.6 million pounds in 1980-84. The unit import values have ranged from a 15-year low of 68 cents a pound in 1994 to a high of \$1.05 cents in 1984. In 1993, the average import value was 88 cents a pound and the New York average monthly price for Guatemalan allspice was 94 cents (appendix table 4).

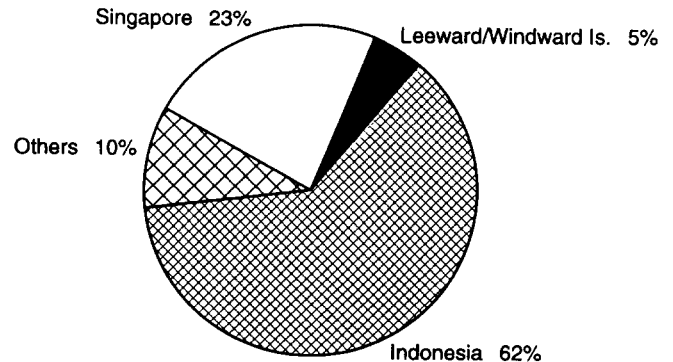
The lack of growth in the use of allspice is attributed to the decline in the baking of specialty products and to its relatively high price, especially the Jamaican variety. Substantial growth in consumption and therefore imports will depend on development of non-traditional applications.

Turmeric (*Curcuma longa*). Turmeric is widely used as a food coloring and flavoring agent, particularly in mustard products. In addition, turmeric is used as an ingredient in curry powder. Market growth is linked to the consumption of imported curry powder, which has been on the upswing in recent years. Consumers in America prefer turmeric with an orange-yellow color and a mild, ginger-pepper flavor exemplified by the Indian variety. India has been the dominant source of supply followed by Thailand and Indonesia. China has been also an important supplier in recent years (table 15). The size of India's crop, stock levels, and the level of demand from India's oleoresin manufacturers have a strong influence on prices.

U.S. imports of turmeric averaged \$2.4 million in 1990-94, \$2.3 million in 1985-89, and \$1.4 million in 1980-84. Import volume was at a record 5.7 million pounds in 1992 but fell to 3.8 million in 1994. This compares with 4.3 million pounds in 1990-94; 4.4 mil-

Table 13--U.S. imports of nutmegs (whole and ground) 1/

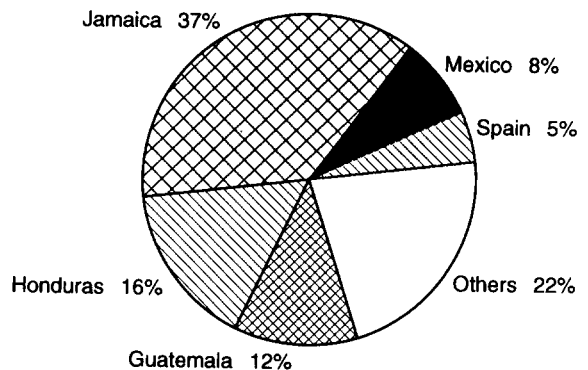
Year	Volume	Value	Unit value	Leading sources of U.S. supply 2/
(Jan-Dec)	1,000 pounds	\$1,000	\$/pound	
1980	4,527.6	4,126.9	0.91	
1981	4,855.7	3,605.9	0.74	
1982	5,393.8	3,627.1	0.67	
1983	4,602.6	3,014.0	0.65	
1984	4,455.3	3,029.4	0.68	
1985	4,701.1	3,312.7	0.70	
1986	4,035.8	6,898.0	1.71	
1987	4,729.6	12,873.3	2.72	
1988	3,397.8	9,879.0	2.91	
1989	4,222.1	11,073.0	2.62	
1990	3,771.9	5,088.6	1.35	
1991	4,097.1	3,019.3	0.74	
1992	3,715.2	2,357.6	0.63	
1993	4,069.9	2,446.4	0.60	
1994	5,178.2	3,534.0	0.68	



1/ HTS No. 0908100000. 2/ Average 1990-94, based on volume of imports.
Source: Bureau of Census, U.S. Department of Commerce.

Table 14--U.S. imports of allspice (pimento) 1/

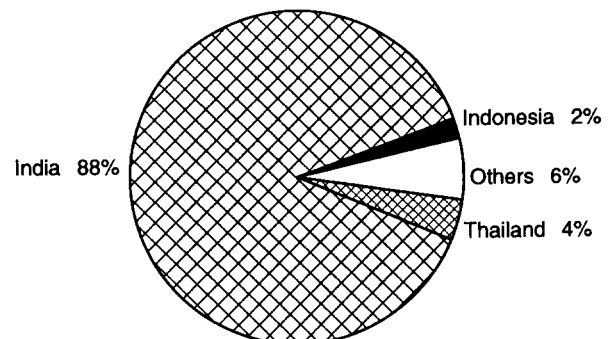
Year	Volume	Value	Unit value	Leading sources of U.S. supply 2/
(Jan-Dec)	1,000 pounds	\$1,000	\$/pound	
1980	1,620.6	1,266.3	0.78	
1981	1,797.9	1,440.2	0.80	
1982	1,155.0	1,124.4	0.97	
1983	1,676.0	1,612.9	0.96	
1984	1,870.8	1,973.2	1.05	
1985	1,540.6	1,567.8	1.02	
1986	1,704.4	1,469.6	0.86	
1987	1,919.1	1,683.5	0.88	
1988	2,045.7	1,545.5	0.76	
1989	2,487.3	1,827.3	0.73	
1990	2,231.3	1,770.5	0.79	
1991	2,305.2	1,870.1	0.81	
1992	1,898.8	1,707.9	0.90	
1993	2,495.0	2,200.4	0.88	
1994	2,227.5	1,519.2	0.68	



1/ HTS No. 0904208000. 2/ Average 1990-94, based on volume of imports.
Source: Bureau of Census, U.S. Department of Commerce.

Table 15--U.S. imports of turmeric 1/

Year	Volume	Value	Unit value	Leading sources of U.S. supply 2/
(Jan-Dec)	1,000 pounds	\$1,000	\$/pound	
1980	3,415.4	1,182.9	0.35	
1981	4,106.1	1,129.6	0.28	
1982	3,536.7	946.8	0.27	
1983	3,527.6	1,368.6	0.39	
1984	3,944.3	2,155.0	0.55	
1985	4,630.4	2,661.1	0.57	
1986	4,561.6	2,615.2	0.57	
1987	4,258.2	1,836.2	0.43	
1988	3,614.0	2,021.9	0.56	
1989	4,733.5	1,807.2	0.38	
1990	3,728.2	1,374.5	0.37	
1991	4,120.7	2,063.6	0.50	
1992	5,744.3	4,075.5	0.71	
1993	4,390.0	2,035.4	0.46	
1994	3,814.8	1,735.1	0.45	



1/ HTS No. 0910300000. 2/ Average 1990-94, based on volume of imports.
Source: Bureau of Census, U.S. Department of Commerce.

lion, 1985-89; and 3.7 million, 1980-84. Unit import values have gone from a 14-year low of 27 cents a pound in 1982 to a high of 71 cents in 1992. In 1994, values dropped to 46 cents, close to the averages for the three periods--50 cents a pound in 1990-94; 50 cents in 1985-89; and 37 cents in 1980-84.

Cloves (*Syzygium aromaticum*). The United States is a relatively small consumer of cloves. This spice is used in pickling and preserves as well as baking, confectionery, and desserts. Clove oil is used as a flavoring for chewing gum and candy. Since clove oil contains 80-95 percent eugenol, it is also used for the synthesis of vanillin. Indonesia is the world's largest consumer and producer, where between 175-200 million pounds annually are used in the manufacture of "Kretek" cigarettes. Madagascar is by far the main exporter. Other leading sources of shipments to the U.S. market have been Brazil and Indonesia (table 16).

Import values for this high-value, low-volume spice have declined sharply in recent years. Clove imports have averaged \$2.0 million for 1990-94, compared with \$3.6 million in 1985-89, and \$7.9 million in 1980-84. While the volume of U.S. imports increased some in recent years--2.9 million pounds in 1990-94, 2.5 million in 1985-89, and 2.1 million in 1980-84--the unit import value also has been on a steady downward trend from \$3.78 per pound in 1980-84, \$1.48 in 1985-89, and 65 cents in 1990-94, with 1993 and 1994 registering lows of 44 cents a pound. This decline closely paralleled monthly average New York spot prices for cloves (Madagascar/Zanzibar) of \$4.44 per pound in 1980-84, \$1.81 cents in 1985-89; and 82 cents in 1990-94, with a low of 49 cents in 1994. Large Indonesian production and stocks, together with weak global demand, have led to depressed clove prices. The oversupply situation had been compounded by the emergence of new producers, such as Brazil.

Other Spice Imports

A number of other spices are imported into the United States in significant volumes (see appendix tables 1, 2, and 3, for long-term trends). Appendix table 3 provides a time series on unit import prices which are f.o.b. values. Appendix tables 4 and 5 provide spot New York prices for selected spices.

Anise (*Pimpinella anisum*). Value of imports averaged \$2.3 million annually the last 5 years (1990-94), and \$1.4 million during the 1980's. Record imports of \$3.4 million were registered in 1993 reflecting

both higher prices and record volume of 2.95 million pounds. Value and volume of imports fell to \$2.5 million and 2.8 million pounds in 1994. Turkey is the major supplier--around two-thirds of total annual imports. Anise is used both whole and ground to flavor candy and pastry. It has a flavor similar to licorice. New York average monthly spot prices (Turkish) were \$1.13 a pound in 1993 and 92.2 cents in 1994.

Basil (*Ocimum basilicum*). Value of imports averaged \$3.3 million (1990-94) and \$1.7 million during the 1980's. Record imports of \$4.6 million were recorded in 1994 due to record import volume of 7.1 million pounds. Egypt is the major supplier with over 80 percent of the U.S. market. Basil's sweet and warm flavor make it popular for seasoning soups, meat, pies, and vegetables. Unit import values in 1994 were 65 cents a pound; spot New York market prices ranged from 46 to 73 cents for Egyptian basil.

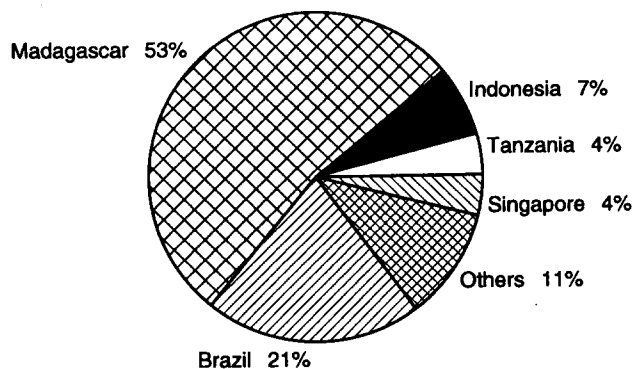
Caraway seed (*Carum carvi*). Value of imports averaged \$3.7 million (1990-94) and \$3.8 million during the 1980's. The Netherlands is the largest supplier, accounting for about 75 percent of the market. Caraway seed is popular in breads, rolls, cheese, and in pickling. The volume of imports has been fairly steady in recent years, but jumped from 7.2 million pounds in 1992 to 8.6 million in 1993 and 8.4 million in 1994. Unit import values in 1994 were 79 cents a pound, versus \$1.00 in the spot New York market.

Cardamom (*Elettaria cardamomum*). Imports averaged \$1.1 million (1990-94). Guatemala is the principal supplier, about 90 percent of the total. The U.S. food processing industry uses whole cardamoms as a mixed pickling spice, and in the ground form as a flavoring for pastries, in curry powders, and in spice blends for sausages. The volume of imports in recent years has ranged between 300,000 to 550,000 pounds annually. The unit import value is relatively high, averaging \$2.93 a pound in 1994. Guatemalan mixed greens on the New York market averaged \$2.97 a pound in 1994.

Celery seed (*Apium graveolens*). Import value of celery seed averaged \$1.7 million (1990-94) and \$1.9 million during the 1980's. India is by far the leading supplier, with over 90 percent of the U.S. import market. Celery seed is commonly used for seasoning for soups and sauces and compounding with salt to produce celery salt. Annual import volumes are relatively steady but jumped nearly 20 percent to 6.9 million pounds in 1993, then fell to 6.0 million

Table 16--U.S. imports of cloves 1/

Year	Volume	Value	Unit value	Leading sources of U.S. supply 2/
(Jan-Dec)	1,000 pounds	\$1,000	\$/pound	
1980	2,105.4	8,094.2	3.84	
1981	2,082.3	8,098.2	3.89	
1982	2,439.9	11,005.5	4.51	
1983	1,479.1	5,672.3	3.84	
1984	2,363.6	6,703.3	2.84	
1985	2,475.1	4,444.2	1.80	
1986	2,364.7	4,413.1	1.87	
1987	2,238.8	3,358.2	1.50	
1988	2,915.8	3,721.3	1.28	
1989	2,500.9	2,328.5	0.93	
1990	4,080.3	3,645.0	0.89	
1991	2,513.7	2,243.5	0.89	
1992	2,547.9	1,503.0	0.59	
1993	2,744.7	1,207.9	0.44	
1994	2,906.8	1,288.3	0.44	



1/ HTS No. 0907000000. 2/ Average 1990-94, based on volume of imports.
Source: Bureau of Census, U.S. Department of Commerce.

pounds in 1994. Unit import value was 23 cents a pound in 1993 and 34 cents in 1994.

Coriander seed (*Coriandrum sativum*). Imports averaged \$1.4 million annually during 1990-94 and \$1.8 million in the 1980's. Canada and Morocco are the largest suppliers, accounting for 80 percent of the market in recent years. Coriander is used whole as a mixed pickling spice and in ground form to season meats and sausages, and as an ingredient in curry powder. Volume of imports has been relatively steady in recent years. Unit import value in 1994 was 27 cents a pound, compared with under 28 cents the previous 4 years.

Curry and curry powder. Imports have been trending up in recent years and averaged \$1.6 million in 1990-94 and \$1.0 million during the 1980's. The main sources are India and Japan. Curry powder consists of a blend of numerous ground spices such as turmeric, fenugreek, ginger, black and cayenne pepper, coriander, and caraway. It is commonly used in the United States as a flavoring for rice, veal, chicken, shrimp, and other dishes. The volume of imports has been trending up slowly, with record imports of 1.3 million pounds in 1994. Unit import values for curry have been in the \$1.40-\$1.60-a-pound range the last several years.

Dill (*Anethum graveolens*). Import value has averaged \$731,200 annually (1990-94), and \$570,000 during the 1980's. India captures about three-fourths of the U.S. import market. Dill is used whole and ground in making dill pickles, and in soups, salads, sauces, and processed meats. The annual volume of

imports has been moving up. Record imports of 2.1 million pounds were recorded in 1994, up from 1.8 and 1.6 million the previous 2 years. Unit import values have been at or close to 50 cents a pound the last 3 years, comparable with New York average monthly spot prices.

Fennel (*Foeniculum vulgare*). Value of imports has averaged \$3.4 million in 1990-94 and \$1.7 million during the 1980's. Egypt and India together account for about 90 percent of imports. Fennel seed is used whole or ground to season bread, rolls, pastry, pickles, fish dishes, and sauces. The volume of fennel imports has been trending slowly up in recent years. Unit import values have averaged 56 cents a pound the last 5 years.

Ginger (*Zingiber officinale*). U.S. imports of ginger have been growing fairly steadily. Ginger has numerous uses in the food and beverage industry. In baking, it is used in biscuits and gingerbread. It is also used as a seasoning in meat, pickles, and soups. Large quantities of ginger are used by the beverage industry for the manufacture of ginger ale and other soft drinks. Leading sources of supply include India, Fiji, Indonesia, and Jamaica. Peeled Jamaican ginger is known for its high quality. New York spot prices for Indian Cochin material averaged 66 cents a pound in 1993 and 74 cents in 1994 (appendix table 4).¹

¹ Not included is the large amount of fresh ginger imported annually.

Laurel (Bay) leaves and thyme (*Laurus nobilis* and *Thymus spp.*). U.S. trade statistics combine these two spice items, the average annual value of imports for which was \$3.9 million in 1990-94 and \$2.2 million during the 1980's. Spain and Turkey are the main sources of supply with Turkey the main source of laurel imports.² These traditional spices are used in soups and meat dishes. Import volume shifts marginally from year to year. Unit import values have been between 90 cents and \$1.10 a pound the last several years.

Mint Leaves (*Mentha spicata*).³ Import value has averaged approximately \$311,000 in 1990-94 and \$490,000 during the 1980's. Egypt is by far the largest supplier--more than 50 percent. Mint is very popular in home cooking and as a commercial flavoring for mint jelly, candies, and mouthwashes. U.S. demand is filled both from imports, mostly peppermint and spearmint, and domestic production. Unit import values have averaged between 60 and 80 cents a pound the last 5 years, after record-high values of \$1.35 and \$1.53 a pound in 1987 and 1988.

Parsley (*Petroselinum crispum*). U.S. imports of dehydrated or manufactured parsley come from several countries, most importantly Israel and Mexico. Manufactured parsley sold as a spice is used in many typical Italian processed foods and in a number of home-prepared fish and meat dishes. The value of imports averaged \$1.8 million in 1990-94, compared with \$1.0 million in 1985-89. Record import value, \$4.2 million, and volume, 2.9 million pounds, were recorded for 1994.

Poppy seed (*Papaver somniferum*). Imports averaged \$4.9 million in 1990-94 and \$3.1 million in the 1980's. For 1994, imports were a record \$9.6 million reflecting increased volume and unit values. Australia and the Netherlands are the main suppliers, together accounting for over 90 percent of imports. Poppy seeds are very popular in a variety of bakery goods. Import volume trended up in recent years reaching a record 12.9 million pounds in 1994. Unit import values rose over 50 percent in 1993 to 44 cents a pound, then to 75 cents in 1994, but still well under the record \$1.42 cents recorded on the New York spot market in 1994.

Sage (*Salvia officinalis*) Imports averaged \$4.8 million annually (1990-94), compared with \$5.1 million during the 1980's. Albania and the former Yugoslavia are the traditional sources of supply. Sage is a spice commonly used in processed meats and sausages and is an indispensable part of preparing "bread stuffing" which accompanies America's traditional Thanksgiving turkey or other poultry dishes. The volume of sage imports has been up in recent years, but dipped to 4.1 and 4.2 million pounds in 1993 and 1994. Sage unit import values were \$1.03 a pound in 1994 and averaged \$1.08 a pound for 1990-94.

Mixed spices and others. The United States imports a number of spices--including mixtures in the "other spices" category (HTS No. 091090000 and HTS No. 0910996000). USDA includes in the data imports of spices such as marjoram, rosemary, savory, and tarragon which were previously listed separately. The import value of these mixed spices averaged \$6.9 million in 1990-94, \$7.0 million in 1985-89, and \$3.8 million in 1980-85.

Spice Oleoresin Imports

U.S. imports of spice oleoresins, principally paprika and black pepper, averaged \$25.7 million in 1990-94, \$19 million in 1985-89, and \$8.7 million in 1980-84 (table 17). Spice oleoresins contain the aroma and flavor of the spice in a concentrated form. Technically, spice oleoresins are obtained from dried spices by extraction with a volatile nonaqueous solvent, which is subsequently removed from the oleoresin by evaporation at moderate temperatures and under partial vacuum. The oleoresin contains the aroma and flavor of the spice (including any nonvolatile principles, unlike spice essential oils) in concentrated form, and are usually viscous liquids, or semisolid materials. Because of their high concentration, oleoresins cannot be incorporated into food products unless they are diluted. The dilution is usually achieved by dissolving the oleoresin in alcohol, propylene glycol, or other appropriate solvents to make an essence; or by dispersing the oleoresin on a dry carrier, such as salt, dextrose, or starch; or emulsifying the oleoresin with gum acacia, or one of the soft starches, followed by spray drying to produce an encapsulated spice.

Demand in the United States is increasing as oleoresins offer certain advantages over natural spices, such as consistency of quality, freedom from microorganisms, uniform dispersion in the product, and easy handling and storage. Trends in unit import prices of paprika and black pepper oleoresins are given in table 17. USDA does not have information on the level of

² Laurel is increasingly being produced in California.

³ ASTA does not consider mint a spice. USDA spice data include mint.

Table 17--U.S. imports of spice oleoresins

Year	Paprika			Black pepper			Other			Total
	1,000 pounds	\$1,000	\$/pound	1,000 pounds	\$1,000	\$/pound	1,000 pounds	\$1,000	\$/pound	
1980	282.8	4,355.2	15.40	202.8	1,672.1	8.25	254.9	1,515.4	5.95	7,542.7
1981	616.3	6,301.7	10.22	232.7	1,860.6	7.99	174.0	1,663.9	9.56	9,826.2
1982	233.3	4,720.2	20.23	324.1	2,213.9	6.83	215.3	1,722.6	8.00	8,656.7
1983	416.0	5,471.0	13.15	271.8	1,809.5	6.66	207.3	1,857.8	8.96	9,138.3
1984	555.1	4,947.7	8.91	243.7	1,745.5	7.16	195.9	1,786.1	9.12	8,479.3
1985	737.3	6,828.3	9.26	348.5	3,138.0	9.00	325.7	2,685.2	8.24	12,651.5
1986	766.9	9,767.6	12.74	398.5	4,713.7	11.83	360.4	2,873.4	7.97	17,354.7
1987	811.6	11,275.5	13.89	481.0	7,009.2	14.57	387.3	3,214.0	8.30	21,498.7
1988	746.6	11,360.2	15.22	484.7	5,158.6	10.64	477.1	3,859.1	8.09	20,377.9
1989	775.6	14,468.2	18.65	290.8	2,976.1	10.24	1,003.6	5,455.9	5.44	22,900.2
1990	956.0	19,012.6	19.89	419.7	3,951.2	9.41	888.7	7,302.6	8.22	30,266.4
1991	802.5	18,734.5	23.35	600.4	4,979.6	8.29	991.5	8,920.1	9.00	32,634.2
1992	989.9	18,648.8	18.84	496.2	3,574.3	7.20	1,025.6	7,884.9	7.69	30,108.0
1993	640.2	10,469.0	16.35	632.1	2,948.3	4.66	827.4	7,539.7	9.11	20,957.0
1994	107.8	2,320.9	21.53	587.7	3,542.6	6.03	1,093.0	8,460.0	7.74	14,323.5

Source: U.S. Department of Commerce.

U.S. production of oleoresins. U.S. imports of spice oleoresins are dominated by India.

Imports of Dehydrated Vegetables Used As Spices

Dehydrated garlic and onions are the leading dehydrated vegetables used as spices. The United States is a significant importer and exporter of these spices (table 18). The average value and volume of dehydrated garlic imports in 1990-94 were \$5.0 million and 10.0 million pounds, respectively. In recent years, the main sources of supply have been China, Hong Kong, and Mexico. During the 1980's, dehydrated garlic imports averaged \$1.2 million but generally grew during the decade, reflecting increased volume. Unit import value averaged 49 cents a pound in 1990-94 and 59 cents during the 1980's. Dehydrated garlic is used for seasoning beef, poultry, and fish dishes.

Dehydrated onion imports averaged \$2.2 million and 3.7 million pounds in 1990-94, compared with under \$200,000 and about 550,000 pounds during the 1980's. China and Mexico were the leading suppliers. Unit import values averaged 63 cents a pound in 1990-94. Dehydrated onions are used for seasoning beef, poultry, and fish dishes.

U.S. Spice Production

The U.S. agricultural sector produces several spices that are used to supplement imports needed to meet

domestic demand. These include capsicums, mustard seed, dehydrated onion and garlic, and several herbs used as spices. U.S. spice production has expanded over the last decade, up by two-thirds from 1983 to 1994 (figure 5). For the 1990-94 period, U.S. production of spices averaged an estimated 318.3 million pounds, compared with 232.4 million for 1985-89, and 195.8 million in 1980-84. These data are derived largely by ASTA sources as USDA does not have a comprehensive breakdown of production by use as spices.

New Mexico is an important producer of capsicums used both as spices and other uses. According to New Mexico's State Department of Agriculture, production of dried chile peppers in 1994 totaled 97.8 million pounds, dry basis, from 27,900 acres for a total value of \$53.5 million (table 19). Production used as spices averaged 50.3 million pounds in 1990-93, 35.3 million in 1985-89, and 26.1 million in 1980-85, according to industry data. Output is up largely due to expansion in area harvested, reflecting good prices and the growing demand for capsicums. Luna County in southwestern New Mexico accounted for nearly three-quarters of the expansion.

California is also a significant producer of dried chile peppers used for spices and other uses. For the 1990-

93 period, production averaged 45.6 million pounds.⁴ This compares with annual average production of 19.3 million in 1985-89, and 21.2 million in 1980-84 (table 20). Production takes place mostly in the coastal Salinas Valley in Central California. Table 21 provides a comprehensive USDA supply-use table for dried chile peppers in the United States including data for New Mexico, California, and Arizona.

Mustard seed is grown commercially in the United States in several Northern Great Plains States, with the Dakotas and Montana the principal producers. According to USDA sources, U.S. production in 1994 is estimated at 13.0 million pounds, compared with 12.4 and 14.5, respectively, during the previous 2 years. Production averaged 12.6 million pounds in 1990-94, 14.7 million in 1985-89, and 26.2 million in 1980-84. The smaller harvest in 1994 was due to an 18-percent decline in harvested area to 13,400 acres.

⁴ Data for 1994 were not available for this publication.

Table 18--U.S. imports of selected dehydrated vegetables (garlic and onions) used as spices

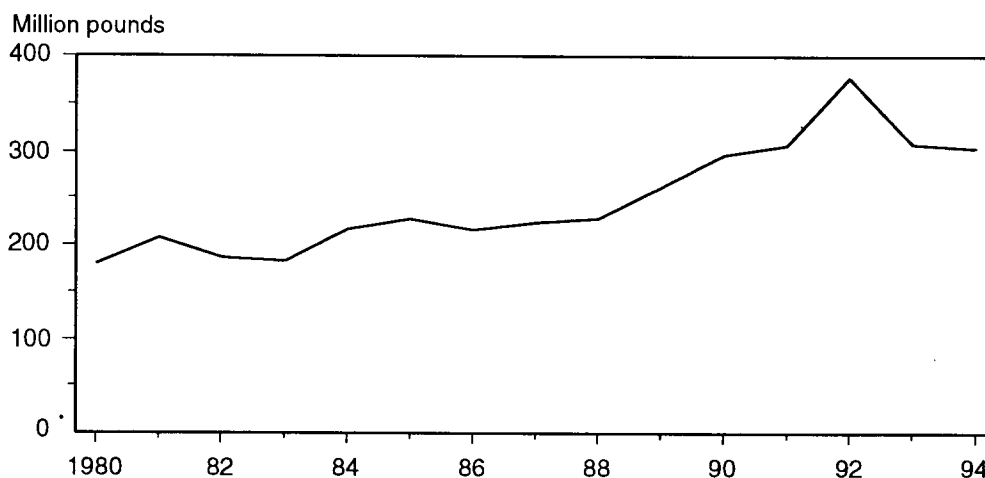
Year	Imports					
	Garlic			Onions		
	1,000 lb.	\$1,000	\$/lb.	1,000 lb.	\$1,000	\$/lb.
1980	291	251	0.86	91	63	0.69
1981	262	156	0.60	220	102	0.46
1982	3,521	2,099	0.60	26	34	1.31
1983	844	571	0.68	32	26	0.81
1984	397	297	0.75	244	169	0.69
1985	621	332	0.53	121	97	0.80
1986	3,080	1,281	0.42	81	35	0.43
1987	4,073	1,752	0.43	1,464	190	0.13
1988	3,052	1,352	0.44	235	53	0.23
1989	7,046	3,917	0.56	3,023	1,115	0.37
1990	13,827	8,583	0.62	5,588	3,553	0.64
1991	9,544	4,909	0.51	4,697	2,513	0.54
1992	5,858	2,649	0.45	2,653	1,619	0.61
1993	8,440	4,199	0.50	4,805	2,752	0.57
1994	12,223	4,599	0.38	734	570	0.78

Garlic dehydrated (HTS No. 0712904040).

Onion dehydrated (HTS No. 0712204000).

Source: U.S. Department of Commerce.

Figure 5
U.S. domestic production of spices



Source: Economic Research Service, USDA.

Table 19--New Mexico: Dried chile peppers, area harvested, yield, production, and farm value

Year	Area harvested	Yield	Production 1/	Farm value
	Acres	Pounds per acre	1,000 pounds	\$1,000
1980	17,200	2.72	46,800	26,325
1981	15,300	3.20	49,000	32,830
1982	14,600	3.40	49,600	29,859
1983	17,200	3.20	55,000	33,275
1984	17,000	3.20	54,400	29,920
1985	19,300	3.10	59,800	33,638
1986	22,100	3.20	70,720	37,269
1987	22,900	3.16	72,364	38,353
1988	22,210	3.26	72,404	38,555
1989	23,650	3.24	76,626	41,953
1990	28,700	3.26	93,562	53,564
1991	29,700	3.14	93,258	59,219
1992	34,500	3.10	106,950	67,379
1993	29,900	3.10	92,690	56,077
1994	27,900	3.51	97,798	53,455

1/ Dry weight basis. A 5.1 ratio was used to convert given tonnage to a dry weight equivalent for long hot and long mild varieties; an 8.1 ratio was used to convert jalapino green tonnage to a dry weight equivalent.

Source: New Mexico Department of Agriculture.

Table 20--California: Dried chile peppers, area harvested, yield, production, and farm value

Year	Area harvested	Yield	Production 1/	Farm value
	Acres	Pounds per acre	1,000 pounds	\$1,000
1980	5,457	10.05	54,828	11,685
1981	6,491	8.39	54,460	21,200
1982	4,711	11.14	52,462	23,714
1983	3,994	7.35	29,358	12,207
1984	3,483	7.28	25,350	12,338
1985	3,329	7.84	26,110	12,277
1986	1,684	9.72	16,368	5,918
1987	1,873	9.35	17,510	6,858
1988	3,665	7.25	26,560	14,003
1989	4,632	6.95	32,190	17,796
1990	5,305	7.73	41,008	27,187
1991	5,009	7.45	37,312	19,080
1992	6,680	7.05	47,112	30,882
1993	7,505	7.60	57,046	32,945

Note: California data for 1994 will not be available until mid-1995.

1/ Dry weight basis.

Source: California Agricultural Statistics Service.

Table 21 -- U.S. chile peppers, all uses -- dry-weight basis: Supply, utilization, and price, 1980-94

Year	Supply			Utilization				Season average price 4/	
	Production 1/	Imports 2/	Total	Exports 2/	Total	Per capita use		Current dollars 1/	Constant 1987 dollars
						Dry-weight	Fresh 3/		
	-----Million pounds-----					---Pounds---		---\$/short ton---	
1980	70.2	26.1	96.3	1.2	95.1	0.4	3.3	1,125	1,569
1981	79.6	26.7	106.3	1.5	104.9	0.5	3.6	1,340	1,698
1982	67.5	28.8	96.3	1.4	94.8	0.4	3.3	1,204	1,437
1983	70.5	33.3	103.8	1.6	102.1	0.4	3.5	1,210	1,388
1984	79.8	40.7	120.5	1.5	119.0	0.5	4.0	1,100	1,209
1985	83.4	45.2	128.6	1.5	127.1	0.5	4.3	1,125	1,192
1986	95.3	45.0	140.3	1.7	138.6	0.6	4.6	1,054	1,088
1987	95.3	44.6	139.9	1.5	138.4	0.6	4.6	1,060	1,060
1988	99.5	48.5	148.0	1.6	146.3	0.6	4.8	1,065	1,025
1989	106.6	63.5	170.1	3.6	166.5	0.7	5.4	1,095	1,009
1990	131.1	68.2	199.3	7.0	192.3	0.8	6.2	1,145	1,011
1991	140.7	63.4	204.1	7.8	196.2	0.8	6.2	1,270	1,080
1992	172.4	65.0	237.4	8.5	228.8	0.9	7.2	1,260	1,042
1993	149.0	73.1	222.1	11.7	210.4	0.8	6.5	1,210	980
1994 5/	160.0	43.2	203.2	5.6	197.6	0.8	6.1	--	--

-- Not available.

1/ Source: ERS estimates based on State-supplied data and AMS fresh shipments.

2/ Source: Bureau of the Census, U.S. Dept. of Commerce. Includes dehydrated (spices) and fresh. Exports represent actual data for dehydrated (spice) products plus

10 percent of the fresh pepper/pimento export category. 3/ Converted from dry weight to a fresh-weight equivalent using a factor of 8.0. 4/ Average price per dry ton in New Mexico. 5/ Forecast.

Source: Economic Research Service, USDA.

Dehydrated garlic and onion production from domestically produced fresh material has been growing in recent years. According to ASTA, combined dehydrated garlic and onion production, concentrated in California, totaled 200 million pounds, dry basis in 1993, compared with the average of 206.3 million in 1990-93, 159.0 million in 1985-89, and 120.6 million in 1980-84. Tables 22 and 23 provide area, yield, and production information for California garlic and summer onions provided by California's State Department of Agriculture and USDA's National Agricultural Statistics Service (NASS).

Domestic herb production used as spices is estimated at 4.5 million pounds for 1993 according to ASTA. This is unchanged from recent years, but double the level of the early 1980's. The leading herbs used in their form as spices are thyme, rosemary, marjoram, mint, basil, and parsley.⁵

⁵ Hawaii is a growing producer of ginger. This production is marketed fresh and is not included in this study, which counts only dried or ground ginger used as a spice.

U.S. Spice Utilization

Spice Exports

U.S. spice exports have been growing in recent years in both volume and value terms. Most of the exports classified as domestic merchandise by USDA consisted of ground spices and crude or processed herbs. Although few of these spices are grown commercially in significant quantities in the United States, spices exported from the United States are considered domestic merchandise for statistical purposes if the product has been enhanced in value by processing in the United States. Imported spices that are cleaned, sorted, or graded in the United States are considered to be domestic articles when exported. Canada, Japan, and Germany are the principal markets for U.S. exports of spices, seasonings, and condiments.

USDA's U.S. spice exports data, incorporating selected value added data, put exports at 94.8 million pounds in 1994, with a value approaching the \$100 million mark (table 24). Dehydrated onions and garlic are the leading exports, accounting for nearly half the total in value terms (table 24). Other leading ex-