

403) and adulterated food (section 402). For example, 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, bell peppers, etc.). FDA's definition of spices is similar to ASTA's. Dehydrated vegetables may not be labeled as "spices." Paprika, turmeric, and saffron or other spices which are also colors, shall be declared as "spice and coloring" unless declared by their common or usual name.

Imports of all spices, seeds, and herbs into the United States are subject to the health and sanitation regulations of the FDA. These regulations are intended to assure the consumer that foods are pure and wholesome, safe to eat, and have been produced under sanitary conditions. Examination is carried out by the FDA at the time of arrival. Laboratory tests may be requested by FDA to detect problems such as pesticide residues or salmonella.

Most spice cargoes are not sampled on the pier, but after the shipments have been moved to a warehouse or to the importer's plant. FDA clearance is required to move the product more than 50 miles from the port of entry. If moved, the entire shipment must be held intact until released by FDA.

The Government also plays an important role in the emerging new field of food irradiation. Some imported spices and other foods are treated with gamma radiation to kill bacteria, molds, and other disease-causing organisms. Plants that do this type of work are inspected regularly by the Nuclear Regulatory Commission and the Occupational Safety and Health Administration, among other agencies. Currently, however, radiation is not widely used on spices due to lack of widespread consumer acceptance. It is important to note that a food product using an irradiated spice as an ingredient does not have to be labeled. According to FDA, the labeling requirement applies only to a food that has been irradiated, not to a food that merely contains an irradiated ingredient but that has not itself been irradiated.

The U.S. Department of Agriculture (USDA) provides the U.S. spice industry with several direct and indirect public service functions. USDA provides farm extension and plant research information to domestic spice growers. USDA also performs a public service of compiling, analyzing, and distributing spice trade statistics and other market and nutrition information.

These functions are performed by USDA's Research, Education, and Economics' agencies and Foreign Agricultural Service.

USDA's Animal and Plant Health Inspection Service (APHIS) plays a leading regulatory role in preventing the importation of restricted articles. For example, before being imported into the United States, shipments of cumin seed from Pakistan packed in jute or burlap bagging are required to be fumigated with methyl bromide. APHIS requires that this be done, at the cost of the importer, to prevent the possible entry into the United States of Khapra beetle (*Trogoderma granarium Everts*). Another example is ginger root imports, which are prohibited from certain countries and require an import permit if shipped from other countries.

Outlook

The Bureau of the Census forecasts U.S. population to grow to 274.8 million by the year 2000. At the current (1990-94) per capita rate of 3.19 pounds, that would translate into total domestic use of spices of 877 million pounds in the year 2000, up 8 percent from the early 1990's base period (figure 14). But all indications are that the growth is likely to be even higher. The trend toward less salt in foods will likely continue to stimulate more condiment use to compensate for flavor loss. Growth in consumption of ethnic foods will also stimulate the rise in use of more and a greater variety of spices. The U.S. population is becoming both more Asian and more Hispanic. According to the U.S. Census Bureau, the Asian population grew from 4.4 million in 1982 to 8.2 million in 1992 and the Hispanic population grew from 15.9 million to 23.7 million in 1992. Moreover, Asian and Hispanic cuisine is increasing in popularity and this will continue to cause a surge in the use of spices common to these cultures. For example, capsicum spice imports increased by 85 percent from 32.0 million pounds in 1984 to 59.2 million in 1994--an indicator of the increasing popularity of Latin American foods.

Many restaurants are popularizing the terms "Pacific Rim" and "Tastes of Asia" cooking today, signifying a menu apt to offer dishes from any and/or all parts of Korea, Taiwan, Thailand, Vietnam, Burma, Malaysia, the Philippines, and Indonesia, as well as India, Japan, and the various regional cuisines of China. Typical spices of these countries--ginger, onion, garlic, red pepper, coriander (seeds, leaves), black and white pepper, anise, cumin, fennel, cloves, nutmeg, curry powder, cinnamon, star anise, mace, turmeric--

are increasingly being imported to service the growing demand.

While this growth scenario is most likely, there is the prospect of a downtrend for spices in general or, more likely, particular spices. Demand for spices is assessed as being price inelastic--that is, changes in prices either up or down are not likely to radically alter demand. What is changing consumption for spices is expansion due to population growth, incomes, and tastes in the American diet--particularly favoring ethnic and natural foods. However, if spice prices were to move sharply higher for a sustained period, artificial spice substitutes are frequently available to replace a natural spice that has become too expensive. A wholesale wave of substitutes could shift the demand curve for spices to the left, causing a contraction in consumption. Major U.S. spice processors have a number of artificial flavors ready in the test tube for many of the world's major spices if the need arises.

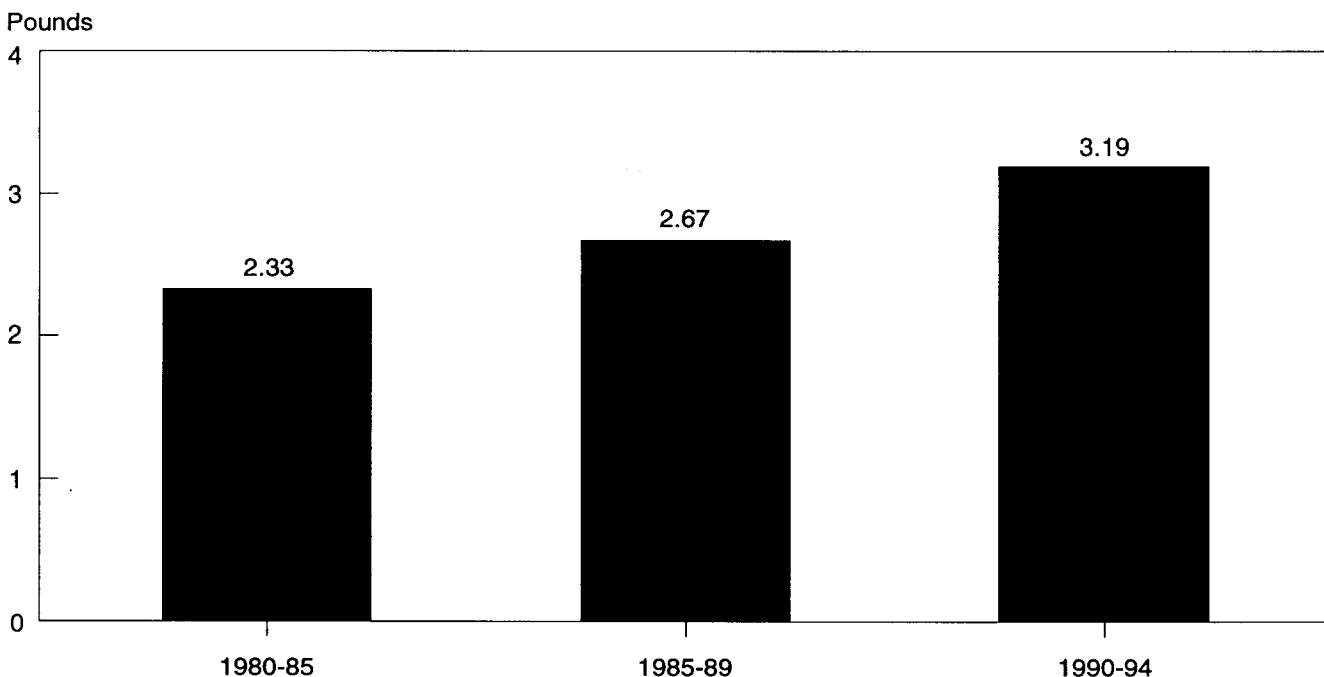
On the regulatory side, the heightened concern over food safety is likely to foster tightened compliance with existing regulations and perhaps the establishment of new ones. In food safety, an important area for possible reevaluation are techniques for spice sterilization such as the use of ethylene oxide, methyl bromide, and irradiation. Technically, irradiation

holds considerable promise, but issues of product labeling and consumer acceptance of the technique must be evaluated.

Focusing on trade, increased global sourcing programs have important implications for both importing countries such as the United States and exporting countries. With global sourcing, the buyer achieves greater purchase value, while the seller learns directly quality requirements of the buyer. Buyers heighten their knowledge of foreign crop conditions and improve their ability to analyze current market forces; sellers increase their knowledge of the buyer's current season demand. Buyers improve knowledge of crop potential and prospects for improvement and sellers gain greater perspective on the outlook for demand needs of buyers. Transfer of technology, such as process control and vendor certification, improves standards and capabilities in source countries and heightens the level of quality assurance in receiving countries. Improved prospects for manufacture of finished products at origin offer value-added exports to the source country and opportunities for buyers to resell finished products in growing third-country markets. Over the long run, these developments could lead to a diminished role for U.S. importers and dealers as some of their services (for example, re-cleaning) shift to source countries.

Figure 14

U.S. per capita spice consumption growing



Source: USDA.

The outlook for increased domestic production of certain spices is strong. While many spices will continue to be grown overseas due to comparative advantages in climate, soils, and labor costs, certain spices such as capsicum, and garlic and onions used for spices, should expand, reflecting prospects for expanded demand and remunerative prices. For example, the surge in chile demand has created opportunities for large and small growers. Based on the

continued popularity and expanded acceptance of Mexican or southwestern cuisine, and the discovery of new uses for chile pepper products, the U.S. chile pepper industry--and chile pepper demand--are expected to continue expanding. Growers are streamlining their production practices as well. Plant breeders and engineers, for example, are collaborating to devise a cost-effective machine harvester for chile peppers.

Methyl Bromide, the Montreal Protocol, and the U.S. Clean Air Act

The U.S. Environmental Protection Agency (EPA) ruled in 1990 that methyl bromide production and importation will be phased out completely by the year 2001. The ruling enforced the Clean Air Act, under which the United States complies with the Montreal Protocol. Methyl bromide's Ozone Depletion Potential (ODP) is 0.7, in excess of the 0.2 lower limit for substances to be classified as class I Ozone Depleting Substances, requiring phaseout within 7 years of listing. The action required under the Clean Air Act is more stringent than freezing methyl bromide production in 1995 at 1991 levels required by the Montreal Protocol. Protocol parties could agree to ban production, but have not done so. For plants and plant products considered potential conveyors of exotic pests, fumigation using methyl bromide is currently the principal method of quarantine treatment.