United States Chile Pepper Consumption Greater Than Ever

The United States produces 4 percent of the world’s sweet and hot chile peppers, ranking sixth behind China, Mexico, Turkey, Indonesia, and Spain. In China, output of chile pepper has steadily risen over the past decade, moving from one-third of world output in 1993-95 to one-half of production during 2003-05. During that time, output of sweet and hot chile peppers more than doubled in Mexico, reflecting duty-free export opportunities afforded by NAFTA, to expanding markets in Canada and the United States.

During the last decade, consumption of chile peppers in the United States has increased by 38 percent, moving from an annual average fresh-weight equivalent of 4.3 pounds per person during 1993-95 to 5.9 pounds during 2003-05. On a fresh-weight basis, consumers in the United States now use more chile peppers than many traditional vegetables, including asparagus, cauliflower, and green peas. If chile pepper consumption remains positive this decade, average use between 2004 and 2006 will be just below the growth experienced during the 1990’s (when use rose 25 percent from the 1980’s). Chile peppers were one of the fastest growing specialty produce items of the late 1980’s and early 1990’s and remain popular today. This is an illustration of the changing American diet, the quest for alternative flavors and coloring agents, and the growing influence of a diverse immigrant population.

Chile Pepper Is Grown in 49 States
According to the National Agricultural Statistics Service 2002 Census of Agriculture, 4,748 farms harvested chile peppers from 42,666 acres. This was up from 2,087 farms and 27,990 acres in 1987, with most of the gain in acreage occurring during the late 1980’s and early 1990’s. Like sweet bell peppers, a small volume of chile peppers are produced in greenhouses. In 2002, every state except Alaska reported having at least one farm growing chile peppers. While 54 percent of all chile pepper acreage is harvested for processing (canning, drying/dehydrating, freezing) in the United States, only 7 percent of...
farms with chile peppers harvest for processing. New Mexico accounts for 50 percent of all chile pepper acreage devoted to processing, followed by California (16 percent), Texas (13 percent), and Arizona (6 percent). By inference, the leading fresh-market states are New Mexico with 25 percent of the fresh-market area and California with 20 percent. Florida, Texas, and Georgia follow—each with about a 7 percent fresh-market chile pepper area.

From 2001 to 2005, farm cash receipts for chile peppers averaged $113 million, with New Mexico accounting for roughly 41 percent. The national chile pepper crop value estimated by USDA Economic Research Service (ERS) is undercounted by 30 percent, because only the top four states (NM, CA, AZ, TX) are included in the annual NASS production and value survey. The retail value of chile peppers is not reported, but estimates based on farm-retail value margins for bell peppers from NASS suggest it may exceed $500 million.

**New Mexico Is Top Chile Pepper Producer**

According to the 2002 Census of Agriculture, chile peppers were harvested on 282 farms in New Mexico. In fact, the largest concentration of chile pepper acreage in the United States is in southern New Mexico, centered largely in the Hatch Valley and outside the city of Las Cruces. The counties of Luna, Doña Ana, and Hidalgo account for about three-quarters of the State’s chile pepper acreage. According to the 2002 census, New Mexico harvests 39 percent of all chile pepper acreage in the United States, with 71 percent of its area earmarked for processing. Grower receipts from the sale of chile peppers averaged $46 million annually during 2002-04, accounting for 8 percent of the State’s cash crop receipts.

**Chile Pepper Imports Expanding**

Trade in chile peppers centers around fresh and dried spice products. Although dried/dehydrated chile pepper exports have been rising in recent years, fresh-market chile pepper exports are not broken down by sweet and hot types. ERS estimates suggest chile pepper exports are relatively small compared with imports, with about 7 percent of total U.S. chile pepper supply exported. Meanwhile, trade data, expressed on a fresh-equivalent basis, indicate that imports accounted for 72 percent of domestic supply during 2003-05. Because of rising domestic demand for fresh-market and manufacturing (food and other) uses, import penetration has steadily increased over the past two decades. Domestic use from imports has moved up to current levels from 37 percent during 1983-85 and 44 percent during 1993-05.

Compared with vegetables such as bell peppers and tomatoes, seasonal variation in chile pepper imports is relatively small, reflecting consistent monthly domestic demand. On average during the past five years, there was a slight dip in chile pepper import volume during the spring, likely reflecting peak chile pepper production in Florida. Fresh chile pepper imports tend to be strongest during the summer months prior to harvest in major producing states such as New Mexico.

Imports have helped meet the accelerating demand for chile peppers. The United States imported 425 million pounds of fresh chile peppers in 2005, about 82 percent more than a decade earlier. Dried and dehydrated chile pepper spice imports more than doubled during this period and were valued at over $81 million (excluding paprika).

Mexico provides 99 percent of U.S. fresh-market chile imports and is one of the largest consumers and producers of chile peppers in the world. Most of Mexico’s chile pepper production is in the northwestern coastal plain states of Sinaloa and Sonora where much of the export-oriented vegetable production is located. Chihuahua, an irrigated producing region bordering New Mexico and Texas, is also a source of chile peppers shipped to the United States.
In 2004, India was the top source in terms of dried/dehydrated chile pepper spice valued at $23 million. The United States also imported $19 million in canned chile peppers, led by Mexico (47 percent), Turkey (19 percent), and Peru (13 percent). Although paprika is not generally considered a chile pepper product because it is usually extracted from mild peppers, about $7 million in extracted oleoresins, essential oils, and resinoids from paprika were imported in 2005, with most coming from India (77 percent) and Spain (15 percent).

**RECIPE: Sweet Pickled Rainbow Bells**

> These pickles are great to serve with sandwiches, as a snack or as part of an antipasto plate. They also make a welcome gift and are most decorative if the colorful pepper strips are arranged in a pleasing pattern in the canning jar. Spices such as cloves, cinnamon sticks, and star anise can be added to the jar to vary the recipe.

These peppers become soft and lose quality faster than any other types of pickles, so plan to use them within one month. When choosing your peppers look for tall, brightly colored, firm peppers, each weighing about 6 ounces.

1 large red bell pepper  
1 large green bell pepper  
1 large yellow bell pepper  
1 large orange bell pepper  
2 cups white wine vinegar  
1/4 cup sugar  
1 tablespoon salt

Remove the stems, veins, and seeds from the peppers and slice them lengthwise into strips about 1 inch wide. Place the pepper strips in a large bowl, cover them with boiling water, and let stand for 5 minutes. Drain the peppers, and pack them standing up in 2 sterilized wide mouth pint jars. Alternate the colors of the peppers around the outside of the jar to give it a rainbow effect. The peppers in the middle of the jar can be arranged randomly. In the meantime, pour the vinegar into a small saucepan and add the sugar and salt. Bring the mixture to a boil, stirring to dissolve the sugar. Pour the vinegar mixture over the peppers to within 1/2 inch of the top. Carefully run a knife around the inside of the jar to release any air bubbles. Place the lid on the jar and refrigerate and use the peppers within one month. Makes 2 pints.

Recipe from *The Edible Pepper Garden*, available from the Chile Pepper Institute.
Earliest Evidence of Chile Pepper Cultivation and Distribution Discovered

This article is a detailed follow-up to a short news piece that was printed in the Spring 2007 edition of the Chile Pepper Institute Newsletter.

Chile peppers have become an integral part of cooking and culture far from their native range. Chile peppers originated in a remote area of South America and were introduced to places such as India and Thailand after Europeans explored the Western Hemisphere in the 15th century.

Recently, researchers have shed light on when and where chile peppers were first cultivated. This data may have potential use in the analysis of human transport and spread of invasive species. Humans first utilized chile peppers in the Americas, and European explorers and colonists later transported chile pepper and other Western Hemisphere plants all over the world. The exact time and place that domestication of chile peppers first occurred has proven difficult to establish, due in part to a lack of macrofossil remains for these tropical plants.

Research shows that chile peppers were cultivated and in widespread use across the Americas 6,000 years ago as occasional condiments and as components of a complex and sophisticated diet. The authors recovered microfossils of starch grains from grinding stones and cooking pots in archaeological sites from the Caribbean, Venezuela, and the Andes. They found Capsicum-specific starch grains in association with maize and manioc. Their evidence suggests three of the five species of domesticated Capsicum were cultivated together in Peru in both the coast and the highlands as long as 4,000 years ago. As humans moved around the planet, they carried their favorite foods and herbal medicines. Capsicum is notable in this regard, as it quickly became integral to a wide range of old world discipline, including Indian cuisine to Tibetan medicine. Other members of the Solanaceae, such as thornapple and tobacco, also had their native distributions obscured by human transport. The scientific name Datura was given to the thornapples by Linnaeus from the Sanskrit “dhustura,” but all species of Datura are native to the Americas.

New ways of studying ancient human use and transport of plants can contribute to our knowledge of the dynamics of introduction of species. The innovative use of starch grains from kitchen tools, and their elegant unraveling of the specificity of these grains to domesticated Capsicum, reveals more ancient cultivation and widespread use of this crop plant than previously reported. It also opens new avenues of research into how people of the Americas transported and traded plants of cultural importance. The authors found no starch grains of wild species of Capsicum in any of the sites they examined, showing that domestication of chile peppers had occurred long before these sites were occupied and that cultivation was routine. Where domestication of the five species of Capsicum occurred is currently speculative. Based on modern distribution and genetic analysis, C. annuum is thought to have been domesticated in Mexico or northern Central America, C. frutescens in the Caribbean, C. chinense in Amazonia, C. baccatum in Bolivia, and C. pubescens in the southern Andes. C. baccatum and C. pubescens are taxonomically distinct.

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Chile Pepper Diversity on Display

Research on chile peppers from the Agricultural Research Service (ARS) is being featured from June to November in an exhibit called "A Pepper for Every Pot" at the U.S. Botanic Gardens in Washington, D.C. This exhibit explores the diversity of chile peppers, including recently introduced varieties, and celebrates chile peppers' beauty, flavors, and nutritional benefits.

Among new chile pepper varieties that ARS has already developed are 'Tangerine Dream' and 'Black Pearl'. 'Tangerine Dream' is a sweet, edible ornamental chile pepper that produces small orange banana-shaped fruit on a prostrate plant. 'Black Pearl', offers gardeners a new dark choice with black leaves and shiny black fruit that ripen to bright scarlet. Both varieties are commercially available.

Chile peppers figured strongly in the Aztec, Mayan and Incan cultures, second only in importance to maize. Today, chile peppers are just as likely to show off in flower gardens as in vegetable gardens.

The New Mexico State University Chile Breeding and Genetics program expanded their research about 15 years ago to accommodate the diversity and beauty of ornamental chile peppers. The program recently released several dwarf ornamental chile peppers designed for the different holidays. 'NuMex Christmas', 'NuMex Valentine', 'NuMex St. Patrick's Day', 'NuMex Memorial Day', 'NuMex Halloween', and 'NuMex Thanksgiving' come in colors and shapes that fit their respective holiday. Seeds for these varieties are available through the Chile Pepper Institute.

Source: ARS news, June 2007

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Humans have radically altered the characteristics and distributions of the organisms we value. New data types like starch microfossils have enormous potential to help investigate the course of domestication, cultivation, and trade in a wide variety of crops whose histories have remained difficult to unravel due to their lack of preservation or their tropical origins.

Adapted from Sandra Knapp's article in Science, February 2007: Vol. 315. no. 5814, pp. 946 - 947.

Thousands of years of human and natural selection have produced hundreds of different pod shapes, colors and sizes from the wild bird peppers. The picture above shows the diversity of Capsicum baccatum.
Bell Pepper Consumption in the United States Reaches a Record High

The United States produced a total of 1.7 billion pounds of bell peppers in 2006, the highest volume in history. Consumption of imported bell peppers has increased by 8 percent since 2000 and consumption of domestic bell peppers has increased by 11 ounces per capita. Mexico supplies the largest volume of imported bell peppers, followed by Canada, the Netherlands, and India. From S&G Peppers Today, May, 2007.

Consumer Preferences for Color in Bell Peppers

Most bell peppers produced and consumed in the United States are green. However, there are several other color choices available in a large variety of markets, including orange, yellow, red, purple, and brown. An analysis of 435 consumer responses showed that color was about three times more important than retail price in determining consumers' purchase decisions. From HortScience Volume 4, 2001.

Chile Peppers Linked with Fertility

A new study presented at the 62nd annual meeting of the American Society for Reproductive Medicine claims that fruit and vegetables may be a key to sperm strength. Antioxidants like glutathione and cryptoxanthin, found in brightly colored produce such as tomatoes and chile peppers are associated with stronger, healthier sperm. The study concluded that men who ate at least five servings a day had greater fertility. From S&G Peppers Today, May, 2007.

New Research Publications Available

New Mexico State University has released several new research publications on chile peppers.

- Red Chile Reclaimer Evaluations, New Mexico Chile Task Force Report 27, August 2006.

To get your copy of these publications, visit the New Mexico State University College of Agriculture and Home Economics publications page at http://www.cahe.nmsu.edu/pubs/.

IS YOUR LABEL RED? IT'S TIME TO RENEW YOUR CPI MEMBERSHIP!!
BURNING QUESTIONS

Q. I know that dairy helps cut the heat after eating very hot chile peppers, but I recently heard that sugar does as well. Is this correct?

A. The very best way to cut the heat after eating hot chile peppers is, by far, to eat or drink a dairy product. The milk protein, casein, in dairy products breaks the binding site between capsaicinoids, chemicals causing the heat sensation, and the receptors in your mouth or on your skin. There is no scientific evidence that any other substance does this. Some people eat sugar, or bread, or drink water and the heat will seem to dissipate for a moment, but quickly comes back.

During the 2005 New Mexico Chile Conference a poster display entitled “Temporal Effectiveness of Sugars on Mouth Burn by Capsaicin,” created and researched by Rochelle Garranez, tested sucrose, fructose, and lactose to see if these would cut the burn of capsaicin in the mouth. The scientific results showed that “the sugars did not significantly alleviate mouth burn,” but colder solutions worked better than warmer ones. However, the burn returned after the sugar solution was expectorated. Interestingly, the anecdotal results were different. “Throughout the tasting period, panelists commented on how the sugars alleviated mouth burn, despite the statistical analysis.”

Q. Is there such a thing as green chile pepper intolerance? I seem to develop a stomach ache every time I eat green chile peppers, however I have no problems eating red chile peppers.

A. Certain people are more sensitive to green chile peppers than red chile peppers. This is due to the fact that green chile peppers are unripe fruit, while red are ripe. Because green chile peppers have less sugar, they may taste bitter. As the pod ripens, chemical changes occur in the fruit reducing the chemicals that cause stomach irritations in some people.