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## Production and marketing of vegetables for the ethnic markets in the United States

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### ABSTRACT

Due to the growing number of immigrants in the United States, made up principally of Latinos, Asians and Africans, there has been a growing demand for products that are popular in their countries of origin. In order to meet this demand, there has been a tremendous increase in imports of agricultural products to the United States. Cassava is a good example. Imports of cassava to the US have increased 370% in the last six years. The University of Massachusetts began to evaluate vegetable crops popular among Puerto Ricans and Dominicans in 1996, and in 2002 began to evaluate crops popular among the large and growing Brazilian population in the state and region. This paper summarizes results of research on crops popular with Brazilian immigrants in the US, in addition to the evaluation of the marketing chain and impact of media outlets to promote and sell these crops. Surveys of Brazilian customers in target markets demonstrated that the majority of Brazilian immigrants in the Northeastern United States are from the state of Minas Gerais. Due to this fact, the crops chosen for research in Massachusetts were ones that were popular in this state: jiló, maxixe, taioba, abóbora and okra. In order to successfully introduce these crops into the marketplace it is critical to devote resources to promotion and marketing. In spite of their popularity among Brazilians, these vegetable crops are not normally found in the market so it is necessary to let the community know that they are available and in what locations. The most effective media outlet evaluated in this work to reach Brazilians was the television station Rede Globo International, available in the United States; however, other avenues evaluated to promote this project to Brazilians, such as Brazilian newspapers and radio programs, were also effective and less expensive. The opportunity to export agricultural products to the United States is a growing opportunity for farmers in Brazil. In order to gain access to this market it is important to understand the distribution system used for fresh produce in the United States.

**Keywords:** Taioba, jiló, maxixe, abóbora.

### RESUMO

#### Produção e marketing de hortaliças para os mercados étnicos nos Estados Unidos

Devido ao crescente número de imigrantes nos EUA, composto por latinos, brasileiros, asiáticos e africanos, observou-se um aumento no interesse dessas comunidades em obter produtos que são comuns em seus países de origem. Para atender essa demanda houve um aumento nas importações de produtos étnicos e na produção interna dessas hortaliças. A mandioca é um bom exemplo do interesse em cultivos étnicos. As importações desse produto cresceram 370% nos últimos seis anos. A Universidade de Massachusetts iniciou suas pesquisas em 1996 com culturas populares entre os imigrantes de Porto Rico e República Dominicana e, em 2002, com os vegetais presentes na culinária brasileira. Este trabalho sumariza as informações disponíveis atualmente em relação às necessidades dos imigrantes brasileiros em termos de hortaliças de cunho cultural, identifica as cadeias fornecedoras existentes, explica os impactos da mídia sobre o mercado étnico e descreve as práticas de aquisição de produtos específicos demandados pelos consumidores brasileiros. Pesquisas mostraram que a maioria dos imigrantes brasileiros eram provenientes do estado de Minas Gerais e devido a esse fator, as culturas escolhidas foram jiló, maxixe, taioba, abóbora e quiabo. Para a introdução dos produtos no mercado é necessário focar grande parte das atenções no marketing e divulgação. Apesar de existir uma demanda, esses vegetais não são normalmente encontrados nos mercados, sendo necessário informar onde e quais produtos estão disponíveis. O melhor meio de divulgação entre os brasileiros é através da emissora de TV Rede Globo, porém outros meios como jornais e rádios em língua portuguesa são eficientes e mais acessíveis. A exportação de produtos étnicos para os EUA é um mercado crescente, porém para entrar nesse mercado é necessário compreender a cadeia de distribuição de vegetais frescos nos EUA. Além disso, os donos das grandes cadeias de supermercados desconhecem os vegetais étnicos, sendo muitas vezes uma barreira para a comercialização dos mesmos.

**Palavras-chave:** Taioba, jiló, maxixe, abóbora.

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The demographics of the United States are changing rapidly as immigrant populations increase at rates not seen since the early 20<sup>th</sup> century. In 2005, 7.9 million immigrants came to

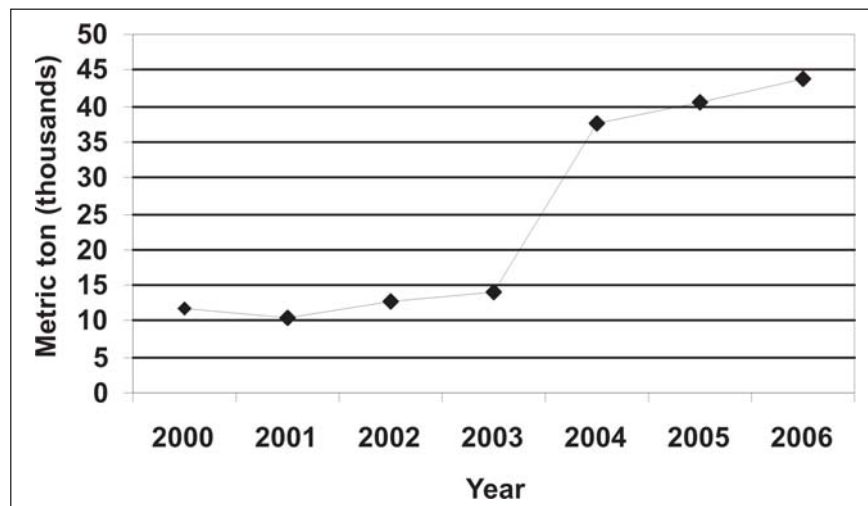
the United States, the largest number in a single year of the U.S. history. According to the U.S. Census Bureau, the U.S. Hispanic population was about 38 million in 2003 and expected to jump

to 49 million by 2015. The Asian population was estimated at 12 million in 2003 and expected to grow to over 17 million by 2015 (Bushnell, 2004). The Brazilian government estimates that

there are 1.5 million Brazilians living in the U.S., both legal and illegal (The New York Times, 2005). The major concentrations of Brazilians in the U.S. are in Massachusetts, New York, New Jersey, Florida, and California.

Massachusetts in particular has experienced a strong surge of immigrants in recent years. According to 2005 Census estimates, Hispanics are the largest ethnic minority in the state with 8% of the population, outnumbering African-Americans (7%). Asians represent 5% of the total population and their numbers are increasing (Abraham, 2006). Forty percent of the population in southeastern Massachusetts is of Portuguese and Cape Verdean backgrounds. About 150,000 Brazilians live in greater Boston and Cape Cod, making Portuguese the second most spoken language in Massachusetts, according to the U.S. Census (Rapoza, 2000). The Brazilian Consulate in Boston and the Brazilian Immigrant Center in Allston, MA, estimate there are at least 250,000 Brazilians living in the state (The Boston Globe, 2006).

The dramatic increase in immigrant populations has had a significant effect in the U.S. marketplace, especially for fresh fruit and vegetable markets. In 2002, Hispanics, Asian-Americans, and African-Americans represented 31% of the U.S. population, yet they accounted for 37% of all sales in supermarkets (Grow with America, 2002). In 2006, Hispanics had a buying power of \$798 billion. This figure is expected to reach \$1.2 trillion by 2011, accounting for 9.5% of all U.S. buying power (Humphreys, 2006). In Hispanic grocery stores, 22% of total sales (over twice the national average) come from the produce department (Produce Marketing Association, 2006). The immigrant groups represented in Massachusetts desire to purchase what is part of their culture and readily available in their countries of origin. Historically, these items have rarely been available in U.S. markets, if they were available at all. But recently, vendors have been providing them with greater frequency by importing produce from outside the U.S. or buying



**Figure 1.** Total imports of cassava to the United States (total das importações de mandioca para os Estados Unidos). Amherst, University of Massachusetts, 2007.

Source: Data adopted from *Yucca (cassava) reports* (Fruit and Vegetable Market News, 2007).

domestically produced goods. To date, most of the demand has been met with imports. The history of cassava production and imports to the U.S. is illustrative.

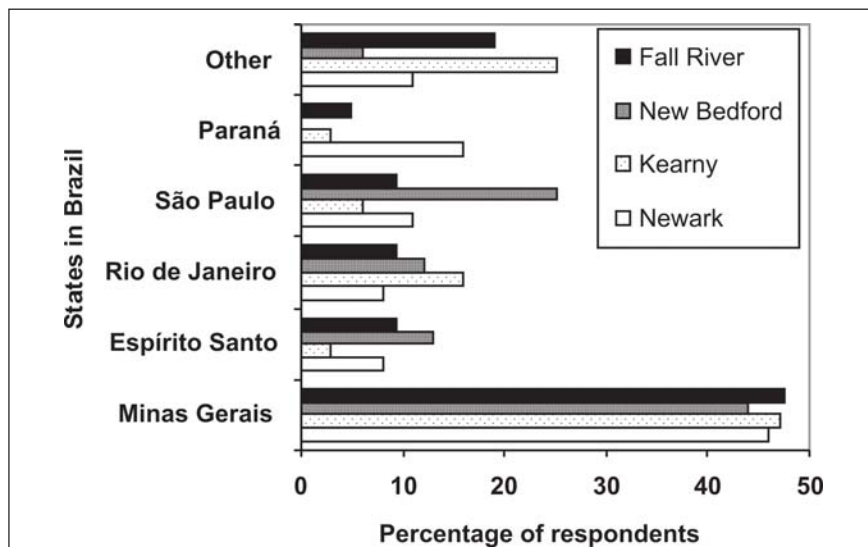
**Cassava in U.S.** - Cassava (*Manihot esculenta*) is one of the most important root crops in the world and is very well adapted to extreme conditions of weather and soil types found in the tropics and sub-tropics. The root is an important source of carbohydrates to over 600 million people in countries where it is produced. In addition, the plant is rich in protein, vitamin A and C, and others nutrients (Fukuda, 2005). In Brazil, the center of origin for this crop and the largest producer in the world, the leaves are also used in several dishes such as *maniçoba*, in which minced cassava leaves are cooked with meats. Also, processed cassava leaves have been used in programs to fight hunger and undernourishment in Brazil. According to Instituto Brasileiro de Geografia e Estatística (IBGE, 2007), Brazil produced almost 28 million metric tons of cassava in 2005; almost two million hectares were harvested in this same year, with an average yield of almost 15 t ha<sup>-1</sup>.

In Brazil there are two categories of cassava. One is called sweet or *mesa* (table) cassava, which is used for human and animal consumption. In Portuguese, varieties in this category are called *aipim*, *macaxeira* or *mandioca*,

depending on the region of the country. The second type of cassava is referred to as bitter or *mandioca brava* (wild cassava) and is used in industry (Embrapa, 2007). In general, varieties with yellow roots are preferred for human consumption and those with white roots are used for processing flour (Fukuda, 2005).

For human consumption, the roots of cassava varieties should have less than 100 ppm of hydrocyanic acid (HCN). The quantity of HCN can vary greatly among varieties, and also with the physiological stage of the crop and the environmental conditions where they are grown. Characteristics used by consumers when buying cassava varieties are the absence of fibers when cooked, the length of time to cook, post-harvest disease resistance, and the size and ease of peeling the roots (Embrapa, 2007). Many cassava varieties are adapted for specific environments and good yields achieved in one region will not be reproduced in others. Most pests of cassava are associated with specific environments, which is the main reason for the large number of cassava varieties used by the growers in Brazil (Embrapa, 2007).

In 2000, the first year the USDA began tracking the imports of cassava, over 10,000 metric tons were imported into the U.S. This amount has risen to almost 45,000 metric tons in 2006 (Figure 1). Cassava is imported almost exclusively from countries in Latin



**Figure 2.** States of origin of Brazilian immigrants living in Massachusetts and New Jersey (estados de origem de imigrantes brasileiros que vivem em Massachusetts e New Jersey). Amherst, University of Massachusetts, 2007.

Survey conducted with 105 Brazilians at two stores in Massachusetts (Fall River and New Bedford) and two stores in New Jersey (Newark and Kearny) in 2006. (Pesquisa realizada com brasileiros em dois supermercados em Massachusetts (Fall River e New Bedford) e dois em New Jersey (Newark e Kearny) em 2006).

America. The increase in cassava imports is not only due to increased market demand, but also decreased domestic production. Cassava production was in excess of 400 hectares in Southern Florida in the early 1980's, but production decreased dramatically because of quality issues and the lower cost of production in Latin American countries. In 2006, less than 15 hectares of cassava were estimated to be in production in Florida (Lamberts, 2007; personal communication).

**The research on vegetables to ethnic markets at the University of Massachusetts** - Most of the vegetable crops popular in the countries of origin of recent immigrants to Massachusetts can be grown in the Northeastern U.S. More than 70% of the almost 9,000 hectares of vegetables grown in Massachusetts are crops that have their center of origin in tropical and subtropical climates, such as sweet corn (*Zea mays*), pumpkins and squash (*Cucurbita spp.*), peppers (*Capsicum spp.*), and tomatoes (*Solanum lycopersicum*) (USDA National Agricultural Statistics Service, 2002). There are very few vegetable crop species that cannot be grown in the Northeastern U.S.

The demographic changes in Massachusetts and growing conditions

in the state and region create a large marketing opportunity for domestic growers. Researchers from the University of Massachusetts (UMass) have been investigating cultural requirements and market conditions for vegetable crops used by the growing immigrant population in the state and region. Research began in 1996 with crops popular among Puerto Ricans and Dominicans, and has expanded subsequently into vegetable crops popular among other Latino groups, Asians, and Brazilians. Due to this research there are currently commercial farmers in Massachusetts growing vegetable crops desired by these growing immigrant groups. Examples are calabaza (*Cucurbita moschata*), ají dulce (*Capsicum chinense*), and water spinach (*Ipomoea aquatica*) (Rulevich et al., 2003; Casey et al., 2004; Mangan & Bunnell, 2004).

In order to meet the regional demand for crops by immigrant populations, it is also necessary to understand existing supply chains and their requirements, and consumer behavior. In addition to research in Massachusetts, comparison consumer surveys were conducted in New Jersey, another state with a high influx of immigrants. This paper summarizes information available to

date on cultural requirements of crops important to Brazilian immigrants in Massachusetts, categorizes current supply chains, explains the impacts of ethnic media, and describes purchasing practices for target crops in demand by Brazilian consumers.

**Brazilian crops investigated for Massachusetts production** - Beginning in 2002, research and extension activities at UMass have focused on crops popular with the Brazilian population in the state and region. Surveys implemented by UMass researchers with Brazilian consumers in markets in Massachusetts and New Jersey have shown the dominance of consumers from states in Southeastern Brazil, Minas Gerais in particular (Figure 2). For this reason the focus of investigation has been vegetable crops popular in these states, such as scarlet eggplant (*Solanum gilo* Raddi; in Portuguese, *jiló*), West Indian gherkin (*Cucumis anguria*; in Portuguese, *maxixe*), squash and pumpkin (*Cucurbita spp.*), tannia (*Xanthosoma sagittifolium*; in Portuguese, *taioba*), and okra (*Albemoschus esculentus* (L.) Moench; in Portuguese, *quiabo*).

The scarlet eggplant is an annual tropical vegetable that is very sensitive to cool temperatures and can be planted year-round in regions with very mild winters. This bush-like plant produces clusters of 2 to 4 fruits. Scarlet eggplant cultivars used in Brazil range from slightly to extremely bitter and have yields as high as 40 metric t ha<sup>-1</sup>. Varieties can produce fruit that are round (cultivar *Verde Redondo*), oblong (cultivar *Morro Grande*) or elongated (cultivar *Comprido Cachoeira*). The scarlet eggplant is harvested and sold when it is immature (green), with weights ranging from 20 to 50 g fruit<sup>-1</sup> (PESAGRO/RJ, 2001, cited by Torres et al., 2003). Filgueira (2000) cites that the yields of the cultivars *Tinguá*, *Comprida Grande Rio* and *Morro Grande* can vary greatly, from 30 to 70 t ha<sup>-1</sup>. According to Instituto Brasileiro de Geografia e Estatística (IBGE, 2007), the largest production of scarlet eggplant are in the states of Minas Gerais, Rio de Janeiro, São Paulo, Espírito Santo, Bahia, and Goiás, representing 85% of

the national production of 58,300 t in 1996. Due to the large volume of intercellular gases, the scarlet eggplant is very resistant to mechanical injury during harvesting and packing. The scarlet eggplant should be stored between 10 and 13°C with relative humidity greater than 95%. The scarlet eggplant is very sensitive to water loss, which can be reduced when stored in perforated plastic bags or when fruits are waxed (Calbo, 2007).

The scarlet eggplant is used several ways in Brazilian cuisine, including as an accompaniment in main dishes, in soups and fried. In Southeastern Brazil, it is common in bars and restaurants to use the scarlet eggplant as a way to take away the taste of strong alcoholic beverages (*tira-gosto*). This is considered a good alternative to other dishes that traditionally are used in bars, such as pork rind (in Portuguese, *torresmo*), sausages and sardines, all of which are normally fried in oil. In rural areas of Brazil, where it is also known as *jinjilo*, the scarlet eggplant is also used in a home remedy as an ingredient in a preparation of tonics for influenza, colds, and fevers (Kurozawa, 2007).

Okra is a traditional vegetable in the Malvaceae family cultivated in Africa, India, Asia, The United States, Turkey, Brazil, among many other countries (Duzyaman, 1997). In Brazil, okra is an important ingredient in many traditional regional dishes, including the use as a sacred food in religious festivals such as *caruru* (okra cooked with dried shrimp), the principal food offered to saints in the state of Bahia. Okra is also very important in the traditional cuisine in the state of Minas Gerais, where it is used with chicken (*frango com quiabo*) and beef (*refogado de carne com quiabo*). It is prepared in many different ways, including steamed, fried, boiled and grilled; okra is also thought to have medicinal qualities in the treatment of digestive system diseases (Programa, 2007). The fruits of okra grown in Brazil are elongated and cylindrical in shape, dark-green to light-green in color with a point at the tip that is sometimes slightly curved. Fruits for human consumption are harvested immature, and should be picked 4 to 10 days after

flowering, when the fruit is between 10 and 14 cm in length. At this stage, the tip of the fruit is easily snapped with fingers, which is a sign of freshness. When the fruit reaches maturity, they become very fibrous, hard and dry, and the color turns slightly yellow (Kurozawa, 2007). The most important cultivars grown in Brazil are *Santa Cruz 47*, *Amarelinho*, *Campinas II*, *Esmeralda*, *Chifre-de-veado*, *Colhebem*, and *Roxo* (Kurozawa, 2007). Best yields are achieved with warm temperatures, well-drained soils with high levels of organic matter, and adequate fertility.

Okra is grown throughout Brazil, including in home gardens. According to the Agricultural Census of Instituto Brasileiro de Geografia e Estatística (IBGE, 2007), in 1996 the leading states of production were Minas Gerais, São Paulo, Sergipe, Rio de Janeiro, Espírito Santo, Bahia, and Goiás, representing 85% of the national production of 87,400 t. Yields in Brazil range from 20 to 40 t ha<sup>-1</sup>. Yields vary due to factors such as cultivar selection, soil type, climate, soil fertility, availability of water, and pest management practices.

Maxixe (West Indian gherkin) belongs to the cucurbit family and was brought to Brazil from Africa during the slave trade. It is most popular in the Northeastern states of Brazil where it is consumed boiled, fried, stewed or used fresh in salads. Its harvest extends up to 60 days with yields varying from 4 to 16 t ha<sup>-1</sup>. Modolo (2003) estimated yields of almost 52 t ha<sup>-1</sup> when planted in beds covered with polyethylene plastic with trickle irrigation. In addition to *C. anguria* (*maxixe comum*) another species, *C. longipes*, is also used by commercial farmers. A hybrid cultivar has been developed by crossing *C. longipes* and cultivars of *C. anguria* (Koch & Costa, 1991). The fruits of *maxixe*, which are about the size and shape of a chicken egg, can have either supple spines or smooth skin and are pale green in color.

Tannia (*taioba*) is a perennial leafy vegetable crop that belongs to the family Araceae and originated from the Tropical Americas (Rubatzky, 1997). It is traditionally consumed in the states

of Minas Gerais, Bahia, and Rio de Janeiro, among others. There is a growing interest in this crop due to its nutritional qualities, which are superior to spinach, and its unique flavor (Pinto, 1999). There are several varieties being commercially grown in Brazil, among them is *Common taioba* (dark green leaves with green petiole), *Purple taioba* (dark green leaves with purple petiole), and the BGH/UFV 5932 (light green leaves and green petiole). The yield of leaves ranges from 10 to 25 t ha<sup>-1</sup> during a harvest period which can last for up to 9 months depending on the region in Brazil where it is grown.

**Categories of businesses that sell fresh produce to Brazilians in Massachusetts** - Massachusetts has more than 1,000 Brazilian-owned businesses. These include small markets, restaurants, butcher shops, clothing stores, bakeries, and travel agencies, among others (Costa, 2007; personal communication). It is estimated that there are approximately 300 Brazilian stores that carry at least some fresh produce in Massachusetts (Farias, 2007; personal communication). In addition, there are non-Brazilian owned businesses (i.e. wholesale distributors, traditional supermarket chains, and farmers' markets) that carry Brazilian products and locally-grown Brazilian produce. Figure 3 shows these businesses in the supply chain and their connections as well as how Brazilian consumers are getting fresh produce. It is estimated that the most important source of fresh fruits and vegetables for Brazilians in Massachusetts are traditional supermarket chains. However, the overwhelming majority of fresh fruits and vegetables that are consumed by Brazilians in the state of Massachusetts are being produced outside the State. A central player in the distribution of fresh fruits and vegetables to all markets is the Terminal Wholesale Market in Chelsea, MA. Except for farmers' markets, the vendors based in the terminal market supply fresh produce to all of the businesses categories.

**Category 1: Farmers' markets** - There were over 120 farmers' markets in Massachusetts in 2006. Annual sales at these farmers' markets are estimated

to be over USD \$20,000,000 annually (Cole, 2007). In Massachusetts, all agricultural products sold at farmers' markets have to be produced in the state. Given the large number of Brazilians in the State, there are opportunities for farmers to draw these customers to farmers' markets by providing fruits and vegetables used in their cuisine.

**Category 2: Brazilian restaurants**

- There are more than 100 Brazilian-owned restaurants in Massachusetts (Vitorino, 2007; personal communication). The majority of these restaurants get their fresh fruits and vegetables from the Terminal Wholesale Market in Chelsea, MA (described below), either by buying directly or hiring jobbers that buy for them. Some restaurants will buy certain locally-grown vegetables that are popular in their cuisine and difficult to get wholesale directly from farmers. An example is the scarlet eggplant, a vegetable very popular in Brazilian cuisine, which at times is difficult to get through traditional channels. A very small amount of fresh produce, however, is bought directly from farms.

**Category 3: Brazilian small markets**

- The approximately 300 small Brazilian stores in Massachusetts that carry specific products used by Brazilians on a regular basis and are located in areas with large concentrations of Brazilians. These stores carry a range of products that can vary tremendously from store to store and include Brazilian CDs and DVDs, cosmetics, clothing, and canned products, such as drinks, rice, beans, and other processed products. A high percentage of the products in their inventory are from Brazil. Frequently there is a butcher shop or a bakery. Fresh meats are a very important part of the Brazilian cuisine, and the cuts preferred are different than those found in traditional U.S. butcher shops. There are also types of bakery goods that are unique to Brazilian culture and not found in mainstream U.S. stores. The amount of fresh produce carried by these stores varies greatly and usually focuses on items highly desired by their clientele. Stores in this category carry fresh produce popular among Brazilians that do not require cooling facilities (e.g.

onions, hard squashes, cassava). Some stores have more advanced cooling facilities and will carry a range of produce with shorter post-harvest lives (e.g. collards, scarlet eggplant). As with Brazilian restaurants, stores in this category get the majority of their produce from the Terminal Wholesale Market in Chelsea, either directly or from independent distributors (jobbers). Some wholesale companies based at the terminal market will deliver to individual stores for a service fee.

**Category 4: "Ethnic" supermarket chains**

- There are two "ethnic" supermarket chains in Massachusetts that carry Brazilian products. One is Brazilian-owned and caters directly to this community. It has four stores located in cities with large Brazilian populations: Framingham, Somerville, Hyannis, and Shrewsbury. Each store carries a large inventory of processed products along with a meat department and a bakery, similar to the Brazilian small markets. The stores have larger produce sections than those markets, including fresh fruits and vegetables used in the Brazilian cuisine. The majority of the produce comes from the Terminal Wholesale Market in Chelsea MA. Kaufman et al. (2000) described a "chain" store as "operating 10 or more stores or outlets". This business with only four stores would not fit their definition; however, for the purposes of this study we consider this a chain store in order to differentiate it from "small markets" in which one individual has control over sales. Kaufman et al. (2000) would refer to this business as an "Independent owned retail-store".

The second "ethnic" supermarket is a Portuguese-owned chain with 17 stores in four states: New Jersey, Rhode Island, Massachusetts, and Florida. Traditionally these stores were located in areas with large Portuguese communities, but they are now expanding into areas with other immigrant and traditional customers. They currently have four stores in Massachusetts in the following cities: New Bedford, Fall River, Swansea, and Attleboro. Because of the large and growing Brazilian populations in many of the cities where these stores are

located, the amount of Brazilian products carried by these stores has increased dramatically. The percentage of Brazilian clientele at the 17 stores varies widely, ranging from as low as 5% to as high as 90% (Cadima, 2006; personal communication). The chain has a main warehouse for fresh produce located in Newark, NJ, but also has warehouses in other states, including Massachusetts. They order their fresh produce from many sources, including terminal markets in New York and Miami. They will also buy directly from farmers.

**Category 5: "Traditional" supermarket chains**

- There are at least 10 "traditional" supermarket chains with stores in Massachusetts that are important sources of fresh fruits and vegetables for immigrant groups, including Brazilians. One supermarket chain, with 59 stores in Massachusetts and New Hampshire, has actively targeted these growing immigrant communities by offering many products, both fresh and processed, desired by these groups. Many of these stores have aisles with signs such as "Ethnic", "Mexican", "Asian", and "Brazilian" where they sell processed products used by these groups. This supermarket chain carries a line of Brazilian non-perishable food products (e.g. drinks, flour, candies) and frozen foods (e.g. okra, cassava) popular among Brazilians. The produce manager of one store estimated that Brazilians make up 40% of their customer base. This chain has a central warehouse from which the majority of the fresh produce is distributed to all their stores. The warehouse receives deliveries from farms, local and outside the State, and from brokers throughout the country. Only what they call "tropical products" such as cassava and bananas are delivered to individual stores from the Terminal Wholesale Market in Chelsea (Shea, 2007; personal communication).

**Category 6: Wholesale-retail fruit and vegetable markets**

- This category describes larger independent markets that carry significant amounts of fresh fruits and vegetables that are not chain stores and have a significant ethnic customer base. Kaufman et al. (2000)

would refer to a store of this nature as a “green grocer”, in which at least 50% of the sales are from fresh produce. Stores in this category function as both retail and wholesale operations. They have a retail space but also sell fresh produce to independent businesses, ranging from restaurants to farm stands. In season, stores studied as part of this work buy a significant amount of their fresh produce from local farmers. These stores also get a significant amount of their fresh produce from other markets when not buying local. These include the Terminal Wholesale Market in Chelsea and other terminal markets and brokers outside the State.

**Category 7: Jobbers** - These are small to medium size wholesale operations that buy products from larger wholesale operations and deliver them to retail businesses (Kaufman et al., 2000). The largest source of fresh fruit and vegetables for these businesses are the Terminal Wholesale Market in Chelsea, MA. One jobber company interviewed is Brazilian-owned and has over 30 accounts in Massachusetts, mostly made up of restaurants and small stores. Another term used at the Terminal Wholesale Market for people in this category is “peddlers”.

**Category 8: Terminal wholesale market in Chelsea MA** - The New England Produce Center and the Boston Market Terminal, together referred to by many as “Chelsea Market”, since it is located in Chelsea, MA, play an important role for many farming operations in the State and region. The terminal market focuses on independent retailers and food service accounts (Cook, 2001). Many farms in Massachusetts sell wholesale to Chelsea Market, but with the growth of farm stands in recent years, many local growers buy fresh produce from the Chelsea Market to augment their own produce sold at their farm stands. The Terminal Wholesale Market in Chelsea is a major source of fresh fruits and vegetables, either directly or indirectly, in all the categories described above, except for farmers’ markets. One growth area at the terminal market is fresh fruits and vegetables popular among the growing immigrant populations,

especially Hispanic and Asian produce (Mangan, 2005).

**Effects of ethnic media for promotion and marketing** - According to the U.S. census, the percent of people five-year old and over who speak a language other than English at home increased from 18.3% in 2002 to 19.4% in 2005. The rates are slightly higher in Massachusetts, from 18.7% in 2002 to 20.3% in 2005. Spanish-speakers are the largest group, with 12% in the United States. As the non-English speaking populations have grown in the United States so have media outlets serving these communities. It is estimated that 51 million Americans, 24% of the adult population, are either primary or secondary consumers of ethnic media (Project for Excellence in Journalism, 2006).

While mainstream print media is experiencing a downturn in readership, Hispanic media outlets are experiencing strong growth. Hispanic daily newspaper circulation rose from less than 200,000 in 1970 to over 1.6 million in 2005. Advertising dollars have increased in a similar trend to circulation, and were estimated to be \$ 996 million in all ethnic media in 2005 (Project For Excellence in Journalism, 2007). As a specific example, in 2003, Bank of America Corp., the third largest bank in the U.S., initiated a \$50 million multicultural advertising campaign. The campaign, which represented 25% of the total marketing budget for that year, included advertisements in ethnic media in several languages, including \$13 million for Spanish-language television advertising (Talcott, 2004).

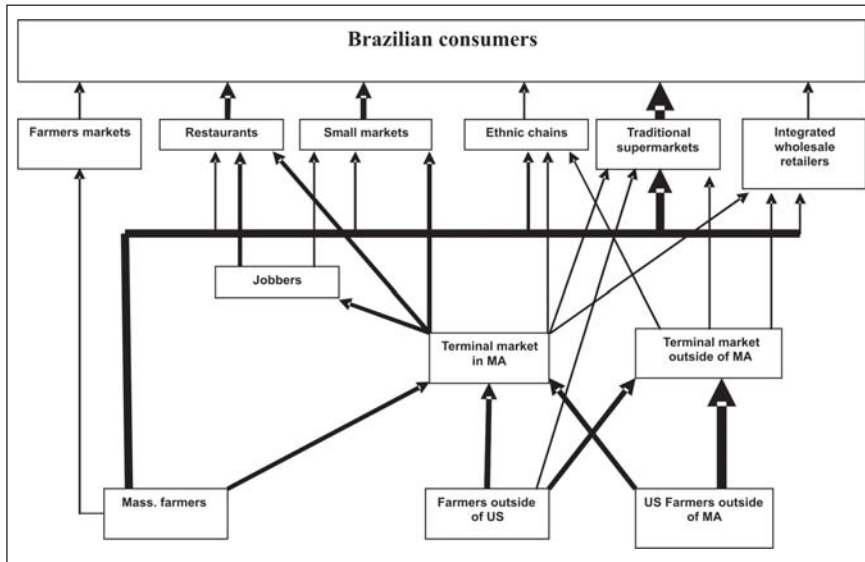
The Brazilian community in Massachusetts also makes great use of media specifically targeting their community. Perhaps the most important media outlet is the television station *Rede Globo*, which is the largest television station in Brazil and the third most watched station in the world with 80 million people tuning in daily. The international channel of *Rede Globo*, which is available in 66 countries in 5 continents, reaches 5.5 million people outside of Brazil (TV Globo Internacional, 2007). In the U.S., *Rede Globo* was first offered by dish network and now is also available from Comcast,

the largest cable company in United States. A second Brazilian television station is now available in the U.S., called *Rede Record* (Rede Record Internacional, 2007).

In 2004, a 30-second commercial was commissioned by researchers at University of Massachusetts to run on *Rede Globo* in order to promote the availability of Brazilian vegetables grown in Massachusetts for local markets. The vegetables highlighted in the commercial included the scarlet eggplant, *maxixe*, and an okra variety popular in Brazil. A phone number and email address were included in the commercial to allow people to get more information on the availability of these crops. Over 120 phone calls and emails were received from Brazilians desiring these products, demonstrating the impact of the commercial. A focus of the commercial was to emphasize the fact that these vegetables were grown locally and the seed was obtained from Brazil, confirming their authenticity. Many Brazilians contacting project personnel via email and phone relayed their excitement about being able to buy these vegetables in the U.S. for the first time.

In this same year project personnel from UMass were interviewed on a popular TV show on *Rede Globo Internacional, Planeta Brasil*, about local farmers growing Brazilian vegetables and local markets that were carrying them. This is one of the few shows on *Rede Globo* that is not produced in Brazil and focuses on stories of interest among Brazilians living outside of Brazil, in particular in the United States. Both the commercial and the segment on *Planeta Brasil* played an important role in promoting the sales of these vegetables, not only in 2004 but in subsequent years. During the interviews with consumers many Brazilians mentioned that they had seen the commercial and segment on *Planeta Brasil*.

In May of 2006, an event was organized by UMass personnel to evaluate the sales potential for vegetable transplants that can be sold as bedding plants to the Brazilian community. Specific vegetable transplants were



**Figure 3.** Supply chain for fresh produce used by Brazilians in Massachusetts - Line thickness of arrows varies according to estimates of product flows (cadeia de abastecimento de produtos frescos utilizados por brasileiros em Massachusetts – a espessura das linhas varia de acordo com a estimativa do fluxo de produtos). Amherst, University of Massachusetts, 2007. Source: interviews with wholesale and retail managers of traditional and ethnic chains, small markets and restaurant owners, jobbers, farmers and consumers (fonte: entrevistas com gerentes de atacadistas e de redes varejistas tradicionais e étnicas, donos de pequenos mercados e restaurantes, atravessadores, produtores e consumidores).

produced and brought to the market. These included transplants of *maxixe*, *taioaba*, and okra. To promote the event, an article was published in a Brazilian newspaper called *Brazilian Voice* based in Newark, NJ, because the store manager recommended this newspaper as the most popular one among the Brazilians in Newark. During the course of the event, in person interviews were conducted with 30 Brazilians and results showed that 47% of the respondents saw the article in the Brazilian newspaper. This newspaper is written exclusively in Portuguese. Other examples of Brazilian newspapers produced in the United States that are exclusively in Portuguese are: *a Notícia*, Metropolitan, Brazilian Press, and National Brazilian Newspaper. They are all free and are available in the majority of the 1,000 Brazilian stores in Massachusetts.

**Purchasing habits for Brazilian vegetables in the U.S.** - Before farmers' devote valuable land and resources to produce new crops it is critical that they understand the size of the market for the specific crops. UMass researchers implement surveys with target consumers to ascertain food habits for the target crops. As an example, surveys

were implemented with Brazilian consumers living in the United States about their purchasing habits for *maxixe* while they were living in Brazil since this vegetable was not available fresh in the U.S.

More than 40% of consumers bought at least 1 kg (2.2 lbs) per week of *maxixe* while living in Brazil (figure 4). There was a strong relationship between the amount purchased and the state of origin in Brazil. Brazilians from states in Brazil where this vegetable is more popular had a tendency to buy more. More than 10% of those surveyed did not know what *maxixe* was, since they came from states where it is not part of the local cuisine (data on states of origin not shown). For those consumers that bought *maxixe* in Brazil, they were asked if they used any fresh vegetables available in the U.S. as substitutes for *maxixe*. Forty-two percent of those surveyed said that there were no substitutes for *maxixe* (data not shown), indicating its uniqueness to some consumers. However, 54% of those surveyed said that they buy cucumbers as a substitute. Four percent of customers said that they bought scarlet eggplant and okra as substitutes, probably since they are both used in a

Brazilian dish called *cozido*, which also has *maxixe* as a key ingredient. Due to the results of these surveys, commercial farmers in Massachusetts are producing *maxixe* for the first time in 2007.

**Final remarks** - The large and growing Brazilian population in Massachusetts has a strong preference for their traditional cuisine, and this represents a market with strong potential for local producers. In order for local farmers to fully take advantage of these opportunities, it is critical that they understand the market demand for the specific products and the distribution system used by the markets that sell these products. The terminal wholesale market in Chelsea, MA is a dominant distribution point for most of the retail markets that cater to Brazilians (Figure 3). This is especially true for small Brazilian stores and restaurants, which represent over 300 markets in the state. Most of these 300 businesses sell relatively small amounts of fresh produce per week, and therefore, it is not practical for local farmers to deliver to individual stores. Instead, it would be more efficient to sell the produce to vendors at the terminal market where these smaller stores buy their produce.

It is important that local farmers understand the difference between Brazilian-owned and non-Brazilian owned businesses. The owners of Brazilian-owned businesses are very knowledgeable about the fresh fruits and vegetables desired by their clientele and are in a position to promote them to their customers. The use of point-of-sales materials and other types of promotion are not as critical with these smaller Brazilian-owned stores since the employees of the stores can promote the products themselves.

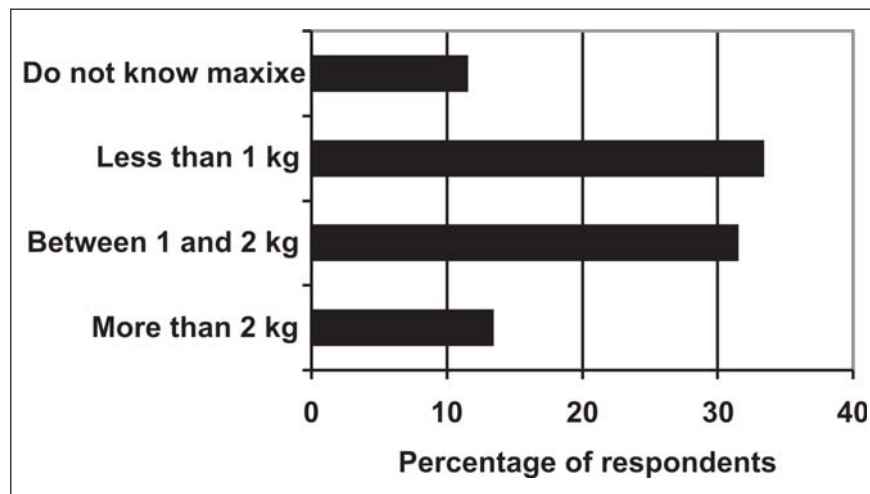
Managers of supermarket chain stores understand the changes in their marketplace due to the growth of immigrant populations and are eager to offer fresh produce that is desired by these groups; however, they need to be educated about the specific crops desired by these groups and what the market potential for them is before they will buy them. It is critical to have staff that understands the language and the culture of the target ethnic group in order

to implement a market analysis of the specific products to be assessed. In the case of the market analysis of the hybrid squash and *maxixe* in this study, Portuguese-speaking survey takers were essential, since the majority of consumers interviewed were Portuguese-dominant. In addition to linguistic reasons, there were cultural considerations. A large percentage of the Brazilian population in Massachusetts is undocumented and the fact that project personnel implementing the surveys were Brazilian and spoke Portuguese made interviewees more comfortable to take the survey.

An understanding of the importance and power of ethnic media outlets is critical to maximize the sales of target products. Brazilian newspapers and cable TV are important sources of information for the consumers in this study, and articles and programming on Brazilian TV promoting locally-grown vegetables had a tremendous impact on sales. These newspapers and locally-produced TV programs are hungry for stories that highlight products desired by their audience, in particular ones that they did not know could be produced locally. It was very easy to get Brazilian-owned newspapers to produce articles about the availability of the locally-grown vegetables that were used in this research.

The importance of promoting these crops in the marketplace with personnel who speak the language (Portuguese) and understand the culture and cuisine of Brazil cannot be underestimated. Brazilian and Portuguese-speaking project personnel were able to draft articles in Portuguese for the newspapers targeted in this work and also able to produce point-of-sales materials in Portuguese that resonated with Brazilians store owners and customers. In addition, some store owners and managers were Portuguese-dominant, or in some cases spoke little or no English, so having personnel who spoke Portuguese was essential.

Farmers rightfully see the introduction of new crops as a challenge, beginning with the availability of seeds in the U.S. to the different production practices that they must learn in order



**Figure 4.** Amount of maxixe purchased weekly by Brazilian consumers when living in Brazil (quantidade de maxixe adquirida semanalmente por brasileiros enquanto viviam no Brasil). Amherst, University of Massachusetts, 2007.

Source: Survey conducted with 105 Brazilians at two stores in Massachusetts (Fall River and New Bedford) and two stores in New Jersey (Newark and Kearny), in 2006 (pesquisa realizada com 105 brasileiros em dois supermercados em Massachusetts (Fall River e New Bedford) e dois em New Jersey (Newark e Kearny) em 2006).

to grow them successfully. There can also be considerable risk in growing new crops without a thorough understanding of their market potential. It is essential that the farmers understand the market demand for a specific crop, and the distribution system used to deliver the crops to the consumer, before planting the seed.

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