

Opportunities in the Fresh-Cut Fruit Sector for Indiana Melon Growers



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In his 1916 novel, *A Hoosier Holiday*, Theodore Dreiser described the southwest region of Indiana as:

fields so rich and warm and moist that they were given over almost entirely to the growing of melons—water and cantaloupe, great far flung stretches of fields. Large, deep-bodied, green painted wagons came creaking by, four, five, and six in a row, hauling melons to the nearest siding where there were cars. Here were melon packing sheds to be seen here and there, where muskmelons were being labeled and crafted. It was lovely.

To this day, the sandy soils in southwest Indiana are used for the production of eastern-type muskmelons (see Cantaloupe—A Common Misnomer) and watermelons, which have become an integral part of the agricultural economy of Indiana. This publication provides an overview of the fresh-cut produce industry and of the melon industry in Indiana and discusses available opportunities for Indiana melon growers in the fresh-cut fruit industry.

Cantaloupe—A Common Misnomer

The terms “cantaloupe” and “muskmelon” are often used interchangeably when referring to the *Cucumis melo* L. (Reticulatus Group) plant. True cantaloupes are seldom grown in the United States. True cantaloupes belong to the Cantaloupensis Group, have a non-netted rind, and are commonly grown in Cantaluppi, Italy. Muskmelons, on the other hand, are grown in the United States and have a netted rind.

In the U.S., there are two different types of muskmelons: eastern and western. The eastern-type muskmelons have prominent ribs or sutures, often covered with dense netting. Characteristic of this type of melon are high sugar content and musky flavor. Eastern-type

melons are grown in the eastern part of the U.S. and in such states as Indiana, Kentucky, and Michigan during the summer months and are used primarily for local consumption.

Western-type melons have no ribs or sutures and usually have lower sugar content than the eastern types. This type of melon is grown domestically in Arizona, California, and Texas, and accounts for 80% of total muskmelon production in the U.S. Due to longer shelf life and good transportation handling, western-type melons can be distributed from the West Coast to the eastern states and can be imported from Mexico and Central America during the winter months.

U.S. Fresh-Cut Produce Industry

Fresh-cut produce includes items such as bagged specialty salads, baby carrots, stir-fry vegetable mixes, and fresh-cut melons, and extends to include all types of fruits and vegetables in a variety of different cuts, packages, and mixes for consumption. Fresh-cut produce has been defined by the International Fresh-Cut Produce Association (IFPA) as: “any fresh fruit or vegetable that has been physically altered from its original form (by peeling, trimming, washing, and cutting) to obtain a 100% usable product that is subsequently bagged or prepackaged.” An important criterion for a fruit or vegetable to be considered a “fresh-cut” product is for the tissue to be in a living, respiring physiological state (USFDA, 2000).

Fresh-cut fruits and vegetables exemplify the consumer-driven products that have evolved from produce commodities to cater to American consumers’ increasing demand for healthy and easy-to-prepare foods. For vegetable and fruit producers/shippers, fresh-cut products have become a way of adding value to their commodities.

History of Fresh-Cut Produce

Fresh-cut produce is not a novelty. Fresh-cut products have been available to consumers since the 1930s in retail supermarkets (IFPA). Yet it hasn’t been until the past two decades that these products have gained popularity and penetration in the produce business. The demand for healthy and convenient products and advances in packaging technology have driven the expansion of the fresh-cut industry. Initially, most of the expansion occurred in the food service sector. In the 1980s, quick service restaurants like McDonald’s and Burger King were booming, and so was the demand for fresh-cut products used in their salad bars and ready-to-eat salads.

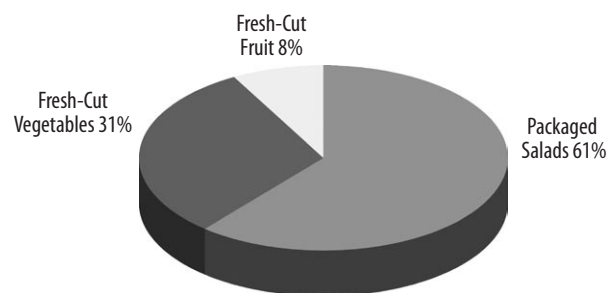
This increased demand lured individual farmers to invest in processing facilities. The increase in demand led the fresh-cut industry to increase their investment in research and development to address issues regarding raw product supply, packaging technology, processing equipment, and refrigeration. After its popularity in the fast-food sector, fresh-cut produce became available at the retail level.

Fresh International developed a bag fabricated with a special film that regulated the respiration of salad greens and slowed down the rate of deterioration. Grimmway Farms from Bakersfield California was responsible for introducing a number of packaging innovations that expanded the distribution of baby carrots to supermarkets and school lunch programs across the country. These two pioneering products were the first fresh-cut products to succeed at the retail level. They led the way for an industry that is still expanding and has recently extended to include fruits at quick-service restaurants and retail stores.

Market Size

Total sales of fresh-cut products reached nearly \$4 billion in the 52-week period that ended in August 31, 2003. Packaged salad sales accounted for \$2.4 billion, fresh-cut vegetable sales represented nearly \$1.2 billion, and fresh-cut fruit sales amounted to about \$300 million. See Figure 1 for the market share of the different fresh-cut product categories. On average, sales of fresh-cut products increased by 8% compared to 2002. Of the three fresh-cut categories, fresh-cut fruits had the largest increase at 15%, followed by packaged salad sales at 9%, and fresh-cut vegetables at 6% (Clement, 2003).

Figure 1.
2003 Market Share by Fresh-Cut Product Category



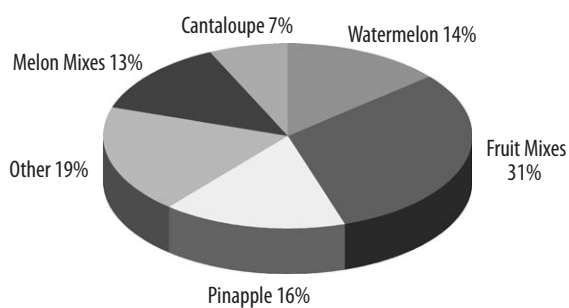
Growth in the consumption of fresh-cut products is expected to continue. The drivers for the increase in consumption of fresh-cut products in the U.S. are the rise in income levels, the increase in health consciousness, and the demand for convenience. With extra discretionary income, consumers will spend more on quality and convenience food products. In general, produce consumption is also expected to increase due to growing

awareness of the correlation between diet and health, and of the nutritional benefits of fruits and vegetables.

The food service industry is responding to consumer health concerns such as obesity by offering healthier meal options like salads and fruit. As a means to drive down costs (mostly labor costs) and waste related to meal preparation, the food service industry will be more receptive to pre-cut and processed products (Shwedel & Costa, 2004). The continued rise in two-income families will reduce the amount of time that is devoted to food preparation at home, and ready-to-eat and ready-to-cook products will be favored.

The emerging fresh-cut fruit sector will likely overshadow salad sales in the future because fresh-cut fruits are more attractive to young consumers and aging baby boomers and in general are more likely to be consumed as snack products. From the retail side, fresh-cut fruit on average has higher margins than bagged salads, which will result in ample space for display in the stores. The most favored fresh-cut fruit products with estimated market shares are shown in Figure 2. The most favored fresh-cut fruit product is a container of fruit mixes, with a 31% market share.

Figure 2.
Estimated Market Shares for Fresh-Cut Fruit Products in 2003



Source: Fresh Cut 2003

The leading company in fresh-cut fruit sales is Ready Pac, with a market share of 23%, followed by private label-store brands (31%), Del Monte (13%), Country Fresh (7%), Club Fresh (3%), and Fresh Express (1%) (Information Resources, Inc., 2003). The volume of fresh-cut fruits is projected to grow by 20 to 30% annually

for the next four years and expected to reach \$1 billion to \$2 billion in retail sales by 2008 (Miller, 2003). The fast-food sector is already doing its share in increasing the demand for packaged fresh-cut fruits by offering healthier choices on their menus.

Fresh-Cut Processors

National fresh-cut processors, particularly salad processors, are able to distribute their products nationwide and tend to produce their own raw products. Due to their production volume, big processors can easily access big markets such as supermarket chain stores. Most of the big processors, such as Dole, Del Monte, Fresh Express, and Ready-Pac, tend to market their products under their own name brand.

On the other hand, local and regional processors tend to process and market the more perishable products such as melons, tomatoes, and salads using private-store labels. A comparative advantage of local and regional processors is their proximity to the market and the demand for just-in-time deliveries. Smaller processors also have the flexibility to supply products with specific cuts, packages, or characteristics such as organic that might be demanded in smaller quantities.

Of great importance in the processing of fresh-cut produce is the need for a year-long supply of raw materials to be able to market fresh-cut products consistently. Processors have adopted several strategies to have a year-round supply of raw products. One strategy is for fresh-cut processors to locate their plants close to the source of raw products. For example, firms that produce bagged salads are able to secure a source of lettuce for a whole year by transporting their machinery (shredding and bagging machines) from California to Arizona and back, depending on the harvesting period.

Other fresh-cut processors, such as Del Monte, Dole, and Chiquita, own shares of foreign companies, giving them access to produce when it is not available domestically. Processors who are smaller in size buy their raw product from wholesale terminal markets or rely on distributor companies that already have a year-long supply of fruits and vegetables from domestic and international producers/shippers.

Indiana Melon Industry

In 2003, the total acreage devoted to muskmelons and watermelons represented the highest acreage under fruit production in Indiana. Muskmelons were planted on approximately 3,000 acres, and watermelons were planted on 7,200 acres. The production of both crops had an estimated farm gate value of \$34 million (Indiana Agricultural Statistics, 2003-2004). According to the 2002 agricultural census, about 250 farms were involved in the raising of melons, with the majority of the farms located in Knox, Gibson, Sullivan, Daviess, and Jackson counties.

Melons are usually available from the beginning of July until the first frost in the fall, which usually occurs in early October. Indiana is an important player in the Midwest market for muskmelons and seeded/seedless watermelons. It is ranked 5th in the United States in the production of both crops and 2nd in the production of eastern-type muskmelons (Indiana Agricultural Statistics, 2003-2004). Melons are marketed mostly through brokers who supply big retail chain stores and wholesale terminal markets as well as through farmer's markets, road-side stands, and other small retail outlets.

An advantage for Indiana melon growers is their strategic proximity to large urban areas in Missouri, Illinois, Michigan, Georgia, Ohio, and Kentucky. But there is intense competition from neighboring producing states, Kentucky, Missouri, and Michigan. Historically, the best prices for melons were obtained early in the season, when the harvest in the southern states (Georgia and Kentucky) was tapering down and harvesting in the northern states (Michigan) had not started yet (Gentry, 2003). However, due to extended harvesting periods in the southern and northern states, the window of opportunity for higher Indiana melon prices has closed.

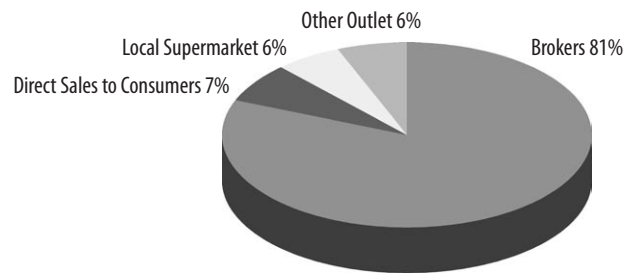
Melon Grower Survey

Indiana melon growers are seeking opportunities that could potentially aid in the economic sustainability of melon production in Indiana. By offering a consumer-driven product, growers may experience an increase in the demand for melons and higher profits by participating

farther along the supply chain that leads to the consumer. Growers may also benefit from contracting with processing companies interested in value-added melon products.

Twenty-seven melon growers completed a survey administered at the Southwest Indiana Melon Grower's Association Meeting at Vincennes, Indiana, in March 2004. These 27 melon growers are responsible for planting approximately 33% of the total acreage of muskmelon and watermelon in the state. Survey results indicate that most melon growers (81%) used brokers to market their product (Figure 3). The percentage of growers interested in increasing direct-to-consumer marketing was 63%. Forty-eight percent were interested in increasing sales at the local level. Forty-one percent were interested in increasing the number of value-added products, the

Figure 3.
Market Outlets Used by Melon Growers



volume of specialty melons marketed, and the amount of direct-to-retail marketing.

Participants were asked to identify and rank value-added melon products they thought consumers would want. The overall results of the participants' rankings indicated that fresh-cut melons would be the most likely melon product to succeed in the marketplace. Growers were asked to rank their own value-added ideas together with the list of processed melon products that were included in the survey. Products suggested by the growers included toasted melon seeds, pickled watermelon rinds, and canned watermelons. The list of products included in the survey included fruit juices, fruit roll-ups, fresh-cut fruit, and jams/jellies.

Indiana Processors

In the Midwest, most of the fresh-cut processors are devoted to vegetable and fruit processing. The most typical fruits in fresh-cut products include melons, apples, and berries. However, fresh-cut vegetables include almost every vegetable typically found in the produce section of a supermarket.

There are two melon processors in Indiana and four in northeastern Illinois. The processing facilities in Indiana belong to long-established produce distributors located in Indianapolis. Both companies process vegetables in addition to muskmelon, honeydew, and watermelon for foodservice and retail establishments under the “Freshline” and “Garden Cut” brand. Illinois processors who supply fresh cut melon products to Indiana include Ready Pac, Fresh Express, Chiquita, and Del Monte. These processors distribute fresh-cut products under their own brand names.

In addition to these six established processing facilities, supermarkets often do in-store cutting of fruits and vegetables. It is very common to find fresh-cut fruit and vegetable trays with a store label in the major supermarkets in Indiana. This practice is likely to decline as food safety regulations become more stringent, especially if Hazard Analysis Critical Control Point (HACCP) programs are required of retailers in the future.

The six melon processors in and surrounding Indiana follow a similar practice when choosing their raw products. They use western-type muskmelons and honeydews that are generally sourced from the western U.S. from May to December and from Central America during the rest of the year. Usually bigger melons (9 count per box) are favored due to their lower price and higher yield of useable product per melon (Beaulie & Gorny, 2002).

Seedless watermelons are generally sourced locally during the summer months. The smaller processors in Indiana typically use Indiana-grown watermelons in their fresh-cut products. When Indiana stops producing watermelons, producers must source the product from Florida, Texas, the West Coast, and Mexico in an effort to have a consistent year-round supply.

Fresh-Cut Processing and Quality Control

When purchasing produce-related products, consumers rate quality of taste and appearance to be the most important factors in the purchasing decision. The rapid deterioration of fresh-cut products has made maintaining quality a challenge. Deterioration occurs for several reasons:

- Fruits and vegetables do not have the natural barrier that protects them from dehydration;
- Abrasive (peeling and dicing) steps in the processing of produce promote natural, biochemical tissue degradation;
- The end products are constantly maturing until consumed;
- Microorganisms (bacteria, yeasts, molds) enhance decomposition.

Deterioration cannot be stopped, but several practices have been adopted to slow its rate. The most important practice is temperature management from processing until final consumption. Fresh-cut fruits and vegetables are usually processed within facilities whose temperatures oscillate between 1 to 4 degrees Celsius. The same temperatures are recommended throughout the supply chain. In general, low temperatures decrease the respiration rates of produce, decrease the growth of microbes, and reduce water loss.

Washing, sanitizing, and drying of fresh-cut products are practices recommended for the control of microbes on cut surfaces. The use of chlorinated water (i.e., water that has been sanitized and that maintains a low microbiological count) reduces the microbial load in cut fruits and vegetables. Freshly cut fruits and vegetables need to be dried to avoid problems with microbial spoilage of the fruit surface. Throughout the processing of fresh-cut produce, cleanliness of all work surfaces and processing equipment is recommended to prevent contamination with microbes.

Due to differences in the physiology of fruits and vegetables, product-specific practices have been adopted to retain good quality. With melons, quality control starts in the field. Muskmelon varieties with smaller seed cavities are preferred because of higher recovery of

useable product from each cut melon. The conventional ripeness level for harvesting muskmelons is typically 10 to 13 degrees Brix, sweetness levels that are desired by consumers (Clement, 2000).

To become processors, growers must continue to maintain quality control in the processing plant. At the processing plant, melons are washed, brushed, and sanitized before the peeling, deseeding, and trimming phases. Unlike other fruits, melons are generally diced by hand. Knives are kept well sharpened to prevent bruising and damage to the final melon product.

Melon chunks are typically rinsed with cold, chlorinated water at a PH of 7 after being cut. This may enhance shelf-life by reducing the microbial load and removing cellular juices on the cut surface that may promote surface discoloration. An application of calcium chloride is also recommended on the diced product to enhance its firmness. Chlorinated water and calcium chloride, used to enhance the quality of fresh cut melons, are Generally Regarded As Safe (GRAS) processing aids.

Consumers are increasingly more aware of and more concerned about food safety. The concern about the safety of fresh-cut products is because the products are eaten raw after being in contact with the soil and because there is no processing step that ensures microbiological safety (Zagory, 1999).

The majority of fresh-cut processors have adopted HACCP programs to prevent any type of hazard (chemical, physical, and microbiological). You can find the complete description of a HACCP program tailored to the fresh-cut industry in “Food Safety Guidelines for the Fresh-Cut Produce Industry,” available from the IFPA. In addition to federal, state, and local inspections, the HACCP program should be supported by other programs such as Good Manufacturing Practices (GMPs), good sanitation programs, product recall capability, and quality assurance programs. HACCP procedures require processors to be audited by a third party that assesses the safety practices utilized in the facility.

Opportunities for Indiana-Grown Melons in the Fresh-Cut Industry

The fresh-cut industry may offer some opportunities for melon growers in Indiana. Indiana could become an

important player as the source of melons for local and regional fresh-cut fruit processors. Indiana watermelons are already used by smaller processors, but not exclusively. Growers could consider participating in research trials to screen for watermelon varieties that offer a longer shelf-life and that possess the attributes (flavor, color, and texture) desired by consumers of fresh-cut fruit. A watermelon variety that proves successful for use in fresh-cut products could result in a regional increase in demand for Indiana product from small and big melon processors.

The eastern-type muskmelons typically grown in Indiana are seldom used in processing. Possible reasons for this include the following.

- 1) This type of melon is not available in the United States year round;
- 2) The fruit tends to be softer than the western-types, which results in a shorter shelf-life; and
- 3) The grooves in the rind of the fruit make peeling more difficult.

Nevertheless, there are specific varieties of eastern-type muskmelons that have potential to be used in processing. These types of melons can now be obtained from Central America during the winter months. Regarding taste, there are consumers who favor eastern-type muskmelons over western-types due to their sweetness, flavor, and aroma. Thus, there is a niche market for fresh-cut eastern-type melons that could be exploited. The feasibility of extending the shelf-life of this soft-fleshed type melon warrants further attention by growers interested in expanding into value-added opportunities.

Another possibility for melon growers in Indiana is to shift production to western-type melons. Several varieties have the potential to grow well in the sandy soils of Southwest Indiana. Melon growers could also allot some land to produce honeydew melons, a type of melon that is included in most melon mix packages. Like western-type melons, honeydews are not typically produced in Indiana, yet there are certain varieties that perform well in the Indiana environment (Foster, 2002).

Melon growers could also consider capturing a higher margin by processing their melons and adding value to their product. This type of vertical coordination scheme could allow farmers to receive consumer market signals

quickly and transmit them to their growing operations. By following a consumer-driven focus, as markets change, so would production practices. Melon growers may be able to offer niche specific products that are not yet supplied by other processors, such as fresh-cut organic melon products, fresh-cut specialty melons, melon slices, and melon halves and quarters.

Potential venues to market the Indiana grown fresh-cut products include: independent grocers, the food service industry (local fast food/buffet type restaurants), and school lunch programs. For such an enterprise to be successful, growers must identify the preferences of fresh-cut fruit consumers and the most viable marketing channels through market research. Growers should also conduct a feasibility study to determine the profitability of processing these melon products.

A major constraint for this type of enterprise would be the inability to supply fresh-cut fruit year-round. Viable strategic alliances with other domestic and/or international growers should be assessed. Thus, much more must be studied before we know whether value-added opportunities really exist for Indiana melon growers.

Conclusion

Melon production is important to Indiana agriculture. In 2003, the total acreage devoted to muskmelons and watermelons represented the highest acreage under fruit production in Indiana.

However, growers are seeking value-added opportunities that could potentially aid in the economic sustainability of melon production in Indiana. The fresh-cut industry may offer some opportunities for melon growers in Indiana. By offering a consumer-driven product, growers may experience an increase in the demand for melons and higher profits by participating farther along the supply chain. Indiana could become an important player as a source of melons for local and regional fresh-cut fruit processors.

However, offering such a product will not be easy for Indiana growers. Not only will it require a change in the types of varieties grown in Indiana, but also an expanded production season. The risks in attempting to move further along the supply chain may be too high for growers to overcome. Growers must determine if they

can compete against existing processors that have established year-round supplies of inputs and established outlets for their products.

Before entering into this market, producers should ask themselves the following questions.

- Can they maintain high quality standards throughout the process?
- Will the benefits outweigh the costs of entering the fresh-cut retail sector? That is, will this be profitable?
- Are they better off attempting to grow honeydew melons again and increasing the quality of their products?
- How will they continue to compete with other states and international growers that are increasingly encroaching into their production window?

Producers should learn more about consumer preferences and needs, and the costs associated with filling those needs before venturing further into this value-added sector.

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