MARKETING AND TRANSPORTATION FACTORS AND THE QUALITY OF FRESH AND PROCESSED CITRUS PRODUCTS

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INTRODUCTION

Quality is multidimensional. There are literally hundreds of biological, physical, economic, and policy factors that affect the quality of citrus fruit in fresh and processed product markets. The purpose of this paper is to present an overview of the relatively more important marketing, policy, and economic dimensions of citrus fruit quality.

While citrus growers are directly concerned and involved in production practices that affect the quality of their fruit on a daily basis, they are less familiar with policy and economic factors that affect the quality of fruit products. The irony of this situation is that economic returns are often more strongly affected by economic and policy factors than the cultural and biological factors. However, even if growers are familiar with the various economic and policy factors, they usually cannot control the situation themselves. In many cases, group decisions are the basis for redirecting economic and policy factors. Also, some of these economic and policy variables are controlled by state, national, and/or international events and policies, certainly outside the direct control of individual citrus growers. In any event, it behooves growers and related agribusiness leaders to become familiar with the marketing, transportation, economic, and policy aspects of citrus product quality and attempt to capitalize upon that information for increased profits.

PHYSICAL MARKETING FUNCTIONS

Transportation, storage, and processing are the three physical functions of marketing agricultural commodities beyond the farm gate. Each of these functions can seriously affect the quality of fresh and processed citrus products.

Transportation and Storage

Product quality is affected by transportation at several stages in the marketing of fresh and processed citrus products. Transportation is required for fruit from groves to packing houses and processing plants, as well as transportation of intermediate (bulk) products for additional processing at locations closer to consumption, transportation of final products from Florida packing and processing plants to wholesale/retail warehouse or distribution centers, transportation from warehouse distribution centers to retail outlets, and transportation to various institutional users (fast foods outlets, restaurants, hotels, hospitals, military institutions, prisons, airlines, etc.).

Product quality is also affected by the type of service within each stage of product transportation. For example, the nature and quality of refrigeration, containers, packaging, grading, distance travelled, and storage life affects the value of citrus fruit and/or citrus products sold. Obviously, the more perishable the product being transported, the more vulnerable is the product to quality deterioration from faulty transportation methods. Fresh, chilled, and frozen products have very specific refrigeration requirements to minimize quality loss in transport beyond the packinghouse or processing plant gate.

Over the coming years, the transportation situation is likely to change. It will be vital for shippers and receivers to remain abreast of developments to insure that they receive the highest service at the best price. For example, the use of stack trains has increased dramatically. These are double-stacked containers on railroad flatcars. Particularly for longer runs, the savings can be dramatic. Currently, virtually no domestic perishable food product moves by stack trains, but this development is expected for perishables in the future. Two disturbing trends among motor carriers are an aging of the fleets and demographic trends pointing to shortages of qualified drivers. The aging of fleets generally is not yet very pronounced and may just be part of a cyclical movement, rather than a long term trend. Driver shortages, however, will be more serious, particularly for cargos, such as perishables, that require driver attention to insure quality.

Storage occurs at several stages of marketing fresh and processed citrus. These stages include the following: on tree, on farm, pre-packing or pre-processing, packed cartons or packed processed products at Florida plants, packed cartons or packed processed products at wholesale or retail storage centers, storage at various institutional outlets, and home storage.

The quality of storage services also affects the quality of final consumer products. Thus, satisfactory storage requires the necessary storage equipment and facilities, including the proper refrigeration or freezing while in storage, adequate containers for bulk or consumer sized packages, and the necessary space for storage at reasonable cost.

Aseptic, irradiation, and new controlled atmosphere techniques hold out the promise of longer storage life at less cost and the ability to compete in more distant markets. However, quality considerations,--both real and perceived-- may dominate. Does the aseptic process change the flavor? Is irradiation dangerous or widely believed to be? There is another problem regarding improved preservation techniques, one that we do not like to discuss--competition. Florida is the closest major citrus producer to the large Northeastern and Northcentral markets. In general, advances in transportation and storage favor producers furthest from these markets. However, as transportation and storage advances are made, Florida producers will be better able to compete in distant markets, such as Europe and Japan, but at the cost of more exposure to foreign competition. The knife cuts both ways.

Processing

The Florida citrus industry is internationally recognized for its processed citrus products. Approximately 90% of Florida's orange crop is processed into various products, while slightly over 50% of the grapefruit crop is processed. Lesser percentages of specialty citrus fruits are processed.

State and/or federal regulations impose minimum quality standards for processed citrus products. Individual processors may establish quality standards above these standards if they wish to differentiate their products from generic products. The fruit quality at delivery to the processing plant is important in determining not only final consumer product quality, but also economic returns to growers. That is, delivery of fruit with certain levels of Brix are rewarded in relation to fruit delivered with substandard Brix or Brix-acid ratios.

The processing function involves a wide variety of technologies and products. Fruit eliminated at the fresh citrus packing house is processed into canned juice products or other products with relatively low value added. The bulk of the oranges in Florida are processed into frozen concentrated orange juice or chilled orange juice with relatively high value added.

The growth in the chilled juice market, along with increased imports of frozen concentrated orange juice following several years of hard freezes in the Florida citrus belt, has led to increased processing and storage in bulk form for later reprocessing into chilled juice. Reconstitution of concentrated orange and grapefruit juices in non-Florida locations has created the presumption that enforcement of quality standards of these products are compromised.

The production of citrus juices in retail form by entities outside of Florida weakens the linkage between the consumer and Florida. Orange juice now comes from New Jersey dairies as well as Florida groves. New Jersey dairies may use pure Florida concentrate or Brazilian concentrate passing through Florida or Brazilian concentrate entering through Northeast ports or all three sources. A hard question must be asked, "to the extent that Florida becomes a supplier of inputs for New Jersey dairy orange juice, rather than Florida orange juice, how should Florida's advertising programs and quality standards be adjusted to square with the new market realities?" This question may be a bit premature, but the market appears to be moving in the direction of less control of final consumer products by Florida growers and processors.

In addition to pure juice products, a wide variety of citrus containing food and non-food products are processed in Florida and elsewhere. These products range from carbonated drinks with minor percentages of juice to citrus oils used in fragrances. Of course, citrus pulp is an excellent livestock feed processed as a by-product of citrus processing.

IMPACT OF PUBLIC POLICIES

Public policies establish rules for determining and enforcing quality standards. These rules may be established by state and/or federal laws and be mandatory upon all participants in the market. In some cases the laws are written as enabling legislation, permitting growers or handlers the opportunity to initiate the quality controls for the industry or group affected.

Marketing Orders

Florida Citrus Code.-- The Florida Citrus Code is a form of state marketing order for the Florida citrus industry. The Code is derived from State of Florida law. This law or Code imposes mandatory regulations upon growers, handlers, and processors of citrus products. The purpose of the Florida Citrus Code is to exercise the police power of the state to protect the health and welfare of the Florida citrus industry, as well as to protect and stabilize the industry. It covers fresh fruit, canned juices, and concentrated citrus products.

The Code imposes regulations for grading, inspecting, standardizing, and classifying citrus fruit and the canned and concentrated products. The objective of these regulations is to furnish prima facie evidence of the quality and condition of Florida products. Benefits accrue to carriers and receivers of these products in terms of assurance of quality products for the benefit of consumers.

Some examples of quality control sections of the Code include the following:

Maturity standards for fresh and processed grapefruit
Minimum ratios of solids to acid for grapefruit
Maturity standards for oranges
Minimum ratios of solids to acid for oranges
Maturity standards for tangerines
Minimum ratios of solids to acid for tangerines
Minimum standard for color break
Authority of citrus inspectors
Immature and unfit fruit
Grading of fresh citrus fruit
Falsification of weights
Definition of canned or concentrated fruit products
Grading processed citrus fruits
Unlawful to process unwholesome citrus
Dyes and coloring matter to be certified prior to use
Coloring grapefruit and tangerines prohibited
Rules for oranges to be colored
Standard shipping box for fresh citrus fruit
Frozen citrus fruit
Freeze-damaged fruit in concentrated products
Rules and regulations for frozen citrus juices
Standards for canned orange juice

Standards for canned grapefruit juice
Standards for high density concentrated juice
Labeling requirements for citrus oils

The standards established by Florida law are intended to prescribe "excellence" or at least minimum quality conditions. The presence of so many quality standards suggests that Florida citrus growers and processors have been keen to initiate and maintain high standards of product quality.

While the Florida legislature enacts laws to cover the broad quality standards, the Florida Citrus Commission has the authority to establish the related rules and policies for carrying out the intent of the Florida Citrus Code. Once these laws and rules are duly established, they become mandatory upon all affected participants.

Making these quality controls mandatory is important for maintaining discipline of the quality standards deemed in the best long run interests of both producers and consumers. Otherwise, "free riders" can obtain benefits without meeting minimum standards. Lack of enforcement can destroy discipline and doom the benefits of minimum quality standards for producers and consumers.

Minimum maturity standards for fruit quality are designed to reflect the earliest stage of acceptability to the consumer. Florida's maturity standards for fruit to be processed are designed to do much more. These processed fruit standards aid the processor in purchasing fruit requirements, as well as providing the citrus grower with goals for production and harvesting.

Under Florida regulations, fruit may be mature for fresh purposes, but not mature for processing purposes. Likewise, fruit passing maturity for processing purposes may not always pass maturity for fresh use. Florida's maturity standards also vary depending upon fruit source. For example, if grapefruit that is eliminated from a fresh packinghouse goes to the cannery at a certain time of the year, the minimum Brix-acid ratio is 7.5:1. If it is eliminated from a sectionizing plant, it must have a minimum ratio of 6.5:1. At the same time, fruit from the grove traveling directly to the cannery must have a minimum ratio of 8:1. Thus, Florida's maturity standards reflect the delicate balance between product quality and economic advantage to the industry.

Considerable authority is granted by the legislature to the Florida Department of Citrus to establish citrus product standards by rule making. However, Florida Department of Citrus rules cannot be contrary to federal law or to the standards specified in Florida statutes. For example, Florida state grades for processed products are now the same as USDA grades with only a few exceptions. One exception occurs with canned and chilled grapefruit juice where Florida's grade standard is higher. Using USDA scoring, Grade B chilled grapefruit juice must score at least 80 points, while the Florida State Grade B for the same product is a minimum of 88 points. Another exception is that all Florida packed FCOJ must have USDA

Grade A flavor, regardless of whether the finished product is to be packed as Grade A or Grade B.

Even where there are no established grades for certain products, the Department of Citrus establishes quality requirements. For example, calcium fortified orange juice and other similar non-standardized products are required by the rules to have reasonably good color and good flavor. Also, such products as pulp wash and grapefruit juice beverage base have a regulatory scheme designed to control the production and ultimate use of these products or by-products.

Federal Marketing Orders.-- In 1939 Florida fresh citrus growers and handlers began their involvement with federal marketing orders. These orders have been designed to maintain minimum quality standards for fresh shipments of citrus in interstate and export commerce. The Citrus Administrative Committee is the industry policy committee comprised of nine growers, eight shippers, and one public member. The Committee establishes an annual marketing policy and recommends minimum quality regulations to the U.S. Secretary of Agriculture.

Under federal marketing orders, a variety of supply management, minimum quality, and market support activities can be recommended. In actual practice in Florida citrus, volume management is rarely practiced, in sharp contrast to the long history of prorates in California-Arizona citrus. The Florida citrus industry, however, has occasionally imposed "shipping holidays", though not in recent years. Market support activities have not been utilized via federal marketing orders because of the emphasis of advertising and promotion with the Department of Citrus' program.

Grade and size regulations are the core of the federal marketing order program. The federal program also grants authority to establish standards for pack and containers. A recent issue has been the regulations regarding the present definition of Canada and Mexico as domestic markets. There is considerable support now to define these foreign markets as "export" markets so that differential size regulations would apply. The increased interest in making a change in policy relates to the preferences of Canadians for smaller sized grapefruit than is the case in the U.S. market.

U.S. Department of Agriculture Grades

The U.S. Department of Agriculture, through its Agricultural Marketing Service, establishes U.S. grades for fresh and processed citrus products. These USDA grade standards are inspection aids, adopted through industry cooperation to assist in the orderly marketing of products. The USDA grading system is voluntary and self-supporting. Often USDA grading is used between buyers and sellers as an impartial determination of product value. Also, USDA grading can be required for bank loans on inventory. In the case of USDA grade standards for orange juice and grapefruit juice packed in Florida, these standards are incorporated into mandatory Florida standards.

There are three U.S. grades of orange and grapefruit juices--grades A, B, and Substandard. To be "Grade A" a product must meet a minimum score of 90 points, while at least 80 points are required for "Grade B". Products scoring less than 80 points are deemed "Substandard". Scoring is based upon three quality factors: color, flavor, and absence of defects.

In addition to quality factors, certain analytical factors are tested, such as Brix, Brix-acid ratio, and recoverable oil. Compliance with grade standards does not necessarily mean that the product complies with all applicable federal or state laws, nor does it excuse failure to comply with these laws.

U.S. Food and Drug Administration

Federal standards of identity are defined for grapefruit and twelve forms of orange juice. The adoption and enforcement of these standards are by the U.S. Food and Drug Administration (FDA).

Standards of identity are designed to assure consumers that certain products meet their expectations of quality, allow for an honest basis of product comparison, and lessen the likelihood of deceptive labeling. In the standard of identity for citrus juices, factors including minimum Brix, minimum Brix-acid ratio, and particular processing methods make up the key components of the standards.

Under the Fair Packaging and Labeling Act, FDA has regulated the common or usual names of certain foods that have no standards of identity. For example, these regulations apply to diluted orange juice beverages by requiring labeling of orange juice content in these diluted products.

Transportation Regulations

At the federal level, Glasnost came to transportation in the late 1970s. The economic regulation of interstate transportation was dramatically loosened. Since 1978, railroads have been exempt from regulation for produce transportation. Largely in response to this, in November 1982, CSX instituted the "Orange Blossom Special", which is today a major carrier of fresh citrus. In 1980, motor carrier legislation was enacted which greatly liberalized entry and rate-making requirements for hauling of processed products, such as juice.

What do these developments in transportation policy mean for the quality of fresh and processed citrus products? It means that there are a lot more choices than before, and on a buyer beware basis. Phil's Fly-by-Nite Trucking can haul your juice as well as Indian River Transport. And Phil might do a great job for you and at a lower cost or he might ruin the load. You can find bargains out there. You can get service tailor-made to your quality requirements, but be careful.

ECONOMIC FACTORS

Supply-Demand Imbalances

The degree of imbalance between demand for citrus products and supplies can influence the quality of products marketed. In periods of excessive Florida supplies, the average quality of products marketed tend to rise, while the average quality tends to fall during periods of shortages and supply shortfalls. Freezes, hurricanes, drought, and other natural events have been known to cause dramatic and unpredictable changes in marketable output. It is also normal to expect increased tree plantings following major Florida freezes. These events can and have also led to changes in minimum quality standards.

Brands Versus Minimum Grades

There is a moderate trend toward increased sales of branded products for both fresh and processed citrus. Successful packer brands are products with quality standards that are consistently above some threshold or minimum level. These successful citrus brands command sufficient loyalty among consumers to elevate branded prices somewhat above generic or private label brands. Large scale advertising expenditures are usually required to develop packer label brands. Once these brands are developed, consumers associate a certain quality standard with these branded products. Given brand loyalty and consistent quality standards imposed by the marketing firm, it can be argued that branded products do not have as serious a need for public grades and standards.

Economic Impact of Minimum Quality Standards

For generic products, minimum quality standards can have three possible effects, as follows:

(a) Increase in retail demand.
This beneficial impact can and does occur when quality standards are changed to more closely correspond to consumer preferences.

(b) Reduced marketing margins.
An increase in minimum quality standards can have the effect of reducing spoilage, increasing turnover, and reducing marketing costs. Reduced marketing costs enhance benefits to both producers and consumers.

(c) Increased total returns to growers.
If citrus products have inelastic demands at farm level, increased quality standards can reduce effective market supplies and thus, increase total returns to growers. While most minimum quality standards have as their primary objective the fulfilling of consumer needs and wants, these standards often contribute to improved

economic returns to growers by decreasing marketable supplies somewhat.

Some Objectives of Minimum Quality Standards

Minimum quality standards can address a number of marketing problems. Included are problems such as excessive shrinkage, poor product image, failure to match product characteristics to consumer demand, free riders, long distance transactions problems, and low quality imports. All of these marketing problems can be attacked with industry programs and to a lesser extent by individual firms.

Critics of minimum quality standards argue that consumers have very diverse wants and preferences and that they can express their choices at the retail store. However, in the real world of agricultural markets characterized by seasonal production, perishable products, and less than perfect information, there may be benefits from restricting choice with minimum quality standards. It is inefficient to ship all sizes, grades, and maturities of a product to market if half of the product is left on the store shelves by consumers and ends up as waste. The problem of waste is evident with fresh citrus markets, but not as serious with chilled and frozen citrus products.

Concluding Remarks

The Florida citrus industry has diligently pursued a goal of high quality products for consumers as evidenced by the myriad of state and/or federal quality regulations for fresh and processed products. As competition for domestic and international markets continued unabated, quality standards will require continuous reevaluation and change to meet the competition.

The important point about minimum quality standards is that they should reflect consumer preferences. Moreover, the market system should work in such a manner that these preferences be communicated up and down the marketing system (consumer, retailer, wholesaler, broker, processor, transporter, warehouse, packing house, and grower).

Selected References

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