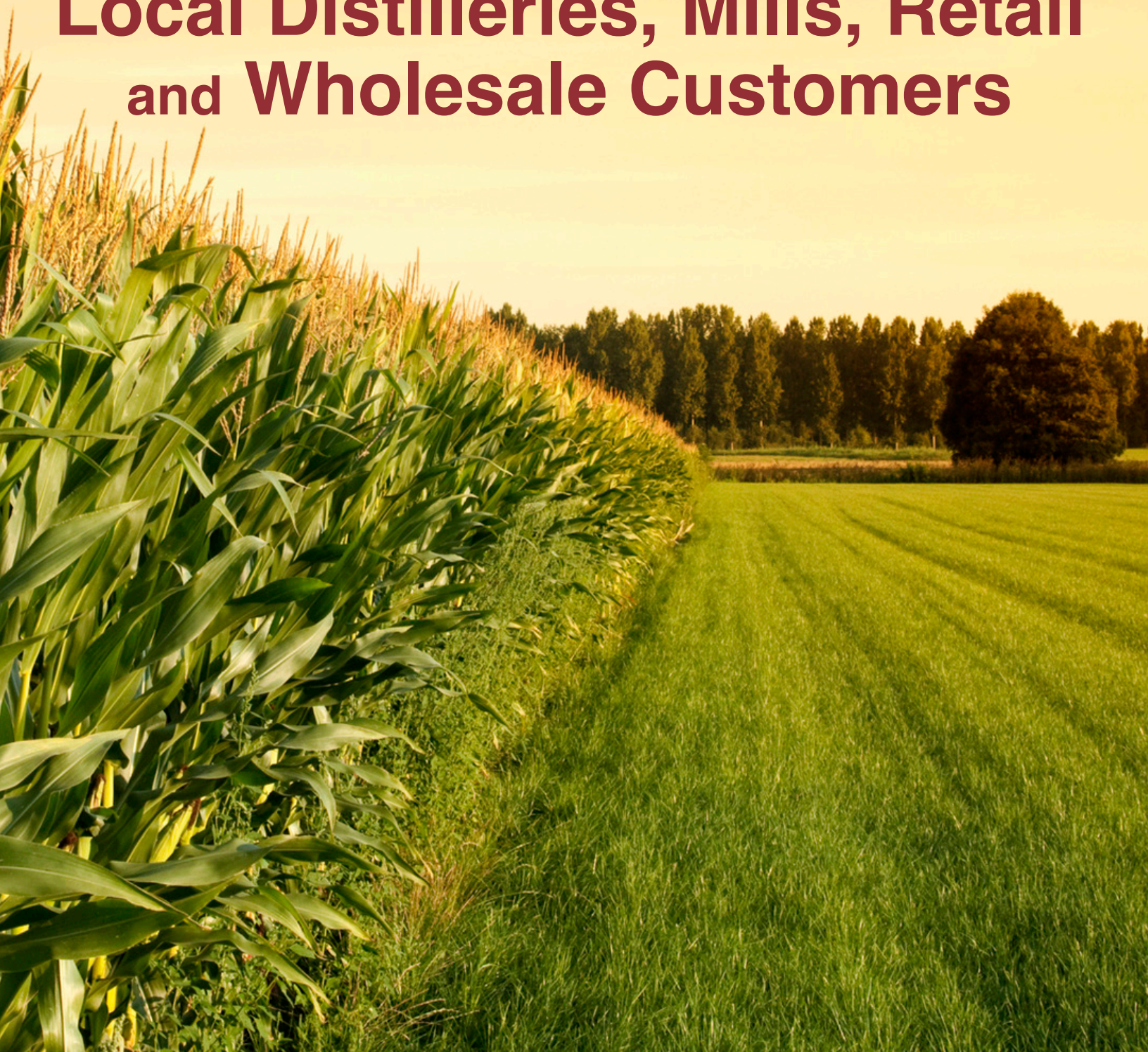
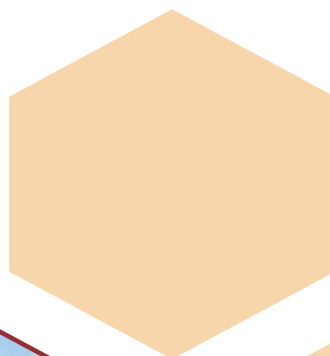


An Overview of Marketing Corn to Local Distilleries, Mills, Retail and Wholesale Customers



Contents

Introduction.....	1
Growing and Harvesting	1
Cleaning	1
Storing	2
Processing.....	3
Scenarios.....	4
Corn is Sold Unprocessed	4
Producer Processes Corn.....	4
Third Party Processes Corn.....	4
Packaging and Labeling.....	5
Transportation.....	6
Quality Specifications for Distilling and Milling.....	7
Mycotoxin Levels.....	7
Testing for Mycotoxins.....	8
Additional Market Considerations.....	8
Conclusion	9
Acknowledgements.....	10
References and Additional Resources.....	10



An Overview of Marketing Corn to Local Distilleries, Mills, Retail and Wholesale Customers

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Introduction

Fueled by consumer demand for local and regional foods, many distilleries and mills in Tennessee are interested in sourcing corn from local farmers to produce value-added foods and beverages. Recent changes to legislation regarding the establishment of distilleries in Tennessee have provided new market opportunities to both local farmers and distillers [1]. According to the Tennessee Department of Agriculture's (TDA) Food and Dairy Section of Consumer and Industry Services, the number of distilleries operating in Tennessee increased from 6 to 17 from 2014 to 2017 [2]. Many of these recently launched distilleries look to satisfy part of their grain demands from local farmers so they can market their products as locally sourced and produced. Additionally, several small-scale mill enterprises are interested in buying locally grown corn to process into corn meal and grits. Individual producers are also seeking opportunities to direct market milled corn products to retail and wholesale outlets such as farmers markets, grocery stores, hotels, restaurants and institutions.

Producers supplying corn to local distilleries and mills or marketing their own milled corn products often lack information about equipment and infrastructure needs, buyer requirements and applicable regulations. Direct sales of corn and milled products usually involve multiple steps of the supply chain beyond producing the grain, including cleaning, storing, processing, packaging, labeling, transportation and marketing. This publication gives producers an overview of selling corn to local distilleries, mills and as a value-added food product, and discusses producers' potential equipment and infrastructure needs, regulatory requirements, grain quality specifications and marketing considerations.

Growing and Harvesting

Corn can be grown and harvested for distilled and milled corn products using a variety of farming technologies

and practices. TDA's Consumer and Industry Services, responsible for enforcing food manufacturing regulations in the state, does not require producers to follow specific regulations in the growing and harvesting of corn that will be sold to local distilleries, mills or other direct marketing channels.

Some corn harvesting equipment yields a "field clean" corn by discarding the lighter-weight kernels and other unwanted corn plant materials, such as pieces of stalk, husks and cobs [3]. However, corn grown for distilling and milling usually requires further cleaning after harvest.

Buyers may be interested in sourcing corn with specific qualities that benefit their manufacturing process or their marketing strategy. Understanding the grain quality specifications and characteristics that buyers seek should be helpful to producers in choosing seed varieties and production methods.

Cleaning

Depending on their buyer's needs and grain quality specifications, or the producer's intended use of corn in manufacturing milled food products, producers may need to clean their corn beyond "field clean." Distilleries can usually handle small amounts of corn stalk and cob residue in the distilling process. However, excessive amounts of debris can result in efficiency losses during distillation [3]. Corn needs to be mostly free of broken kernels, dirt, husks, hulls, cobs and foreign material when selling milled corn products. Small pieces of husk, cob or lightweight kernels can adversely affect the milling process and the quality of the final milled product.

Cleaning corn is not considered a component of food manufacturing by TDA's food processing regulations. Therefore, TDA does not have specific regulations or permit requirements when cleaning corn for local distilleries and mills. Cleaning expectations are typically established between the grower and the buyer.

Producers that own grain-cleaning equipment may perform on-farm cleaning. Producers without cleaning equipment can use a third-party grain cleaning facility. However, many producers may not have access to a nearby grain cleaning facility and transporting grain to the closest facility may be cost-prohibitive. Therefore, producers need to consider the investment costs of purchasing cleaning equipment versus the added transportation costs and fees associated with paying a third-party grain cleaner to provide the service. In their cost analysis, producers should consider the cleaning equipment’s purchase price, operating and maintenance costs (including labor), and life expectancy.

Storing

Distilleries and mills with on-site storage capacity may ask farmers to make less frequent, bulk deliveries of grain to their facilities. Distilleries and mills with minimal storage space may require smaller, more frequent deliveries throughout the year. Farmers providing local distilleries and mills with corn on a recurring basis or that produce their own milled food products will likely need to have long-term grain storage capacity. Producers should determine whether their current grain storage capacity satisfies their expected demand, as well as estimate the cost of additional storage bins if more storage area is needed.

Prices negotiated between buyers and sellers should reflect the cost of storage, including capital recovery of fixed assets, shrinkage, interest, risk of quality deterioration, aeration, and added handling and transportation charges. In addition, producers growing multiple types of corn or

other commodities should consider the operational costs of segregated storage and the cleaning of conveyance equipment to avoid cross-contamination of grain varieties.

Storing corn sometimes requires a grain dealer or commodity warehouse license through TDA’s Division of Agricultural Inputs. TDA defines a grain dealer as “any person engaged in the business of buying commodities from producers thereof for resale or for milling or processing.” [4] Therefore, producers who purchase corn from other farms to supplement their grain production and sell to local buyers need to apply for a grain dealer license through TDA’s Division of Agricultural Inputs.¹ A grain dealer license is not required if the producer only stores and sells corn grown and harvested by the producer.

TDA offers various types of grain dealer licenses. At the time of publication, the Incidental Grain Dealer License is available for a \$50 application fee to individuals with grain purchases of less than \$100,000 per year (See Table 1). The Class 1 Grain Dealer License is available to individuals with grain purchases exceeding \$500,000 per year. The Class 2 Grain Dealer License is available to buyers with annual grain purchases ranging from \$100,000 to \$500,000. There is a \$150 application fee associated with the Class 1 and Class 2 Grain Dealer Licenses. Producers should contact TDA to verify the most current application requirements and fees. Both applications are accessible online and can be downloaded through the Feed, Seed and Fertilizer Forms webpage (tn.gov/agriculture/article/ag-licenses-feed-seed-fertilizer).

¹ Distilleries and mills that purchase grain from unlicensed grain dealers need to acquire a grain dealer license.

<i>License Type</i>	<i>Level of Annual Grain Purchases</i>	<i>Application Fee</i>
Incidental Grain Dealer	< \$100,000 per year	\$50
Class 1 Grain Dealer	> \$500,000 per year	\$150
Class 2 Grain Dealer	Between \$100,000 and \$500,000	\$150

Processing

Processing corn involves grinding, cracking, hammering or milling the grain. Distilleries need corn ground, hammered or cracked to begin the distillation process [5]. Food products made from corn, such as corn meal or grits, must be finely ground for market.

Many distilleries request that corn is processed prior to purchase. However, distilleries that own grinding equipment may request unprocessed corn deliveries, as they often perceive that grinding corn immediately before distilling improves the quality of the final product (Figure 1). Corn sold to mills is usually sold unprocessed.

TDA food processing regulations state that grinding, hammering, cracking or milling corn for human consumption is considered food manufacturing. As a result, corn processed for distilling, milling, or other value-added food and beverage products should occur at food manufacturing facilities inspected and permitted by TDA’s Food and Dairy Section of Consumer and Industry Services. The person or entity who does the actual processing is required to obtain and maintain a food manufacturing permit. The person or entity who further packages and labels the processed grain also may be required to obtain a food manufacturing permit.



Figure 1. Corn processing equipment operated by a local distillery.

In some cases, producers marketing corn directly to distilleries, mills or in value-added food products need a food manufacturing permit. Three scenarios are described below to help producers determine whether they need to obtain a TDA food manufacturing permit. These scenarios are also summarized in the accompanying flow chart (Figure 2).

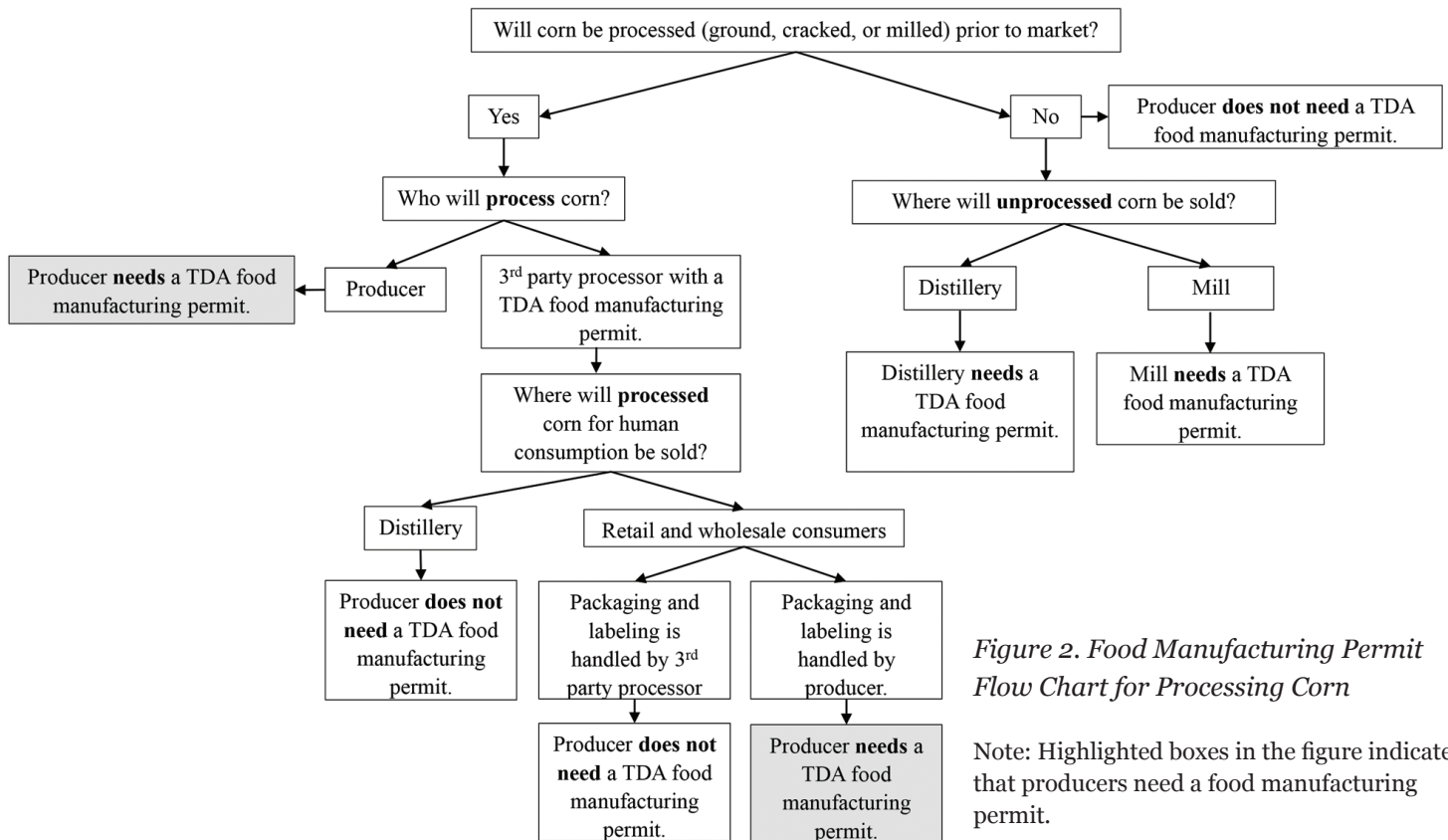


Figure 2. Food Manufacturing Permit Flow Chart for Processing Corn

Note: Highlighted boxes in the figure indicate that producers need a food manufacturing permit.

Scenarios

Corn Is Sold Unprocessed

- Producers selling whole, unprocessed corn directly to a distillery or mill do not need a food manufacturing permit from TDA. The distillery or mill processing corn, however, is required to obtain a food manufacturing permit and must follow other applicable food processing regulations.

Producer Processes Corn

- Producers grinding, cracking, hammering or milling corn on their farm to sell the processed grain to distilleries or convert into a value-added food product must obtain a TDA-issued food manufacturing permit. Farmers must follow good manufacturing practices that ensure product safety and have their operation and grinding equipment inspected by TDA officials for permitting.²

Third Party Processes Corn

- Producers do not need a food manufacturing permit from TDA when using a third-party grain processing facility to grind corn that will be sold to distilleries as long as the producer does not package the ground product. The third-party facility providing the grinding service needs a food manufacturing permit, however.
- Producers do not need a food manufacturing permit when using a third-party grain processing facility to process and package milled food products that the producer will sell directly to retail or wholesale customers, as producers are not involved with processing, handling or packaging the milled corn product prior to market. The third-party grain processor needs a food manufacturing license from TDA.
- Producers should obtain a food manufacturing permit when using a third-party grain processing facility to process corn that the farmer will thereafter package and label after leaving the grain processing facility. In this scenario, the third-party grain processor also needs a food manufacturing permit from TDA.

²More information on good manufacturing practices is available in 21 CFR 110. Available at <https://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfcfr/CFRSearch.cfm?CFRPart=110>.

More information about the licensing process and food manufacturing application can be obtained online through TDA's Consumer and Industry Services, Food Safety Section (<https://www.tn.gov/agriculture/article/ag-business-es-starting-a-food-manufacturing-business>).

Producers asked by buyers to process corn before delivery need to own specialized grinding equipment or have access to a third-party facility that offers grain processing services. However, producers without grinding equipment may not have access to a nearby grain processing facility, and transporting grain to the closest facility may be costly. Thus, producers should analyze the cost of purchasing grinding equipment to meet their buyer's needs relative to the transportation cost and fee of paying a third-party grain processing facility. In analyzing equipment costs, producers need to consider the equipment's purchase price, operating and maintenance costs (including labor), life expectancy, and food manufacturing permit fees.

Packaging and Labeling

Distilleries and mills without grain storage may ask producers to deliver corn in large tote sacks or bags. Common bagging materials include 1- to 2-ton super sacks and 50- to 100-pound bags (Figure 3). Milled corn products for retail and wholesale markets have more packaging and labeling requirements than corn sold for further processing to distilleries and mills.



Figure 3. Example of 1-ton super sack used by a local distillery.

TDA officials must verify that food products are packaged in food-grade packaging materials and contain the minimum labeling requirements.

The US Food and Drug Administration (FDA) requires that all packaged food items contain:

- 1) The name, street address, city, state and ZIP code of the manufacturer, packer or distributor.
- 2) The net weight of the food product in the package, expressed in metric (grams, kilograms) and US Customary System (ounces, pounds).
- 3) The common or usual name of the food.
- 4) The ingredients in the food, listed in order of predominance by weight.³
- 5) The nutritional content of the food product.

Refer to the US Code of Federal Regulations (CFR) Title 21, Section 101 or the University of Tennessee Extension publication PB 1399 “Getting Started in a Food Manufacturing Business in Tennessee” [6] for more information on product packaging and labeling. Figure 4 displays a correctly labeled milled corn product from a local, Tennessee farm.

All corn sold by weight to distilleries, mills or as a value-added, milled food product must be weighed using scales inspected and approved by TDA’s Consumer and Industry Services, Weights and Measures Section. Milled corn products (i.e., corn meal, grits, etc.) should not contain less than the net weight of product labeled on the bag.

The cost of permitting commercial scales ranges from \$25 to \$250 and depends on the weighing capacity of the scales and the number of scales inspected. More information regarding scale requirements and inspections can be accessed through TDA’s Consumer and Industry Services,

³The FDA does not consider corn to be a major food allergen. Allergen advisory statements are not required for milled corn products when corn is processed in a facility that does not also process one of the major food allergens – milk, eggs, fish, tree nuts, wheat, peanuts, soybeans and crustacean shellfish. However, corn processed in a facility (particularly when using the same processing room or equipment) that also handles one of the major food allergens should indicate the potential of cross-contact of corn with the specific food allergen ingredient(s). A statement such as “May contain _____” or “Produced in a facility that also uses _____” should be included.



Figure 4. The above images show the front and back panels of a Tennessee producer’s customized label for farm-grown and processed grits. The product contains all five of the mandatory labeling requirements stipulated by the FDA. (Images used with permission of Shelton Farms.)

Weights and Measures Section webpage (tn.gov/agriculture/article/ag-licenses-weights-and-measures).

Transportation

When selling grain to distilleries and mills, delivery logistics are established by the grower and the buyer. The transportation method may depend on whether the corn is shipped in bags or bulk truckloads. Bagged corn is often stacked and hauled on wooden pallets to facilitate loading and unloading. Distilleries and mills with storage bins may request bulk corn shipments transported in 1,000-bushel grain haulers.

TDA food manufacturing regulations do not apply to the transportation of grain from the farm to the distillery or mill. Producers should ensure that their corn is secure and protected from inclement weather during transportation, however.

Quality Specifications for Distilling and Milling

Producers selling corn to distilleries and mills need to meet buyers’ grain quality criteria, including expectations of corn cleanliness, moisture content and food safety standards. The producer and the buyer will confirm that the delivered grain meets all previously negotiated requirements.

Cleaning standards of distilleries are less stringent relative to those of mills (refer to the section on “Cleaning”). The

US Code of Federal Regulations (CFR) Title 21, Section 137.250 specifies that the moisture content of milled corn products cannot exceed 15 percent. Corn used in distillery production is typically delivered with a moisture content of 13 percent [3]. In addition, many distilleries and mills ask producers to certify that their corn has been tested for aflatoxins and other mycotoxins to comply with federally stipulated grain quality standards in food products for human consumption.

Mycotoxin Levels

According to the FDA, “Aflatoxins are toxic by-products of mold growth on certain agricultural commodities.” [7] Aflatoxins are a type of mycotoxin that tend to propagate on corn grown under extreme weather conditions, such as drought, high temperatures, frost and hail, or due to severe insect or weed damage [8]. Fumonisin is another type of mycotoxin that can adulterate human food and animal feed products [9]. The FDA has stipulated maximum levels for the amount of aflatoxins and fumonisins present in human food and animal feed products (Table 2). Table 2 shows the FDA-recommended maximum concentrations of mycotoxins commonly associated with corn-based food products.

In the distiller industry, the primary concern for mycotoxins is related to mycotoxin levels in the distiller’s spent grain, the byproduct that is often fed to livestock post distillation.⁴ High levels of aflatoxins and fumonisins can

be hazardous to animal health [9]. To reduce their liability, distilleries may ask farmers to provide a certificate of analysis verifying that the delivered corn’s aflatoxin and fumonisin levels are below the FDA’s acceptance levels of grain used in food for human consumption.

When selling corn as a milled product, farmers should obtain and provide a certificate of analysis confirming that their corn does not surpass the FDA’s action levels for mycotoxins found in human foods. For further information about the FDA’s guidelines and acceptance levels for mycotoxins in human food and animal feed products, refer to “FDA Mycotoxin Regulatory Guidance,” which summarizes all FDA guidance documents written by the National Grain and Feed Association [9].

Testing for Mycotoxins

Testing for mycotoxins is usually conducted at specialized laboratories. Between 50 to 200 grams of grain sample are needed for most laboratories to perform mycotoxin tests. Producers send their grain samples by mail.

Producers have several options when choosing a facility that tests for mycotoxins. At the time of publication, A&L Analytical Laboratory and Barrow-Agee Laboratories LLC

⁴ Distilleries that distribute distiller by-products for animal feed are required to obtain a Commercial Feed Facility License from the TDA and label the product.

Table 2. FDA-recommended Maximum Concentrations of Mycotoxins Present in Corn Intended for Human Consumption		
Mycotoxin	Product	FDA Action Levels for Human Consumption (parts per billion or parts per million)
Aflatoxin	All foods*	20 ppb
Fumonisin	Degermed dry milled corn products (e.g., flaking grits, corn grits, corn meal, corn flour with fat content of <2.25 percent, dry weight basis)	2 ppm
Fumonisin	Whole or partially degermed dry milled corn products (e.g. flaking grits, corn grits, corn meal, corn flour with 4 fat content of ≥ 2.25 percent dry weight basis)	4 ppm

*An exception to this rule is that aflatoxin M1 levels in milk do not reach 0.5 ppb.

Source: Food and Drug Administration (FDA). (2011). FDA Mycotoxin Regulatory Guidance: A Guide for Grain Elevators, Feed Manufacturers, Grain Processors and Exporters. Available at <https://www.ngfa.org/wp-content/uploads/NGFAComplianceGuide-FDARegulatoryGuidanceforMycotoxins8-2011.pdf>

are two Tennessee companies with operations in Memphis that conduct mycotoxin tests for corn. Alltech and Silliker, respectively, are international companies that offer testing services. Alternatively, local farmer cooperatives and grain dealers are often able to help farmers contact laboratories and send grain samples to testing facilities. The University of Kentucky's Extension publication, "Options for Mycotoxin Analysis in Corn and Feed," provides information about mycotoxin sampling, testing techniques and a list of laboratories that test for mycotoxins [10].

Additional Market Considerations

Producers interested in selling corn in the distiller and mill markets should consider contacting nearby distilleries or mills to assess their interest in purchasing grain from local growers and to discuss their buying requirements in terms of grain quality, processing, packaging and delivery. Before committing to or contracting with a local distillery or mill, it is important that producers develop a business plan with a feasibility study to determine the enterprise's potential. The business plan should also include a marketing plan and address other risk management strategies such as product liability insurance. As with any market, producers will want to explore price points before selling corn to distilleries, mills, or to retail and wholesale customers as a value-added, milled food product. Producers must examine the opportunity cost of not producing and selling corn through traditional grain markets or developing alternative agricultural enterprises.

Producers' involvement in each step of the supply chain — cleaning, storing, processing, packaging, labeling, transportation and marketing — will largely depend on their end-customer's expectations of the final product. These post-production activities entail additional costs that farmers should consider prior to growing corn for these markets. While direct sales of corn and value-added milled corn products often provide producers with an opportunity to receive higher prices relative to traditional grain markets, producers must thoroughly analyze their production and marketing costs relative to potential price premiums. Producers adding value by cleaning, storing, processing, packaging and delivering corn to local buyers should expect to obtain higher profit margins compared to selling the raw product in traditional commodity markets.

Producers should not discount the importance of developing strong relationships with their clientele or the time and resource demands associated with direct marketing.

Selling milled corn products directly to retail customers, grocery stores, hotels, restaurants and institutions may be more time- and resource- intensive than direct sales to distilleries or mills who will further process, distribute and market the final product, however.

In some cases, customers are looking to buy heirloom, organic or other non-GMO corn varieties. The ability to fill these niche markets often commands price premiums over corn sold in traditional commodity markets [3]. Analysis of the risks and costs associated with the production of non-conventional (heirloom, organic, non-GMO, etc.) varieties should be fully understood before production commences.

Direct marketing corn and milled corn products may present additional direct-sales opportunities for Tennessee grain producers. Distilleries and mills often use a variety of grains in their products, such as wheat, barley, oats and rye. Therefore, as these local grain markets expand, farmers may also have opportunities to supply buyers with other grains produced on their farm.

Conclusion

This publication provides an overview of marketing corn to distilleries, mills and as a value-added, milled food product to retail and wholesale customers. Supplying corn to these markets usually involves a combination of post-production activities, including cleaning, storing, processing, packaging, labeling, shipping and marketing. To enter these markets, producers potentially need up to three TDA-issued licenses and permits:

1. Grain Dealer License (Division of Agricultural Inputs).
2. Food Manufacturing License (Food and Dairy Section of Consumer and Industry Services).
3. Legal for trade scale permit (Weights and Measures Section of Consumer and Industry Services).

In addition, many distilleries ask producers to obtain and provide a certificate of analysis from a specialized laboratory to verify that delivered corn does not exceed the FDA's acceptable mycotoxin levels for grains used in human foods. Producers should analyze the costs, risks and returns of growing and marketing corn for sale to distilleries, mills, retail and wholesale customers prior to commencement of production.

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