



FARM TO SCHOOL program

Tips, Tools & Guidelines
for Food Distribution
& Food Safety

FARM-TO-SCHOOL TEMPLATES: TOOLS FOR PARTICIPATING PRODUCERS AND SCHOOLS

Rodney Malcolm and Anh Vo
Oklahoma State University
Department of Agricultural Economics
Robert M. Kerr Food & Agricultural Products Center

In addition to these tips and resources, two new software programs have become available to assist producers in the planning and financial analysis of FTS program participation: the Produce Calculator and the Farm-to-School Distribution Cost Template.

The Produce Calculator helps farmers determine the amount of produce to be delivered to meet the demands of a school nutrition program. The Produce Calculator allows its users to define the type of produce and, with input from the school regarding the number of meals to be prepared, determine the amount of raw produce needed to meet that demand and cost per serving size to the school.

The Farm-to-School Distribution Cost Template helps producers understand the true costs of produce delivery and assists in the determination of "farm gate" values for their crops. This template allows users to consider and compare different delivery methods for their crops, helping them to make determinations regarding the optimal delivery method(s) for their FTS produce.

The following sections provide a detailed description of these software programs and their applications.

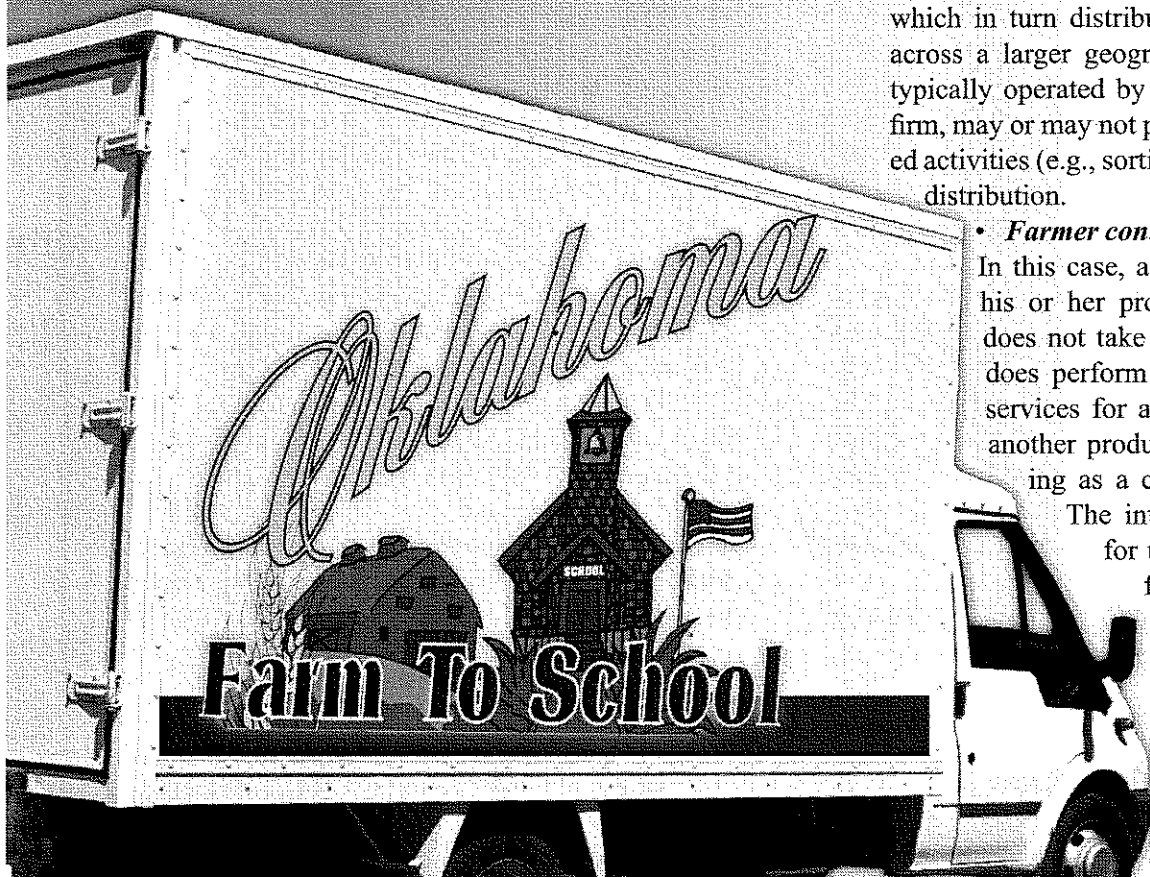
FARM-TO-SCHOOL DISTRIBUTION COST TEMPLATE

The costs of getting food products from the point of production to the point of consumption are often poorly understood. The many options involved in distributing food products are one factor leading to this lack of transparency – both in the understanding of distribution logistics and the assessment of cost efficiencies.

Distribution of produce can occur in many forms or even combinations of forms. Some of the most common distribution methods are:

- **Direct delivery by the producer.** In this form of distribution, the producer maintains direct and complete control over the produce from the farm to the user, which may be the final consumer (e.g. buyers at a farmer's market) or a food service provider (e.g. a school, a restaurant, etc.).
- **Farm-to-warehouse delivery.** For this distribution system, a producer sells and delivers (directly or by contracted shipment) bulk product to a warehouse, which in turn distributes the produce to customers across a larger geographic region. The warehouse, typically operated by a broker or a food distributor firm, may or may not perform some minor value-added activities (e.g., sorting, cutting, packaging) prior to distribution.

- **Farmer contracted use of an intermediary.** In this case, a producer will directly deliver his or her produce to an intermediary that does not take ownership of the produce but does perform certain marketing/distribution services for a fee. An intermediary may be another producer, a group of producers acting as a cooperative entity or a broker. The intermediary serves as an agent for the producer and charges a fee for services rendered. These services may also include activities such as washing, sorting/grading and packaging.



Farm-To-School Distribution Cost Template.xlsx

FARM-TO-SCHOOL DISTRIBUTION COST TEMPLATE

1 Direct Delivery by Farmer-Owned Truck

3	General information	
4	Commodity to be delivered	watermelons
5	Commodity unit (case, pound, carton, etc.)	2-count
6	Selling price per unit (what schools pay)	\$8.50
7	Delivery size, in units	100
8	Labor rate (\$/hr)	\$10.00
9	Unloading time per delivery (minutes)	20
10	Number of deliveries per trip	2
11	Delivery route (miles, round trip)	150
12	Fuel cost (gas or diesel, \$/gal)	\$2.39
13		
14	Vehicle Information	
15	Farm truck fuel economy (mpg)	9.00
16	Vehicle tire costs (set of tires)	\$575.00
17	Vehicle tire life (thousand miles)	45,000
18	Expected maint./repair expenses this year	\$1,500.00
19	Expected depreciation this year	\$2,500.00
20	Expected miles driven this year	10,000
21	Avg speed when making deliveries (mph)	45
22		
23		
24		
25		
26		
27		
28		

Enter "1" if using the IRS standard mileage rate (otherwise leave blank)	
Current IRS standard mileage rate (\$/mile)	\$ 0.55
Operating Costs per Mile	
Fuel costs	\$0.02
Maintenance/Repair	\$0.15
Tires	\$0.01
Depreciation	\$0.25
Labor	\$0.27
Total Operating Costs per Mile	\$0.70
Total Operating Costs per Trip	\$104.31

The Farm-to-School Distribution Cost Template is available in an interactive Microsoft Excel Worksheet. With three distribution options: direct delivery, deliver to warehouse or using an intermediary source, this template is compatible with your specific distribution needs. To download the template visit www.okfarmtoschool.com/resources/fts-distro-foodsafetymanual

It is certainly possible and quite probable for more than one of these distribution methods to be utilized by a producer. For example, a producer participating in a FTS program might make direct deliveries to local schools in his or her farm truck, participate in a cooperative effort to deliver large quantities to larger schools with one or more neighbors (e.g., paying a weight-rated share of trucking fees), and deliver produce to a warehouse that will in turn deliver to foodservice providers statewide. The mix of options can be further complicated if the use of refrigeration or activities such as sorting, cutting and packing are involved.

Each method of distribution has its pros and cons. For a small producer with limited output, one method may be vastly superior to all others. For producers with large quantities of perishable commodities, all options may be necessary to market the produce in a timely manner and avoid losses due to spoilage. Each distribution channel represents a certain set of costs, thus a different set of returns to the producer. The challenge is to maximize profit potential across the available options.

To help producers recognize the costs associated with different distribution channels and the farm-gate margins resulting from their choices, agricultural economists with the OSU Food & Agricultural Products Center (FAPC) developed a publicly-available, spreadsheet-based template that makes cost calculations much easier to deter-

mine and compare. With user-provided information on produce, delivery vehicles, travel distance, number of delivery points, labor costs and fee-based distribution services, the template calculates a producer's operating cost per mile for deliveries (to a school, a warehouse or an intermediary), the total distribution costs per unit of produce, and the farm-level returns for each unit of produce.

One valuable attribute of the template is the ease with which producers can examine the sensitivity of their returns to changes in one or more cost factors and/or a change in the market price for their produce. A person with even a little spreadsheet experience can easily create sensitivity tables by making incremental changes in one cost factor (e.g., fuel price) or the distance traveled and recording the impacts on farm-level returns.

Even seemingly small changes in one cost factor may have great impacts on total distribution costs. For example, the costs of operating a refrigerated truck are greater than a non-refrigerated truck. Backhauls, whether by the farmer or by the intermediary, affect the costs attributed to the delivery of produce (e.g., one-way costs versus roundtrip costs). Even road conditions and their impacts on travel speed and vehicle/tire wear impact distribution costs.

PRODUCE CALCULATOR

Ag Worksheet: Fruits & Vegetables

DIRECTIONS: To use, fill in colored cells for commodity of interest with applicable value.

Item	servings/lb	serving size	meals served daily	lbs needed	price/lb	price/serving
10 Apples	11.8	1/4 cup	1000	2027.5	3.38	0.33
11 Blackberries	7.5	1/4 cup	1000	1333.3	3.38	0.33
12 Raspberries	11.8	1/4 cup	1000	2027.5	3.38	0.33
13 Blueberries	7.5	1/4 cup	1000	1333.3	3.38	0.33
14 Raspberries	11.8	1/4 cup	1000	2027.5	3.38	0.33
15 Blackberries	7.5	1/4 cup	1000	1333.3	3.38	0.33
16 Cantaloupe	4.5	1/4 cup	1000	2222.2	3.38	0.33
17 Honeydew	6.7	1/4 cup	1000	1492.5	3.38	0.33
18 Watermelon	7.5	1/4 cup	1000	1333.3	3.38	0.33
19 Grapes	10.5	1/4 cup	1000	1904.8	3.38	0.33
20 Kale	11.8	1/4 cup	1000	2027.5	3.38	0.33

Item	quarts needed	price/quart	cost per serving
10 Apples	0.0	0.0000	0.00
11 Blackberries	1.2	2.8167	0.14
12 Raspberries	0.0	0.0000	0.00
13 Blueberries	0.0	0.0000	0.00
14 Raspberries	0.0	0.0000	0.00
15 Blackberries	0.0	0.0000	0.00
16 Cantaloupe	0.0	0.0000	0.00
17 Honeydew	0.0	0.0000	0.00
18 Watermelon	0.0	0.0000	0.00
19 Grapes	0.0	0.0000	0.00
20 Kale	0.0	0.0000	0.00

The Produce Calculator is available in an interactive Microsoft Excel Worksheet. It will allow you to determine amounts of produce needed for each order and determine cost per serving. To download the calculator visit www.okfarmtoschool.com/resources/fts-distro-foodsafetymanual

Determining vehicle operating costs

What are the true costs of operating a vehicle? This question has been and remains to be the cause of lengthy debates and detailed research efforts. The type of vehicle, fuel economy, tire costs, insurance expense, expected annual maintenance costs and road conditions all affect the true costs of operation. For some, the best proxy for per-mile operating costs is to use a reported estimate, such as the IRS allowable mileage rate for expenses. For others, the Farm-to-School Distribution Cost Template may be used to establish an operation-specific estimate.

Fuel economy

Fuel economy is probably the easiest and most commonly measured vehicle operating expense: start with a certain level of fuel in the vehicle, drive a specific distance and find out how many gallons of fuel were needed. Stated fuel economy estimates (miles per gallon) for modern vehicles, or owner knowledge of fuel efficiency from operating the vehicle, and a current price of fuel make fuel-per-mile costs easy to estimate.

Vehicle tire costs

Many factors may go into determining the tire costs per mile of travel: style of tire, the amount of highway travel versus non-paved travel, hills and curves versus flat ground and straight roads, tire inflation level, vehicle weight and wheel alignment. The template asks users to consider these factors, but in a simple, straight-forward manner: What would (did) it cost to purchase a new set of tires for your delivery vehicle? How many miles of travel do you expect to get from that set of tires? Although the possibility of road hazards may drastically shorten the useful life of a set of tires, the vehicle's owner can antici-

pate from past experiences roughly how long a set of tires should last.

Maintenance, repairs and insurance costs

Expenses for maintenance and repairs may be accounted for by using annual estimates from manufacturers or auto industry organizations. These estimates are typically based upon the make and model of the vehicle and vary by age of the vehicle. On the other hand, the vehicle owner may base these cost estimates on a budgeted amount for annual maintenance and repairs, taking into account variations in the costs of repairs that may be performed on the farm and those that might require the services of a trained mechanic. Maintenance costs also may include the annual costs of vehicle registration/tags and legally-required insurance coverage. An annual estimate of these costs, divided by the expected number of miles driven for the year, provides an appropriate estimate of these expenses per mile of operation.

Depreciation

The useful life and value of a vehicle is a function of age (years owned) and miles driven. A vehicle with an expected operating life of 10 years is not necessarily worth half its original value after 5 years. Similarly, a vehicle with an expected operating life of 200,000 miles is not necessarily worth half its original value after 100,000 miles of use. While it is possible to estimate vehicle depreciation over time using a straight-line method (value of the vehicle divided evenly over a period of years) or per mile by a straight-line method (value of the vehicle divided by the expected mile-life), these methods may not accurately capture the current depreciation rate of the vehicle.

A more precise method for capturing vehicle depreciation expense is to incorporate both age and miles driven. Most business-use vehicles are depreciated on the books according to the MACRS (Modified Accelerated Cost Recovery System) accounting method. The MACRS method accounts for the fact vehicles lose more value in their early years than in their later years. Older vehicles, because they have already been partially or fully depreciated by the business, do not lose as much market value per year or as the result of having a few more miles on the odometer.

The template allows for either a straight-line or MACRS depreciation method to capture the fixed costs of vehicle ownership. The user inputs the amount of depreciation for the year, whether that be determined by the straight-line or the MACRS method, and the expected miles driven for the year. Older vehicles may have very little or no depreciation expense per year, but may conversely have much higher annual maintenance and repair costs than a newer vehicle.

Determining labor costs

The template allows users to capture the costs of labor associated with making produce deliveries. For producers using hired help to make deliveries, the template requests information about the length of the trip based on miles traveled, driving speed and the time required to drop off produce at each delivery point.

For producers personally making deliveries, labor costs may be accounted for in two ways. If the producer chooses to input the value of his/her time as the labor rate, the computed labor cost represents an opportunity cost, or the value of time that could have been used elsewhere on the farm. However, the producer may choose to treat the delivery activity as being directly related to his/her farm activities for the crop. In this case, no labor costs are estimated by the template. The producer would need to subtract all production costs from the “farm gate” margin provided by the template to determine the returns to his/her direct labor and farm management.

Suggested information sources

The introductory segment of the template suggests a few sources of information for determining distribution costs. In addition to the provided references, the template user also may be able to get more state-specific vehicle operation costs from state agencies such as the state agriculture department, state department of transportation and/or the state department of commerce. The Distribution Cost Template is available in a downloadable format www.okfarmtoschool.com/resources/fts-distro-foodsafe-tmanual.

PRODUCE CALCULATOR

For any FTS program, it is important that the buyers (school nutrition program directors) and farmers communicate effectively and efficiently regarding the quantities of desired produce. Food service providers typically calculate their produce needs in terms of number of servings and the cost per serving. Farmers usually market their fruits and vegetables on the basis of pounds or cases/cartons that represent a set number of pounds. A Produce Calculator program has been developed to help producers and food service providers calculate quantities and costs of various fruits and vegetables needed by a school food program. This spreadsheet-based program calculates poundage needed from a farmer based on the school’s desired number of servings and serving size. This calculator also calculates the per serving cost based on the price of the produce. Conversion calculations for produce have been taken from the USDA Food Buying Guide for Child Nutrition Programs. Use of the program is very simple:

- 1) Provide the number of servings to be prepared, based on 1/4 cup or 3/8 cup serving size, and the price per pound of the selected produce item.
- 2) The Produce Calculator quickly calculates the pounds of produce needed to provide that number of servings and the cost per serving.
- 3) For some items, such as melons, the Produce Calculator can estimate the number of melons to be purchased using a standard melon size/weight. For berries, the Produce Calculator similarly estimates the quantity in quarts of berries to be ordered by the school.
- 4) For larger serving sizes, such as 1/2 cup portions, simply double the 1/4 cup quantities and cost per serving.

This calculator can be useful for schools, colleges/universities, caterers, restaurants, day care facilities and other venues where fresh fruits and vegetables are served. The Produce Calculator is available in a downloadable format at www.okfarmtoschool.com/resources/fts-distro-foodsafetymanual. The Produce Calculator was collectively developed by the following individuals for the Oklahoma FTS program:

Doug Walton

Kerr Center for Sustainable Agriculture
Poteau, Oklahoma

Dawn Holt

Edmond, Oklahoma

Chris Kirby

Oklahoma Department of Agriculture, Food & Forestry
Oklahoma City, Oklahoma