

# Producing Value-added Food Products from Surplus Farm Produce

Renee Threlfall  
Research Scientist -  
Department of Food Science

Amanda L. McWhirt  
Extension Specialist-Hort Crop  
Horticulture

Morgan R. Gramlich  
Graduate Research Assistant -  
Horticulture

Michael R. Thomsen  
Professor -  
Agri Econ & Agri Bus

## Introduction

The viability of small and medium-scale produce operations is often centered on selling to local markets such as roadside stands, on-farm markets, farmers markets and in some cases grocery stores. These markets, and the consumers shopping at these markets, expect high-quality produce in terms of size, shape and freedom from blemishes and decay. Lost revenue from unsold or second-grade produce (edible but unattractive/unappealing) is a concern for small-scale farmers. Since most fresh produce has a short shelf life and must be sold within days or weeks of harvest, finding alternate ways to utilize the produce would be advantageous. One option could be to utilize unsold and second-grade produce to develop new food products.

Value-added food products (VAFP) are foods that have been transformed from their original form to enhance their consumer appeal or processed so they can be sold at a higher price. Adding value can be as simple as processing produce into jams, jellies, sauces or dried herbs. These types of products provide an opportunity for farmers to take unsold or lower-quality produce and transform the produce into products that have a longer shelf life to use for year-round sales. The surplus produce needed for these products could be aggregated from farmer markets (Figure 1), roadside stands or on-farm markets. VAFP have the potential to diversify product offerings, reduce food waste and provide additional revenue

for small farmers. This fact sheet will present best practices, regulations and other considerations for farmers or other operations to consider prior to pursuing VAFP development.



Figure 1. Produce display at a farmers market in Arkansas

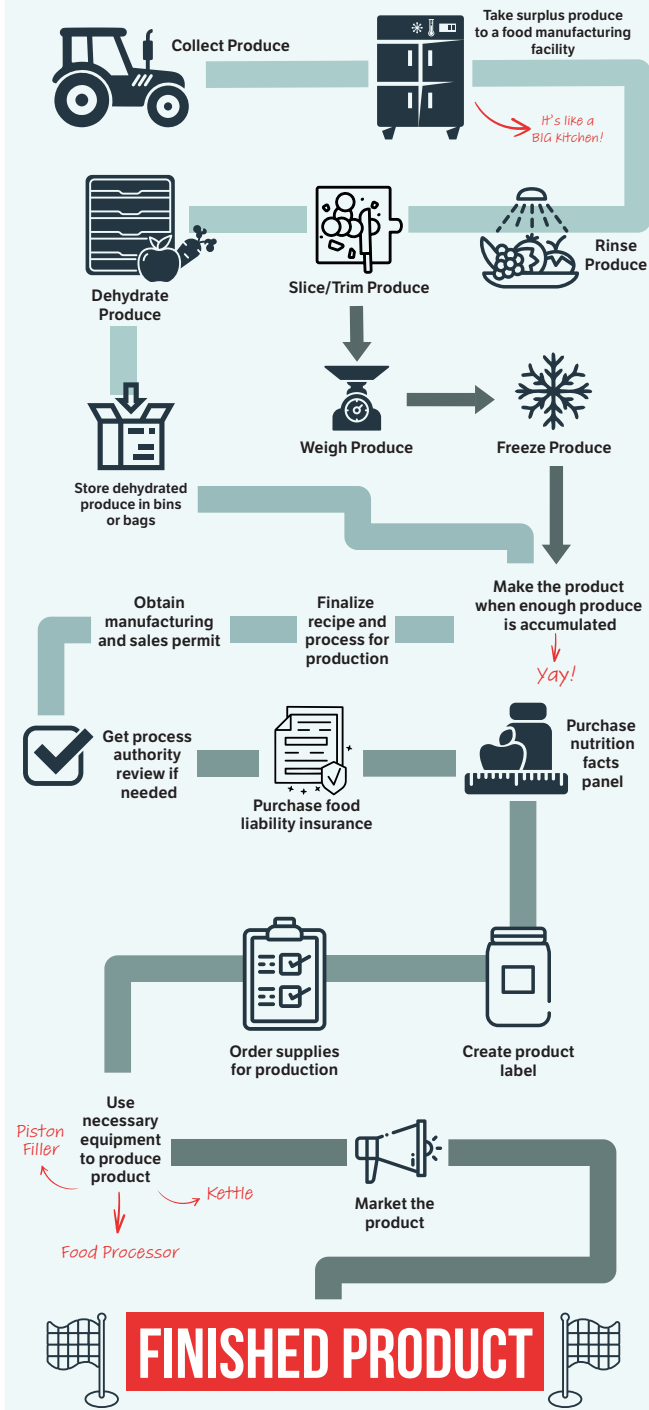
## Identifying Suitable Produce for VAFP Development

Produce suitable for VAFP is produce that can be frozen or dried such as herbs, mushrooms, tree fruit crops (apples, peaches, etc.), small-fruit crops (blackberry, blueberry, etc.), or fleshy vegetables (pepper, onions, squash, zucchini, etc.). Produce that is not suitable for VAFP development includes produce that cannot be dehydrated or that cannot be frozen or stored in long-term refrigeration (watermelon, cucumbers, lettuce, etc.).

*Arkansas Is  
Our Campus*

Visit our website at:  
<https://www.uaex.uada.edu>

# Steps for VALUE-ADDED FOOD PRODUCTION



**Figure 2.** Flow chart demonstrating the steps for value-added food production at a food manufacturing facility

Additionally, large quantities of produce may be required to produce a VAFP. The use of tomatoes for VAFP is a good example of a produce item that can be obtained in large quantities, preprocessed and then frozen for further processing. In contrast, fresh herbs require large amounts of fresh produce because herbs lose 80% to 90% of the weight during drying. The economic costs for a VAFP including labor (collecting produce, prepossessing produce and producing, marketing and selling the product) and equipment (refrigerators, freezers and dehydrators) should be considered prior to starting development. Fact sheet FSA55 “Cost of Developing Value-added Food Products from Surplus Produce” reviews the cost of developing VAFP from surplus produce.

## From Farm to Food Manufacturing Facility or Kitchen

The steps for VAFP are presented in Figure 2. There are several major considerations that should be addressed before the decision is made to transform fresh produce into salsas, jams, sauces or other processed products, and some of these will be discussed. Anyone developing new VAFP should be aware of federal and state regulations for food manufacturing. Some of these regulations will be discussed briefly, but regulations in the United States vary by state.

### Cottage Food Law

In Arkansas, most VAFP sold commercially must be produced in food manufacturing facilities. However, under Cottage Food Law some products can be made in home kitchens and sold directly to consumers at farmers markets, county fairs, special events, online farmers markets or pop-up shops in a retail business. The Arkansas Cottage Food Law allows certain products (i.e. candy, jams, jellies, baked goods and chocolate-covered fruit) to be made at home without a permit from the Arkansas Department of Health. For more information about what products can be made in Arkansas home kitchens versus those that require a manufacturing facility refer to the factsheet on Arkansas’ Cottage Food Law: What the Law Allows (FSP-PC115) (see website link in references). It is important to realize that the Cottage Food Law limits what products can be made, where these products are made, and where these products are sold. If a product does not meet those criteria, then the product must be made in a food manufacturing facility.

### Food Manufacturing Facilities

Food manufacturing facilities are food production facilities (kitchens, food hubs or food co-ops) that have a permit from the Arkansas Department of Health and comply with USDA Food and Drug Administration (FDA) regulations. These facilities have certain structural requirements (floor drainage, three-compartment sinks, hand-washing sinks, surfaces that can be sanitized, etc.). A food manufacturing facility

will be needed to produce VAFP that do not fall under the Arkansas Cottage Food Law. A food product can be sold in any commercial market if it is made in a food manufacturing facility.



**Figure 3.** Value-added food product production at a food manufacturing facility. Arkansas Food Innovation Center is located at the University of Arkansas System Division of Agriculture Food Science Department in Fayetteville, AR.

Options for finding a food manufacturing facility to produce VAFP include renting a facility, building a facility or using a share-used facility. A facility for rental can be found based on the type of product and equipment needed. To build a facility to manufacture VAFP, review the Arkansas Department of Health Plan Review Guidelines for Manufactured/Wholesale Food Establishment (see website link in references).

Farmers, farmers markets, entrepreneurs and others can become clients of food manufacturing facilities. There are several service-fee based food manufacturing facilities in Arkansas. These include:

- The Arkansas Food Innovation Center, Fayetteville, AR
- Arkitchen Commercial Kitchen, Little Rock, AR
- Delta Cuisine: A Southern Kitchen Incubator, West Memphis, AR
- Sharegrounds Certified Kitchens and Distribution Centers, Marshall, McCrory and Rison, AR

These facilities may provide other services that can assist clients interested in developing VAFP. Some facilities can assist with applications for permits, forms for liability insurance, and completing mandatory procedures such as writing a Standard Operating Procedure (SOP), Sanitation Standard Operating Procedure (SSOP), Recall Plan and an Allergen Plan.

### Safety and Sanitation

All food manufacturing facilities require producers to follow Good Manufacturing Practices (GMP) and Best Practices for Food Manufacturing to ensure food safety. The purpose of these practices is to pre-

vent harm from occurring to the end user by ensuring products made are free from contamination, that products are consistent, that manufacturing has been well documented, that personnel are well trained, and that the product has been quality checked. Key components of the practices include personal hygiene of the workers and cleaning work surfaces and equipment.

### Equipment

Produce intended for VAFP development may be collected over a harvest season, stored and then processed during the off-season when the farmer has more time. The opportunity to freeze or dry certain produce may allow the farmer to hold the produce items for later processing but will require refrigeration, freezing or drying equipment. Fruits and vegetables can be frozen for 12-18 months if stored at 0°F or colder.

If the product will be produced on a large scale, the use of a facility with industrial equipment may be warranted. For example, some facilities have kettles large enough to hold and cook the hundreds of pounds of produce required for the production of large quantities of jams, jellies and sauces. Other industrial food equipment can facilitate mixing, dicing, slicing or grinding food for VAFP development (Figure 3). Jar filling machines can be used to speed up the production of large quantities of product. The reduction in time spent processing the product may offset the cost of renting or paying service fees at a food manufacturing facility.

### Handling Produce

Whether a food manufacturing facility or home kitchen is used for VAFP development, the safe handling of produce prior to processing should be emphasized. Produce should be thoroughly washed, trimmed and prepared using safe handling practices. Produce must arrive at the facility or kitchen completely intact. Once at the facility, perishable produce can be pre-processed for freezer storage until it can be processed at a later date (tomatoes, peppers, onions or herbs). Pre-processing steps prepare the produce for long-term freezer storage and include washing, trimming, slicing, dicing and blanching produce before it is stored in food-grade containers or bags and placed in the freezer. Similar steps should be used in home kitchens, and all produce should be clearly labeled with the content, weight and date of processing prior to long-term storage.

### Product Development

Product development involves bringing a product from concept or idea through to market release and beyond. The process of product development takes time and money. If a client starts with a recipe, the recipe might need to be modified to make the food safer or taste better. Then the recipe will have to



be scaled up for production, and more modification to the recipe/formula may be needed. The amount of time and money needed for product development varies by the type and number of ingredients and the methods of processing.

## Product Food Safety

There are also food safety requirements for food production in manufacturing facilities. Some products are required to be heated to a certain temperature for a specific amount of time to ensure dangerous microorganisms are killed. In addition, there are different regulations for products that are hot-filled (container filled with heated product) versus pasteurized (container heated after sealing). Products that will not be refrigerated must have a pH (acidity level) below 4.6 to be considered shelf-stable/food safe. Some products may require additional testing to determine if the sugar content is high enough to ensure the product is safe to consume after processing and during storage. For more information about food product safety refer to the Food Safety and Preservation document from The Arkansas Food Innovation Center (see website link in references). Shelf stable products packed in sealed containers must be reviewed by a processing authority (a person with knowledge and experience to review product formulation and process to ensure the product meets food safety standards) if the product will be sold commercially. In addition, these products have to be filed with the FDA. This is not necessary if the product falls under cottage law or the product is frozen, dried or refrigerated prior to consumption.

## Packaging and Labeling

The type and method for packaging of VAFP should be considered early in the product development process. The size, type of packaging (jars, bottles, bags, cans, boxes, etc.) and material for packaging (glass, plastic, cardboard, etc.) can vary depending on the type of product, the method of production, and how the product will be sold or marketed. Jams, jellies and sauces are typically packaged using 8 oz. or 16 oz. glass jars. However, dehydrated produce may be packaged in food grade, re-sealable plastic bags or containers. Labeling the product should be considered once packaging has been determined. A strong label design can help the marketability of a product. Labels can be designed at home for free, but investing in a professionally designed label may be worth the cost. The FDA has guidelines on the mandatory requirements for label design and layout (see website link in references). The guidelines also cover the nutrition facts panel which is a required element of the label that gives information to the consumer about the nutritional value of the product. Online, fee-based resources are available to help with creating a nutritional facts panel. A Universal Product Code (UPC) might

be needed for the label. The UPC is not a required label component, but it is a barcode on the label used to identify packaged products mainly in retail or commercial markets. The product label should be reviewed by someone familiar with food label requirements prior to printing since printing labels is a major cost. Companies that specialize in food labeling may be the best option when seeking label review to ensure that the label meets the federal requirements for food sold commercially.

## Marketing

Farmers can diversify their product offerings and increase sales through VAFP. Before production of a VAFP begins, market research to determine the economic feasibility of the product should be conducted. For more information on how to calculate the economic feasibility and appropriate pricing of a product, refer to Direct Marketing and Value Added Production (see website link in references). It is important to realize how much consumers may be willing to pay for a given product and ensure that the planned VAFP can be produced and return a profit.

Using appropriate wording when marketing a VAFP can make a product more appealing to consumers. Marketing a product as a locally produced VAFP or stating the product was made using locally sourced ingredients can make the product stand out among competitors. Other tools such as the Arkansas Grown or Arkansas Made programs can be useful in marketing a VAFP. These programs are administered through the Arkansas Department of Agriculture to help promote agricultural products that are grown or made in Arkansas. A farmer or producer can use the Arkansas Grown or Arkansas Made trademarked logos on their products for a membership fee as low as \$30 per year. For more information about the Arkansas Grown or Arkansas Made Programs, visit <https://www.arkansasgrown.org/about-us/>. These marketing programs may make produce or products more appealing to consumers interested in supporting local food systems.

## Conclusion

The opportunity to capture second-grade or unsold produce and process it into a VAFP that can be sold year-round is an enticing idea to many farmers as well as entrepreneurs. Although VAFPs present the opportunity to create new streams of revenue and reduce wasted produce, there are economic considerations. A farmer should identify suitable produce for VAFP development and consider safety standards and product marketing requirements before beginning the production of VAFP.

## Acknowledgments

The development of this factsheet was supported by grants from the Arkansas Department of Agriculture-Specialty Crop Block Grant Program and Southern Sustainable Agriculture Research and Extension (Southern SARE).

## References

Andress, L. and J. Harrison. May 2015. Preserving Food: Canning Tomatoes and Tomato Products (FDNS-E-43-2). The University of Georgia.

Brady, P. Food Industry Concepts. Food Preservation and Safety. The Arkansas Food Innovation Center. <https://cpb-us-e1.wpmucdn.com/wordpressua.uark.edu/dist/1/313/files/2018/06/Food-pres2-1ui-j3gw.pdf>

Food and Drug Administration. Food Labeling Guide. 2020. <https://www.fda.gov/media/81606/download>.

Higgins, Kristin. November 2019. Arkansas' Cottage Food Law: What the Law Allows (FSPPC115). University of Arkansas System Division of Agriculture. [http://www.asuregionalfarmersmarket.org/arkansas\\_cottage\\_food\\_law.pdf](http://www.asuregionalfarmersmarket.org/arkansas_cottage_food_law.pdf)

Olive, R., L. Olsen, K. Draeger, D. Harrison, and H. Peterson. 2018. Farm to Rural Grocery to Wholesale: Backhauling through Existing Infrastructure to Create Local Food Access. Kansas State University Libraries.

Rushing, J. Formulating Dressings, Sauces, and Marinades (FSE 99-21). North Carolina State Extension Service.

Direct Marketing and Value Added Production. 2020. University of Maryland Extension. <https://extension.umd.edu/mredc/specialty-modules/direct-marketing-and-value-added>

Printed by University of Arkansas Cooperative Extension Service Printing Services.

---

**RENEE T. THRELFALL** is a Research Scientist- Department of Food Science, University of Arkansas, Fayetteville, AR. **AMANDA L. MCWHIRT** is Extension Specialist - Crop Horticulture, University of Arkansas System Division of Agriculture, Little Rock, AR. **MORGAN R. GRAMLICH** is a Graduate Research Assistant - Horticulture, Department of Horticulture, University of Arkansas, Fayetteville, AR. **MICHAEL R. THOMSEN** is Professor - Agricultural Economics and Agribusiness, University of Arkansas, Fayetteville, AR.

Issued in furtherance of Cooperative Extension work, Acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture, Director, Cooperative Extension Service, University of Arkansas. The University of Arkansas System Division of Agriculture offers all its Extension and Research programs and services without regard to race, color, sex, gender identity, sexual orientation, national origin, religion, age, disability, marital or veteran status, genetic information, or any other legally protected status, and is an Affirmative Action/Equal Opportunity Employer.