



**Cornell University**  
New York State Agricultural Experiment Station

# Low Acid Foods

## Fact Sheets for the Small Scale Food Entrepreneur

*Published by:*

*The Northeast Center for Food Entrepreneurship at the New York State Food Venture Center, Cornell University,  
<http://www.nysaes.cornell.edu/necfe/>*

*This publication is for educational purposes only. 01/07*

**Cornell University is an Equal Opportunity/Affirmative Action Educator and Employer**

## Low Acid Foods

Over the years we have received many inquiries about the possibility of processing and marketing low acid foods in a small-scale operation. The many food safety and regulatory compliance issues associated with low acid foods present unique opportunities and challenges as a start-up venture.

### Definition

Foods are classified based on their acidity and water availability using two values: pH and water activity. The pH refers to the degree of acidity in a food and it is measured with a pH meter. Foods with a pH above 4.6 are classified as low acid. Examples are meats, milk, eggs, vegetables and formulated products such as soups, baked products and entrees.

Water activity refers to the water in the food that is available (free) to support microbial growth. It is measured with a water activity meter in a scale from 0 to 1. Foods with values below 0.85 are considered non-hazardous regardless of their acidity, because they do not support the growth of harmful bacteria. Examples are dried and semidried products.

### Processing

Low acid foods are closely monitored by regulatory agencies because they can support the growth of many pathogens (microorganisms that pose health hazards) due to their high pH. Typical preservation techniques for these products include pasteurization combined with refrigeration, freezing, dehydration and retort (high temperature – above 212 degrees) canning. In general, regulatory agencies will not allow low acid foods to be manufactured in the home for retail sale; a dedicated processing facility must be used.

**Canning:** Retort canning of meats, vegetables and other low acid foods is not a simple task due to the initial investment in specialized equipment, regulatory compliance, safety issues and required training. Canning is not usually a small-scale operation and represents a very difficult starting point for a food entrepreneur.

**Freezing:** Frozen products represent a viable alternative, although appropriate facilities are needed. In this case, leasing or renting space from a processing facility that has freezing and storing capacity is recommended. Alternatively, a co-packer can manufacture the product for you. In either case, you can assess the feasibility of introducing a new frozen product into the marketplace without a large initial investment. Take into consideration also that frozen distribution and frozen retail space are costly. It could be difficult to open this market for a new specialty product.

*Published by:*

*The Northeast Center for Food Entrepreneurship at the New York State Food Venture Center, Cornell University,  
<http://www.nysaes.cornell.edu/necfe/>*

*This publication is for educational purposes only. 01/07*

**Refrigeration:** Refrigerated products are an option for a short shelf-life food, typically 7 to 14+ days depending on processing, packaging and formulation options. In most cases, the food will need to be pasteurized or otherwise treated to ensure the safety of the final product. This is extremely important if the food is ready to eat (the consumer will not need to cook the product prior to consumption). Specialty products are often displayed in the refrigerated deli section of a supermarket. However, as in the case of frozen products, refrigerated shelf space in retail establishments is limited and can be difficult to obtain.

**Dehydration:** Dehydration is another viable option for low acid products such as dried meats, vegetables, cereals, nuts, and other mixes. The advantages of dried foods include extended shelf-life, no need for refrigeration and the availability of shelf-space at the retail level. Relatively small dehydrators and ovens can be purchased from restaurant equipment suppliers to be used by small-scale processors.

### **Product Safety**

The critical points, such as pH, temperature and water activity, that need to be controlled will greatly affect the processing and packaging techniques chosen to preserve or to extend the shelf-life of a low acid food product. Vacuum packaging (VP), also called reduced oxygen packaging, is often seen as an ideal way to extend the life of a product, but there are a number of serious safety concerns associated with its use. VP is regulated by state and federal regulations and can not be implemented without expert evaluation and approval by an appropriate process authority. Consult with your local regulatory offices before purchasing a VP machine as a special permit is normally necessary.

*Published by:*

*The Northeast Center for Food Entrepreneurship at the New York State Food Venture Center, Cornell University,  
<http://www.nysaes.cornell.edu/necfe/>*

*This publication is for educational purposes only. 01/07*