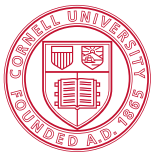

Cornell University
New York State Agricultural Experiment Station

Cheese Production

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,
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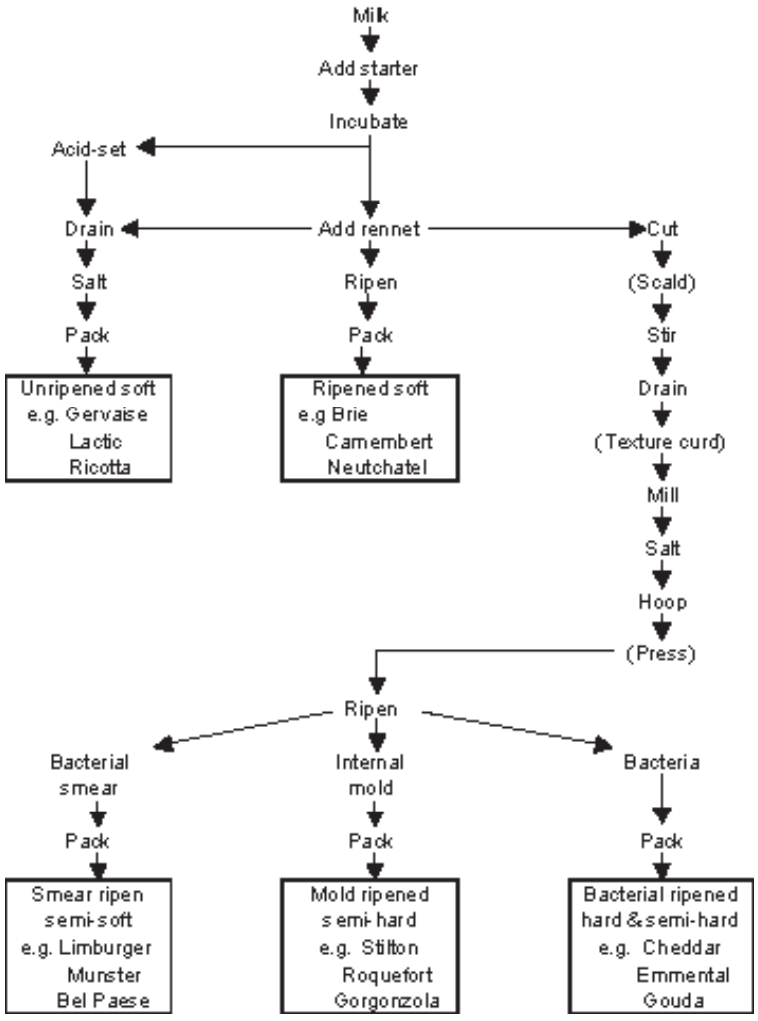
Cheese Production

Cheese manufacturing began in ancient times with the practice of transporting milk in animal stomachs and bladders. Over the centuries, cheese making has been modified and refined. Today, at least 800 different types of cheeses have been identified worldwide. These cheeses may be produced from the milk of any species. Although cows' milk is most commonly used in the U.S. and Western Europe, there is increasing interest in the manufacture of goats' and sheep milk cheese.

All varieties of cheese share a basic production process in which starter cultures of lactic acid bacteria play a key role. The striking differences among various cheeses result from relatively small changes in manufacturing procedure. The following figure represents a simplified procedure for the manufacture of various types of cheese[1]. Steps within parentheses are dependent on the variety being produced.



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Below are suggestions that will help you make a safe and successful product:

1. **Milk:** The milk must be of good initial quality and free from antibiotics. Ensure that the milk is correctly standardized.
   - Unripened cheeses (cream, Neufchatel, cottage, etc.) must be made from pasteurized milk.
2. **Monitor:** You must obtain a thermometer and pH meter to correctly monitor
   - time and temperature of the milk heat treatment
   - the temperature of the milk in the cheese vat
   - the acidity (pH value) during cheese production.

   Cheese legally prepared from raw milk must be held for 60 days at temperatures not less than 35°F before sale to eliminate disease-causing organisms.
3. **Foodborne disease:** Although cheese is generally considered to be a low-risk food, both hard and soft types have been associated with significant outbreaks of foodborne disease in recent years. Major risk factors include:
   - the use of unpasteurized milk
   - insufficient growth of starter microorganisms
   - post-pasteurization contamination from equipment, environment, or personnel.

   Follow the guidelines in the Code of Federal Regulations for your specific cheese type. This information can be found in 21CFR 133 or online at www.access.gpo.gov/nara/cfr (click on "search by keyword and enter the type of cheese).

We hope that your venture into the art of cheese production is successful. Below is a sample of suppliers of starter culture, equipment and/or technical services.

New England Cheesemaking Supply Company
P.O. Box 85
Ashfield, MA 01330
(413) 628-3808
www.cheesemaking.com

ABC Research Corp.
3437 SW 24th Ave.
Gainesville, FL 32607
(352) 372-0436
www.foodingredientsonline.com

Chr. Hansen Ingredient Technology
1595 MacArthur Blvd
Mahwah, NJ 07430
(800) 343-4680
www.chr-hansen.com

Kusel Equipment
820 West Street.
Watertown, WI 53094
Fax: 920-261-3151
sales@kuselequipment.com
www.kuselequipment.com

[1] Varnam, A. H. and J. P. Sutherland. 1994. Milk and milk products: technology, chemistry, and microbiology. Chapman and Hall, New York. p. 277.

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