

# HOW TO MAKE GOAT MILK CHEESES



Different varieties of high quality French soft goat milk cheeses.  
(Source: Goat milk cheese plant, Poitiers, France)



Hard and Semi-hard Types of Mexican Goat Milk Cheeses  
(Celaya, Mexico)

## CHEESEMAKING PROCEDURES OF HOMEMADE STYLE OF HARD GOAT MILK CHEESE

A hard type goat milk cheese can be made at home. The following homemade cheesemaking procedures were introduced at a goat milk cheesemaking workshop conducted by the American Dairy Goat Association:

i) Ingredients needed:

- a. 1 gallon (3.785 L) goat milk
- b. 1/3 cup mesophilic starter culture
- c. 1/2 tablet of rennet (enzyme)
- d. coloring agent if desired
- e. 1 tablespoon salt

## MANUFACTURING PROCEDURES FOR HOMEMADE STYLE HARD GOAT MILK CHEESE

<u>Time</u>	
<u>(hour,min)</u>	<u>Procedures</u>
0.0	Add 1/3 cup starter culture to one gallon of milk in a metal pan which has been heated to 29-30°C (84-86°F), and stir well. Let stand at this temperature with occasional stirring about 1 hr depending on desired acidity (but 30 min is used for workshop purpose).
0.30	Add 1/2 rennet tablet dissolved in 1/2 cup cold water. Stir thoroughly for 3-5 min. Color can be added at this time but not with the rennet.  Cover milk and let it set undisturbed for about 30 min at the same temperature (29-30°C). Coagulation should occur during this period, but if not, let it stand longer.
1.05	Cut curd into 3/8 to 1/2 inch (0.95 to 1.27 cm) cubes. If using a spatula or knife,

instead of a curd cutter, it must be long enough to reach the bottom of the pan. Starting at the far right of the pan, cut the curds into strips from 0.95 to 1.27 cm wide, inserting the knife to the bottom and cutting from back to front. Turn the pan and repeat the operation. Next, holding the knife at about 45° from horizontal and starting at the inch (2.54 cm) wide strips from top to bottom of the pan. Turn the pan and repeat.

Stir the curds slowly for about 5 min. During this time, oversized curds may be found and, if so, cut them to the required size. It can be stirred, but not to mash the curds into pieces smaller than 3/8 inch (0.95 cm). The curds should be the same size, in order to reach the same degree of firmness when heating, which is an important process.

- 1.15      Slowly apply heat to raise the temperature to 39°C for over 20-30 min period. Hold at 39°C for another 15 min, stirring gently every 5 minutes.

Cooking is complete when the curd holds its shape, but falls apart without squeezing. Individual curds will be about the size of a grain of wheat and will have the general appearance of scrambled eggs.

- 1.45      To firm the curd, remove from heat and let curds and whey stand for about 30 min, stirring gently three or four times.

- 2.15      Pour curds and whey into a cheese cloth-lined colander. Thoroughly drain off whey, rolling the curds by alternately raising one end of the cloth and then the other.

Sprinkle one tablespoon salt over the curd, one-half at a time, and work in with hands. Wrap the cheesecloth around the curd, making a ball, and squeeze out as much whey as possible. Then place curds in a cloth-lined mold and press overnight.

Next day:

Remove the cheese from the press, and remove cloth. Air-dry the goat cheese on board or mat in a cool place for 2 to 3 days. Turn daily.

Wax and store at about 4.4°C until optimum flavors are developed. The cheese also can be consumed immediately, if desired without flavor development.

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(Reference: Park, Y.W. and M. R. Guo. 2006. Goat Milk Products: Processing Technology, Types and Consumption Trends. In: Handbook of Milk of Non-Bovine Mammals. Y.W. Park and G.F.W. Haenlein, eds. Blackwell Publishers. Ames, Iowa and Oxford, England. Pp. 74-75).

## **MANUFACTURING PROCEDURE OF GOAT MILK CHEDDAR CHEESE**

Cheddar cheese originated many decades ago in the little village of Cheddar, England from which it spread throughout the world. English Cheddar is crumbly with a pronounced sharp, acid flavor, and a higher salt content. Its American counterpart is more cohesive and waxy in texture with a generally bland flavor.

Strictly speaking, Cheddar cheese may not be legally made from goat milk, because the term “Cheddar cheese” has originated from cheese made only from cow milk. However, Cheddar cheese can be and has been manufactured using goat milk, even if the latter has some problems of attaining the same level of moisture content as well as the firmness in texture of the cheese due to its naturally soft curd body formation and lack of  $\alpha_{s1}$ -casein content in goat milk, which is considered the primary casein to attain firmness of the curd. Nevertheless, the goat Cheddar cheese has been made from caprine milk including at the Georgia Small Ruminant Research and Extension Center, Fort Valley State University, Georgia and other places. The manufacturing procedure for goat Cheddar cheese has been adapted from that of cow milk cheese. As an example of goat Cheddar cheese processing, steps were adapted from the University of

Wisconsin, Madison, Wisconsin, which are shown in the following table.

## MANUFACTURING PROCEDURES FOR CHEDDAR CHEESE<sup>a,b,c</sup>

Step in Making	Time of Step	Minutes to next step	Temperature °F	Acid		Comments
				%	pH	
Add Starter	8:15	30	88	0.16	6.65	70 lbs. strained (use manufacturers guides)
Add Color	8:45	15	88	0.16	--	10 oz
Add Rennet	9:00	12	88	0.17	6.60	30 oz
Coagulation	9:12	18	88	--	--	Vat covered
Cut Curd	9:30	15	88	0.10	--	¼ inch knives
Steam on	9:45	30	88	0.10	--	By heating schedule*
Steam off	10:45	45	102	0.11	6.40	Stir slowly
Drain whey	11:00	30	102	0.13	6.20	8 to 10 inch deep
End drain	11:30	15	102	0.15	6.00	18 inch trench
Pack (1 <sup>st</sup> turn)	11:45	Turn	101	0.17	5.90	Blocks 7 inch wide
Pile 2 high	12:30	curd	96	0.25	5.70	Cut blocks in half
Pile 3 high	1:00	every 15 min	93	0.32	5.50	Smooth ends
Mill	1:30	20	91	0.40	5.45	Smooth silky
Salt	1:50	40	89	0.65	--	25 to 27 lbs.
Hoop	2:30	20	88	--	--	All salt dissolved
Press	2:50	30	88	--	--	Full pressure in 15 min
Press for 5 to 20 hr at full continuous pressure						

### \*Heating Schedule

Minutes from steam on	0	5	10	15	20	25	30
Temperature °F	88	89	91	93	96	99	102

<sup>a</sup>Manufacturing Cheddar cheese from pasteurized milk (Bulletin 464). Research Division, College of Agricultural and Life Sciences, University of Wisconsin-Madison, WI. April 1971.

<sup>b</sup>Cheesemaking is based on 10,000 lbs of milk, 3.5% milk fat: The final cheese is expected 985 lbs cheese with 37-38% moisture and 33% fat.

<sup>c</sup>Actual cooking time may be extended longer for goat milk cheesemaking, since goat milk curd is softer and need more cooking time for more moisture expel from the curds.

(Reference: Park, Y.W. and M. R. Guo. 2006. In: *Handbook of Milk of Non-Bovine Mammals*. Y.W. Park and G.F.W. Haenlein, eds. Blackwell Publishers. Ames, Iowa and Oxford, England. Pp. 76).

**Flow Diagram for Milking  
and Cheese Manufacture Processes**

(Fort Valley University, Georgia, U.S.A.; Reference: Park and Guo, 2006)

**Milking Process**

Drive Goats from Barn to  
Milking parlor

Six Goats per  
Milking

Milking  
Preparation

Machine Milking

Transfer Raw  
Milk

Pre-cooling

Bulk Tank  
Storage at 4°C

**Manufacture of  
Cheese (Monterey Jack)**

Transfer Raw Milk to  
Vat Pasteurizer

Pasteurization  
(62.8°C for 30 min)

Cooling Milk (31°C)

Transfer Milk to  
Cheese Vat

Drain Whey

Wash Curds

Press Cheese

Vacuum Packaging

Storage  
(Aging at 4°C)

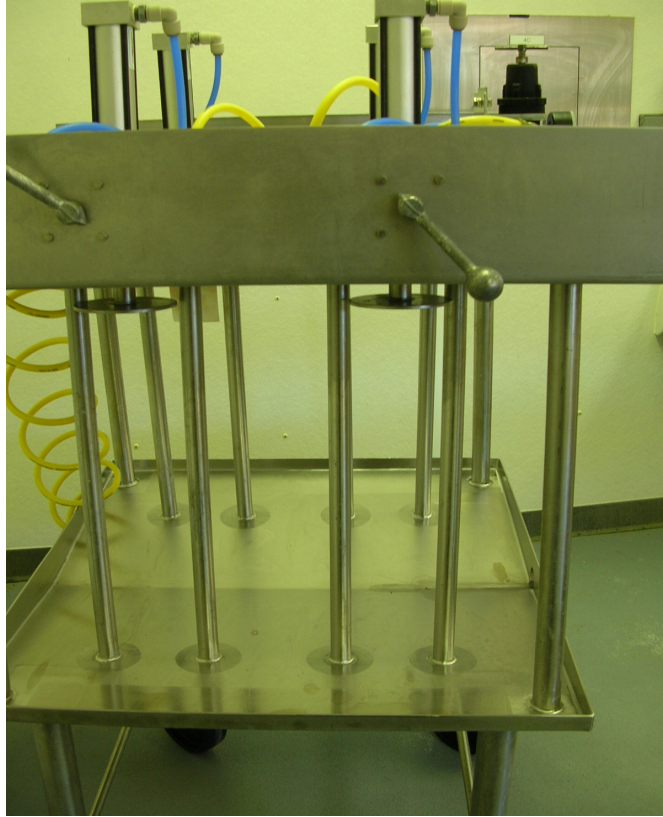




(Cheese Vat. 60 gallon size, Fort Valley State University, Georgia, USA)



(Washing curds with cold water during Monterey Jack Goat Milk Cheese Manufacture, Fort Valley State University, Georgia, USA)



(Vertical Cheese Press for Hard Cheesemaking, Fort Valley State University, Fort Valley, Georgia, USA)



(Placing cheese labels for Monterey Jack Goat Milk Cheese, Fort Valley State University, Fort Valley, Georgia, USA)





(Soft cheesemaking: placing soft goat milk cheese curds in the plastic moulds, Celaya, Mexico)



Transfer of soft curd body of goat milk cheese to the plastic hoops for draining whey in a French commercial goat milk cheese plant:  
(Source: Goat milk cheese plant, Poitiers, France)