



Cornell University
Dairy Foods Extension
Stocking Hall, Ithaca NY

Department:

DOC#:
REV:

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Subject: Gouda Cheese from
Pasteurized Milk

Issued by:

Approved by:

Plant Number:

1.0 PURPOSE

To establish rigid procedures to be followed during the cheese making process for Gouda cheese in at _____ . A strict record of all proceedings shall be made so that food safety/quality issues might be addressed.

2.0 SCOPE

This SOP applies to the production of Gouda cheese produced at _____ and all employees that are involved in the production of this cheese.

3.0 SAFETY & ENVIRONMENTAL CONSIDERATIONS

When working around hot water or chemical cleaners, always use care and follow instructions for use.

4.0 FREQUENCY

This SOP applies anytime Gouda cheese is produced.

5.0 RESPONSIBILITY

- **TASK**

_____ Staff, anyone using plant for cheese production

- **VERIFICATION**

_____ Management

- **PAPERWORK REVIEW**

As needed to address quality or safety concerns, by appropriate managers/regulatory officials including cheese make sheets, vendor lot code keys, batch sheets, sampling records, pH recording sheets, salometer recording sheets, temperature recording sheets, and pasteurization records.

6.0 SUPPLIES/EQUIPMENT

6.1 Supplies

6.1.1 Milk

6.1.2 Appropriate cultures, rennet, calcium chloride, salt

6.2 Equipment

6.2.1 Jacketed cheese vat with paddles (automated)

6.2.2 Cheese vat strainer

- 6.2.3 pH meter
- 6.2.4 Calibrated thermometer(s)
- 6.2.5 Brine tank
- 6.2.6 Molds (_____ molds manufactured by _____)
- 6.2.7 Cheese knives (_____ knives manufactured by _____)
- 6.2.8 Cheese wax
- 6.2.9 Cheese packaging

7.0 PROCEDURE

7.1 Cheese making preparation

A. In a clean and properly sanitized vat, add pasteurized milk volume. Take initial pH reading and record it.

B. Warm milk to 89°F/31.6°C while gently mixing.

7.2 Fermentation

A. Record lot numbers of cultures and calcium chloride on the make sheet.

B. Add culture(s) at the appropriate amounts. See make sheet for standards as mathematical calculations are required based on milk volume for all ingredients. Cultures are added at a rate of _____ gr/ _____ gallons of milk and _____ gr/ _____ gallons.

C. pH measurements must be taken at the intervals specified in the make sheet and recorded to ensure the culture is functioning and there is an increase in acidity. Record this reading on the make sheet. Add calcium chloride. Calcium chloride is added at a rate of _____ ml/ _____ gallons of milk.

D. Ripen for 30 minutes at 89°F/31.6°C with a target pH of 6.57-6.61.

7.3 Coagulation

A. Record lot number of rennet/coagulant on the make sheet.

B. Add rennet (or coagulant of choice) to milk and stir for 2-4 minutes. Maintain temperature at 89-90°F (+/-1°F) to ensure rennet functions at the same level between production lots (enzymatic reactions are temperature sensitive). Rennet is added at a rate of _____ ml/ _____ gallons of milk. Cover the vat. Rennet set takes 30-45 minutes with properly function enzyme. Determining when the curd is ready to cut must be determined and takes expertise and experience.

7.4 Cutting

A. Using a clean and sanitized cheese knife cut the curd first with the horizontal cheese knife the length of the vat.

B. Using a clean and sanitized cheese knife cut the curd next with the vertical cheese knife the length of the vat.

C. Finally, using the vertical knife, cut the curd across the vat. Ensure that all cheese has been cut and a uniform cube size throughout has been obtained. Take a sample and measure pH and record on make sheet.

D. No cooking at elevated temperatures is required. Maintain 90°F/32°C temperature.

7.5 Fore Work

A. Gently stir cut curd for 15 minutes.

B. Allow curd to settle for 3 minutes in preparation of further heating of the curds and whey.

7.6 Pre-draw/Temperature Increase

A. Pre-draw 25% of whey. Dispose of whey in an approved manner.

B. Raise temperature by slowly adding hot water at a rate that raise the temperature of the vat contents by 1°F/-17.2°C for every two minutes for 20 minutes. Bring temperature to 102°F/38.8°C over the last 10 minutes. Temperature of the water added should be around 160°F/71°C.

C. Measure pH and record on make sheet.

7.7 Stir Out

A. Agitate the curd for 40-60 minutes.

B. Measure pH and record on make sheet. Target pH is 6.35-6.45.

7.8 Dipping/Pressing

A. Dip or empty to pre-press within 20 minutes or less, keeping the curd below whey surface.

B. Press under the whey for 15 minutes.

C. Drain whey and press for an additional 5 minutes.

D. Dispose of whey in an approved manner.

7.9 Cutting/Filling

A. Cut into rectangles.

B. Place curd in molds.

C. Measure pH and record on make sheet. Target pH is 6.1-6.3.

D. Cheese tested for coliform and moisture.

E. Samples retained for regulatory authority. Samples must be labeled with an appropriate label with accurate measurements and information. (if preferred, an entire wheel after step 7.12 may be retained as a sample for regulatory authority.)

7.10 Pressing

- A. Press cheese for 15 minutes with no pressure.
- B. Press for 20 minutes at 1.89 psi.
- C. Press for 20 more minutes and 3.78 psi.
- D. Press for a final 20 minutes at 9.46 psi.
- E. Remove cheese from molds.

7.11 Brining

A. Place cheese in brine solution at temperature of 55°F/12.7°C for 72 hours. Brine solution is 21% by volume.

After removing cheese from brine, allow to dry 1-2 days prior to waxing.

7.12 Curing

- A. Coat cheeses with cheese wax.
- B. Move cheeses to 50°F/10°C curing room for 8 weeks.

7.13 Packaging/Distribution

- A. Package for consumer use.
- B. Move cheese to refrigerated storage <45°F/7.2°C.
- C. Distribute product.

8.0 ATTACHMENT/DOCUMENTATION

Cheese Make Sheet, Pasteurization Records, Lot Numbers for any products used during processing, pH recording sheet

9.0 SIGNATURES AND APPROVALS

Role	Name and Title	Signature	Date

SAMPLE