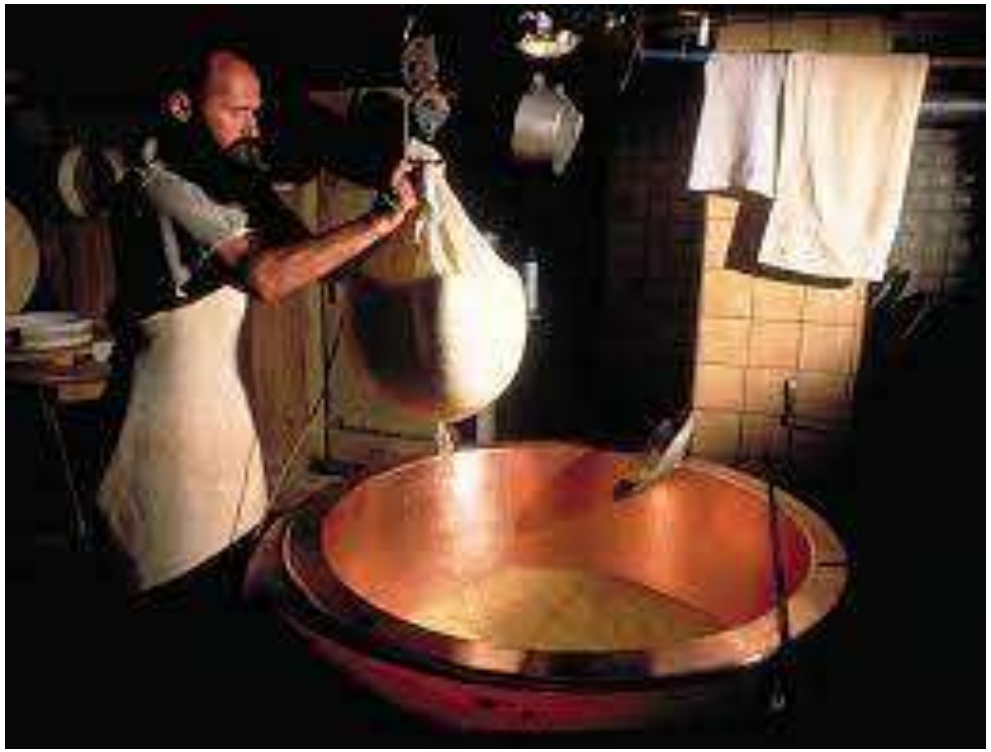
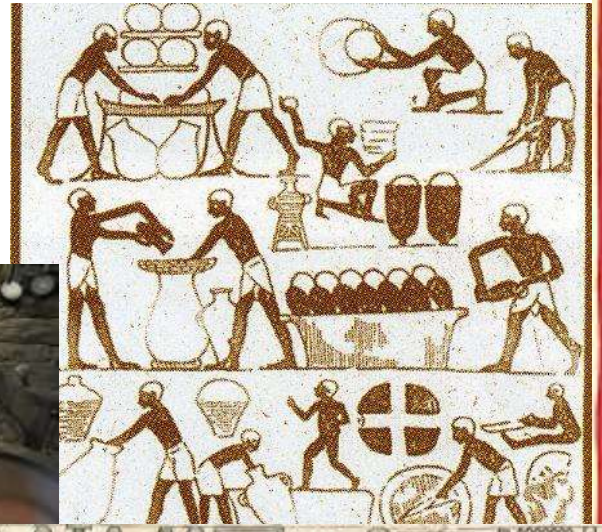
So, you want to make cheese?

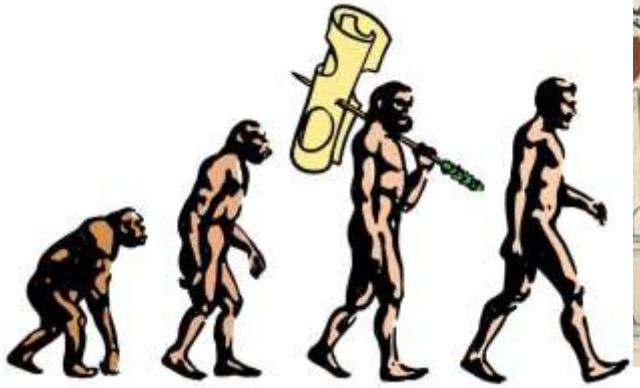
Making Chevre and More

CURT WITTENBERG
(and Larry Stein, *in absentia*)
Cheese Educator and Librarian
Queso Diego:
The San Diego Cheese Club



People have been making cheese for almost 10,000 years





You can do it too!

What cheese can I make?











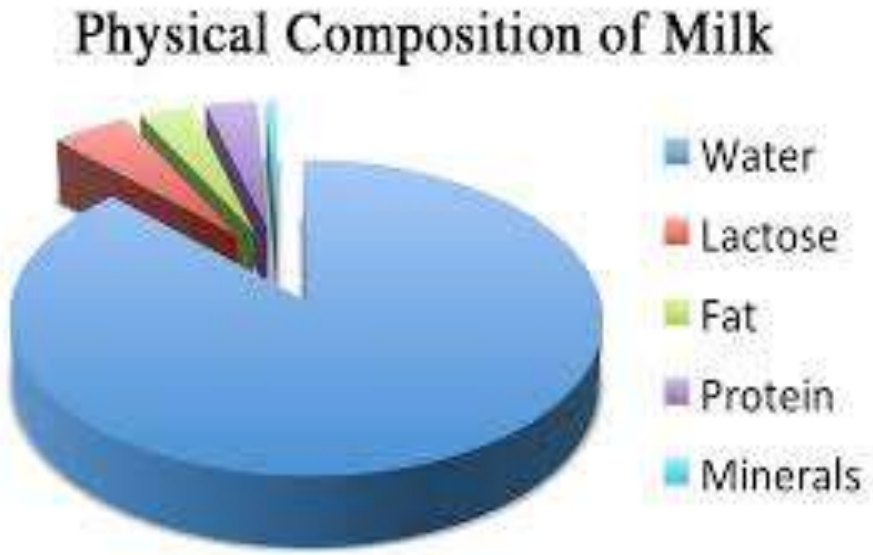



Any cheese!

A little bit of background…

What is Cheese?

- “Average” milk composition (1 G = 8.6 lb):
  - 87.6% water (7.5 lb)
  - 12.4% solids (1.1 lb)
    - 3.7% Lipid (milkfat) (5.25 oz)
    - 8.7% Non-milkfat solids (12.35 oz)
      - 3.3% Proteins
      - 4.7% Carbohydrate (Lactose)
      - 0.7% Ash



- Cheese is primarily the extraction of the solids from milk.
  - Fat and Protein

General Outline of the Cheese Making Process

- Preparing the Milk
- Acidification or Ripening
- Additives
- Gel Production (Curd)
- Curd Processing
  - Draining
  - Pressing
- Rind Preparation
- Aging and Curing

Not all cheeses use all of these steps

Chevre: A Simple Example of Cheesemaking

- Chevre is a fresh goat cheese
- Probably the best first cheese to make
  - Easy
  - Versatile
  - Awesomely delicious
  - You'll impress your friends and guests with this one.

Let’s taste some Chevre…

The Milk

- Fresh milk is great if you can get it.
  - Always from a reputable source!!!!
- Trader Joe's has a good pasteurized Goat Milk
- Use any goat milk as long as it is:
    - NOT Ultra-Pasteurized
- Frozen goat milk can be used to make cheese.
  - Must be frozen properly to avoid coagulation

Today $4.99

What you Need to Start

- 1 Pot or double boiler (preferably stainless)
  - Enough for hold volume with space
- Spoon (preferably stainless)
- Thermometer – fast response
- Measuring spoons
  - 1 tsp down to 1/32 tsp
- ¼ C measuring cup

What you Need to Start

- 1/2 gallon or more goat milk
- Non-chlorinated water
  - Bottled, RO or Distilled
- Culture
  - Flora Danica or other Mesophillic Culture
- Calcium Chloride
- Rennet

Before you Start…

- Sanitation is critical
- Clean your area
- Sanitize your equipment
  - With steam:
    - Boil a little water in your milk pot
    - Put your spoon, measuring cup and teaspoons in the pot
    - Boil/steam for 5 minutes
    - Let items cool on paper towels
  - Or use a food safe sanitizer (e.g. Starsan)

Warming the Milk

- Add some water to the boil pot
- Pour the milk into the top pot
- Add Calcium Chloride
  - Add ¼ tsp CaCl added to 1/8C of distilled water per gal milk
  - Aids curd formation for pasteurized milk and frozen milk
- Set the burner on medium
- Stir the milk and monitor the temperature until it gets to 86°
- Remove the pot from the water bath

Direct fire heating works but requires patience and vigilance!

Ripening

- Sprinkle ¼ tsp of the Flora Danica, or other mesophilic culture, onto the top of the milk and let sit for 5 minutes.
- Stir the culture into the milk for 30 seconds with an up and down motion.
- Cover and let sit for 60 minutes.

Ripening (Acidification)

- The culture will start to metabolize the lactose to produce lactic acid.
  - The lactic acid lowers the pH.
    - Protects from unwanted bacteria.
    - Makes whey protein soluble and the caseins insoluble.
- The culture also produces flavor compounds that add complexity
- Depending upon the cheese you may let it sit for 5 min to 2 hrs.

Mesophilic vs. Thermophilic Cultures

- The bacteria and molds have ideal temperature ranges for growth.
- Mesophilic cultures works best in the 75°-93°F temperature range
  - Chevre, Roquefort, brie, gouda
- Thermophilic cultures like it a bit warmer, 92°-115°
  - Yogurt, parmesan, Swiss, Monterey Jack
- Cheese recipes will recommend a culture and a target temperature.
  - It’s ok if you’re a little over/under but get close
  - Try to maintain the temperatures during the ripening period

Setting the Curd

- Add one (1) drop of rennet to 1/8C of non-chlorinated water.
- Pour onto the milk over the back of a spoon.
- Gently mix by an up and down motion for about 30 seconds.
  - Do not swirl. Let the milk settle.
- Put the lid on the pot and set it a warm spot.
  - You may wrap in a towel or put in an oven
- Let the curd set for 12 to 18 hours.

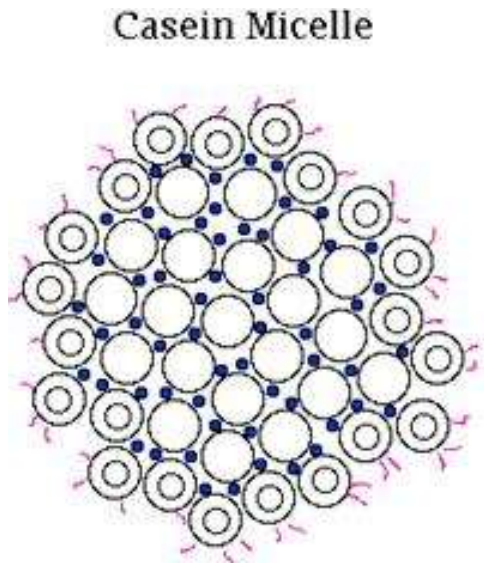
Curd Formation – What's Happening?

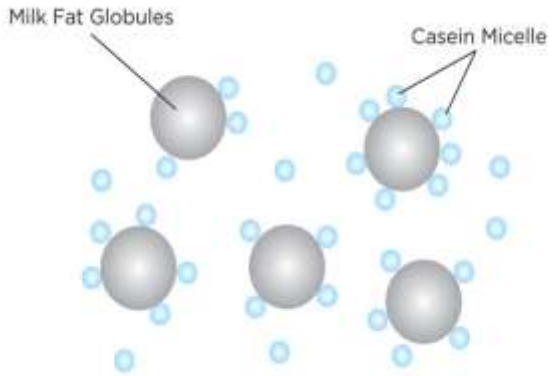
- The 3.3% protein in milk is made up of two components:
  - Whey Protein
  - Casein Micelles
- We want whey to become soluble and expelled from the milk.
- Casein will aggregate and trap the larger milk fat globules.

	Whey Protein 20%	Caseins 80%
pH <4.6	Soluble	Insoluble
Chymosin (rennet)	Soluble	Insoluble
Heat (boiled)	Insoluble	Soluble

Caseins

- Casein in milk has protruding hair-like branches
  - These are called k-Caseins
  - In this form they are soluble (hydrophillic)
- Rennet is an enzyme that “clips” the k-Casein hairs
  - The modified Casein tends to aggregate (hydrophobic)
- The when aggregating the Casein traps fat
  - The casein with trapped fat is called a micelle





Before starting the next phase…

- You'll need a few items to process and drain the curd:
  - A stainless steel spoon
  - A curd cutter, knife or pastry knife (not needed for chevre)
  - A colander and vessel to collect liquid
  - Butter muslin
    - Finer mesh then cheesecloth
    - About 24" x 24"
  - Hook, if you are hanging the bag

Different process, Different cheese

Depending upon what you're making, you'll treat the curds differently.

- For many fresh cheeses you just scoop and drain.
- "Cutting the Curd" is very common.
- Cut into cubes from 1/4" to 1"
- The purpose of cutting is to allow whey to be released.
- The smaller the cut, the more whey released, the drier the curd.

The Curd

- After 12-18 hours, take the lid off the pot.
- There should be a clear yellowish liquid on top. This is the whey.
- Gently pour off a bit of the whey. You can keep it for other uses.
- Test the curd for a “clean break”

The “Break”

- Use the end of a knife or curd cutter to make a small cut in the curd.
- When you move it aside you should see some whey fill in the gap.
- The scar will remain after you remove the knife.

Scoop the Curds into the Cheesecloth



Let’s make cheese!

- Take one large cup and one small cup
- Take one toothpick
- Turn over the larger cup and poke about 30 holes in the bottom with the toothpick
- Poke an additional row or two of holes in the lower white area around the outside of the cup.
- Nest the larger cup in the smaller one.

Let’s get some curd…

- Get one square of cheesecloth
- With your fingers in the center of the cheesecloth, push it to the bottom of the larger cup
  - Push around the edges so it covers the bottom
- Make sure the larger cup is nested in the bottom cup
- Collect about ½-⅔ cup of curd from our curd server
- The curd will immediately start draining to the bottom cup

One approach to draining

Draining the Curds…

- Let the curds drain for a minimum of 6 hours
- A couple things happen:
  - Expelling whey from the curd mass
  - This makes the cheese a bit drier.
  - The bacteria is still working on the cheese
    - Develops a bit more acidity, tartness
    - Flavor

For the same process, I do this:

Let’s taste a simple drained Chevre

For the same process, you will do this…

- Drain the curd for 4-6 hours
  - Empty the lower cup occasionally so the whey stays below the bottom of the larger cup
- Carefully flip the cheese
  - Lift the cheesecloth
  - Turn the cheese
  - Lower back into the cup
- In the morning, turn again

Now is the time for decisions…

Make a soft, spreadable cheese

- If you would like a spreadable cheese,
  - Remove the cheese from the cup and place in a small container
  - Add ¼-½ tsp salt (~2%) and mix well
  - Refrigerate and eat, as is, or add herbs, spices, or other flavorings

Shapes can also be made from the salted or flavored cheese, if it is solid enough to hold its shape

Let’s taste a spreadable
Fresh Strawberry Chevre

Make a solid, cutable cheese

- If you would like a solid, cutable cheese,
  - Salt the top of the cheese with ⅛ - ¼ tsp salt
  - After about 6 hours, turn again and salt the other side
  - Remove from cup and let dry for 24 hours turning occasionally
  - Eat, as is, or put herbs, spices or other flavoring on the outside
- Your cheese will be about 2-3 oz when done

Let’s taste a cutable Chevre with Zata’ar or Black Pepper and Lemon Zest

Some ideas for flavors

- Chevre is a great base for other flavors
  - Plain
  - Herbes de Provence
  - Blackberry jam
  - Sriracha with habanero
  - Chopped dates
  - Lemon Zest and Honey
  - Roll into a log and cover with flowers
  - Stuff into chilies
- Endless options with this cheese

Use different processes to get different cheeses

- Putting cheese in a variety of forms
- Draining, pressing, stretching
- Each treatment has a different effect and is used to make a particular cheese.

Make your own Chevre…

Just add ½ gallon goat milk for 1 lb

Butter Muslin
(Cheesecloth)

Flora Danica
(Mesophilic culture)

Calcium
Chloride

Rennet

Comments/Questions?


QUESO DIEGO
THE SAN DIEGO CHEESE CLUB
Flavor Inspiration:
Star Spangled Chevre

Red Infusions: Vibrant & Bold

SWEET	SAVORY & SPICY
Dried Cranberries/Cherries: Tart sweetness directly balances chèvre's tang, adds texture. **Balsamic Glaze:** Its deep, concentrated sweetness and acidity echo chèvre's tang, adding complexity. **Candied Orange Peel (finely minced):** Aromatic sweetness cuts through the chèvre's richness.	**Sun-dried Tomatoes (chopped):** Umami-rich and slightly sweet, their concentrated flavor adds savory depth and chew. **Smoked Paprika/Chili Flakes:** Adds earthy warmth and color; chili flakes with gentle heat. **Roasted Red Peppers (finely diced):** Mild, sweet, and smoky depth with a pleasant, soft texture.

White Infusions: Elegant & Aromatic

SWEET	SAVORY & SPICY
Vanilla Bean Paste: Aromatic and subtly sweet; sophisticated warmth rounds out chèvre's tang. **Honey:** Classic pairing. Perfectly offsets chèvre's acidity; provides a lovely contrast. **Toasted Coconut Flakes:** Adds a subtle tropical sweetness and delightful crunch.	**Garlic/Onion Powder:** Deep, savory foundational flavors that complement chèvre's earthiness without adding moisture. **Fresh Herbs:** Finely minced chives, dill, parsley, thyme deliver earthy notes, classic brightness. **Fresh Horseradish (grated):** Provides a pungent kick beautifully tempered by the creamy cheese.

Blue Infusions: Unique & Intriguing

SWEET	SAVORY & UMAMI
Blueberries: Fresh, dried or preserves lend sweetness and slight tartness are a classic match. **Butterfly Pea Flower Powder:** Vibrant blue color, but with subtle earthy notes. **Crushed Juniper Berries:** Lends a subtle, piney, slightly citrusy sweetness that is unique.	**Finely Chopped Black Olives:** Their briny, slightly bitter notes create a sophisticated contrast. **Blue Cheese Crumbles:** Sharp, pungent notes of blue cheese are softened by the creamy chèvre, *Use sparingly!* **Herbes de Provence:** Aromatic blend with lavender hint gives unusual floral decadence.