Chocolate

Chef Jennifer M. Denlinger, PhD, CCC, CHEP

Objectives

- Learn what chocolate is.
- Determine the rules for chocolate labeling.
- Differentiate between different types chocolate.
- Discuss the methods for tempering chocolate.

History & Origins

XOCOLATL

(Origin of the word Chocolate)

Aztecs Making Chocolate

Aztec Name for Chocolate

XOCO = Bitter

ATL = Water

History & Origin

Theobroma cacao

Genus Species Name for the Cocoa Tree

THEOBROMA = Food of the Gods

CACAO = Cocoa

Chocolate Inventions

- 1728 Churchman – Engine to grind cocoa
- 1829 Van Houten – Machine to separate chocolate liquor into cocoa butter and cocoa powder
- 1842 Fry & Sons added vanilla and sugar to chocolate creating the first popular chocolate bar
- 1876 H. Nestle & D. Peter – Invent milk chocolate
- 1880 R. Lindt – Conching Machine
- 1900 Milton Hershey sells Carmel Factory for $1 million to build Hersheyville

Cocoa growing countries

Chocolate Production

Chocolate comes from the fruit (cocoa pods) of the *Theobroma cacoa* tree.

These trees grow 10-20° N or S of the equator.

1. The cocoa pods are **harvested** and split open to expose the cocoa beans.
2. The cocoa beans are removed from the cocoa pods and left to **ferment**, typically covered in banana leaves.
3. The beans are cleaned and **dried** in the open air.
4. The next step is to **roast** the cocoa beans.

Chocolate Production

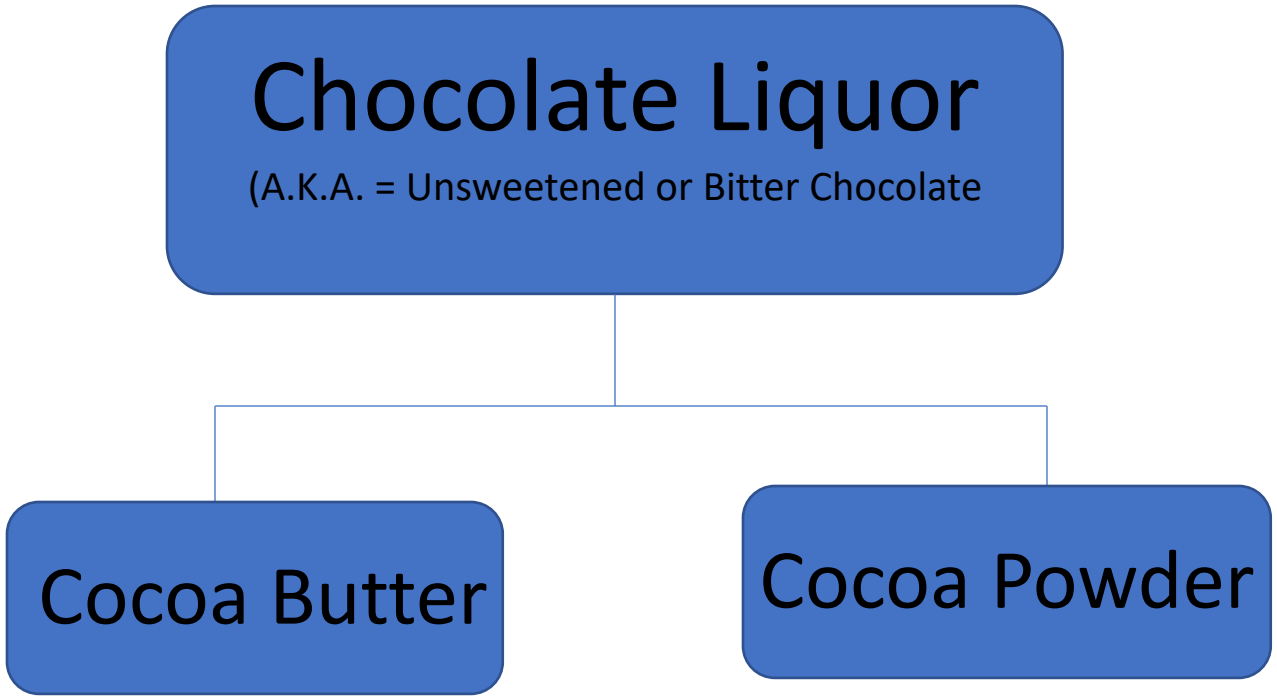
5. The **beans are blended** to specification.
6. Next is **“winnowing”** = the beans are crushed and the outer shell is removed to extract the center known as the NIB. Nibs consist of cocoa butter and cocoa solids.
7. The **nibs are crushed** into a liquid called Chocolate Liquor (first press).
8. The **Chocolate liquor is pressed** in a hydraulic press to extract the cocoa butter. The round mass of cocoa solids that remains is called a presscake.

   (Presscake ground up = cocoa powder)

   (Cocoa powder can be *Dutch processed* to reduce acidity)

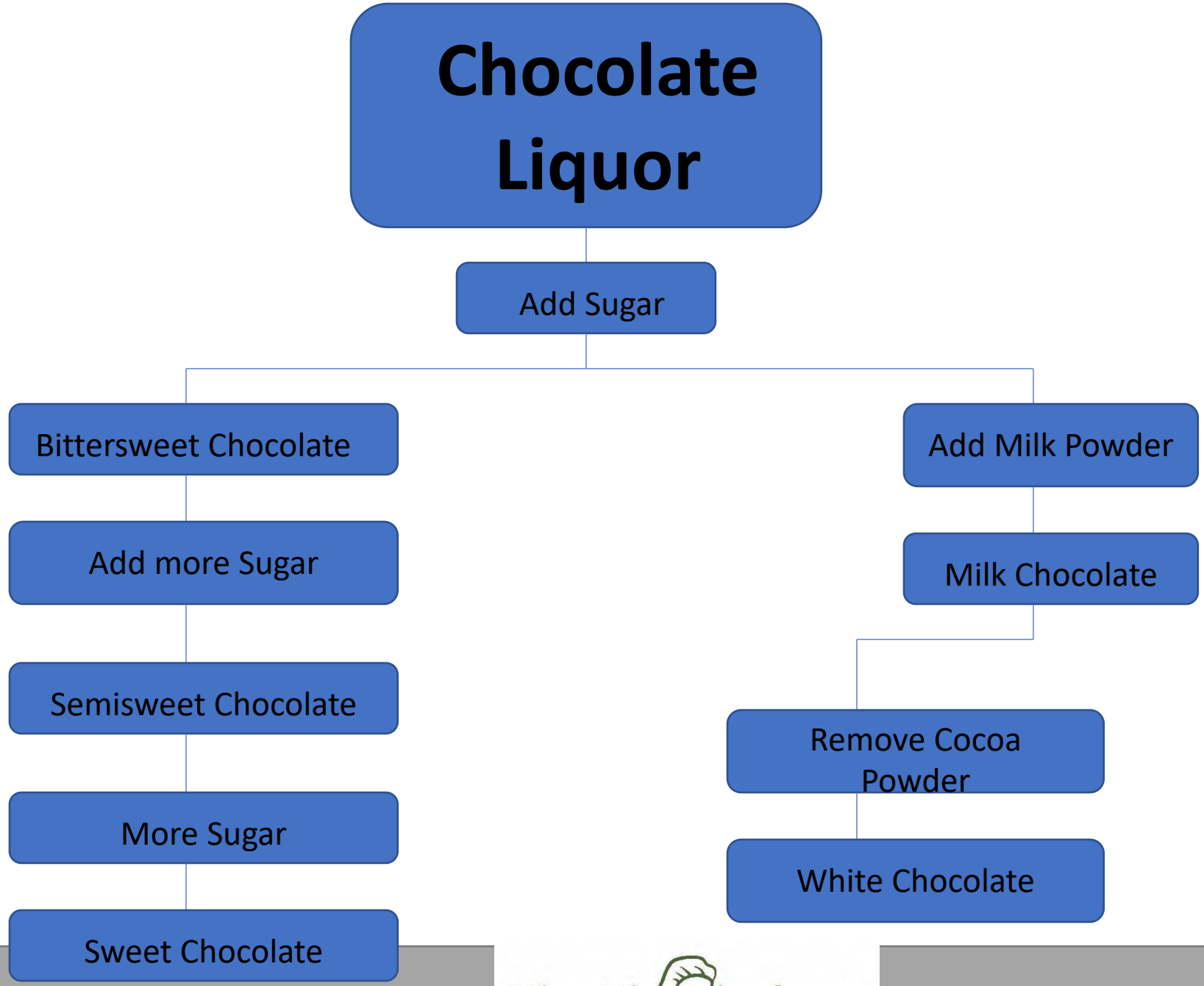
Chocolate Production

9. Next, they **blend the ingredients** to produce various chocolates. Cocoa powder and cocoa butter are blended with sugar and milk powder to create milk chocolate candy bar.
10. **Conching** is the process of crushing and blending melted chocolate with huge rollers to create a smooth velvety texture. This process also allows for any acids or volatile ingredients to evaporate off and it continues to develop flavor from chemical reactions started in the roaster.
11. **Tempering** is the last step before molding the candy bar. This step emulsifies the cocoa butter with the cocoa solids.



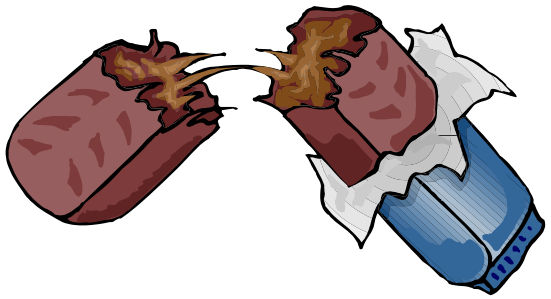
COUVERTURE

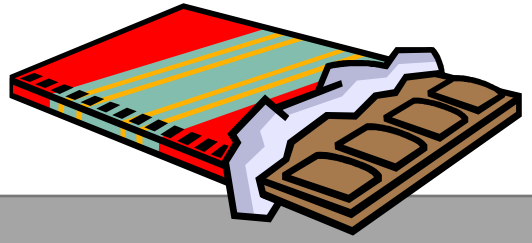
32% or more Cocoa Butter

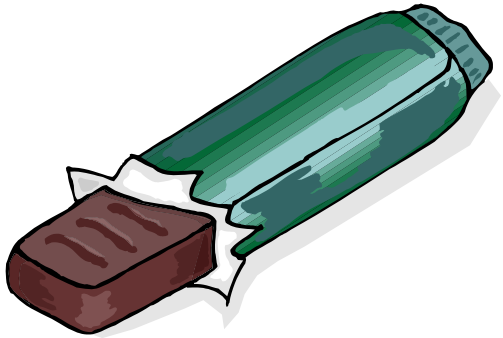


Who Eats The Most Chocolate?

- Swiss 21.5lbs each
- Norway 17.6lbs each
- England & Belgium 16.25lbs each
- Holland, USA, Germany, Ireland, Denmark 11.5lbs each
- France 8.8lbs each
- Italy, Greece, Spain, Portugal 4.4lbs each







Tempering

- Tempering is the process of melting, seeding, agitating and manipulating the temperature of chocolate.
- Tempering is necessary to align the fat crystals in a way which prevent *fat bloom*, give strength, and provide shine.

Tempering

Chocolate **must** be tempered if you are preparing it for dipping, coating, and molding

OR

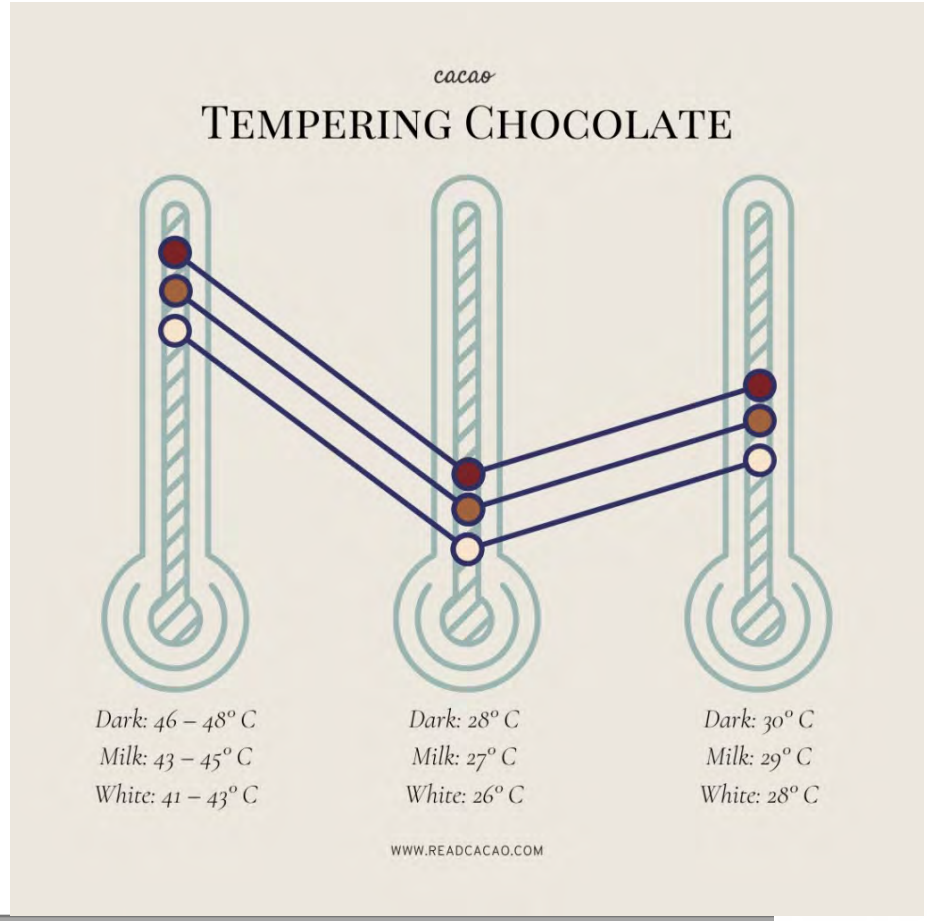
If the chocolate is going to stand alone.

(* If it is going to be blended with other fats or liquids, such as ganache, it does not need to be tempered)

Tempering Methods

- Seeding Method (using block, chips, or shavings)
- Tabling Method

Tempering Chocolate



Tempering Dark Chocolate:

Melting, Cooling & Re-warming temperatures

- Dark Chocolate
  - Melt to 115-120°F
  - Cool to 80-84°F
  - Re-warm and hold at 86-89°F*

*to avoid dark chocolate from going out of temper do not heat above 90°F

Tempering Milk Chocolate:

Melting, Cooling & Re-warming temperatures.

- Milk Chocolate
  - Melt to 110-115°F
  - Cool to 78-82°F
  - Re-warm and hold at 85-88°F*

*to avoid milk chocolate from going out of temper do not heat above 89°F

Tempering White Chocolate:

Melting, Cooling & Re-warming temperatures

- White Chocolate
  - Melt to 110-115°F
  - Cool to 78-82°F
  - Re-warm and hold at 86-87°F*

*to avoid white chocolate from going out of temper do not heat above 88°F

Signs of Good Tempering

- The Test – dip a piece of paper or utensil in the chocolate.
  - If tempered, the edges start hardening within one minute, complete test should harden within five minutes at room temperature (do not cool in refrigerator)
- It Should:
  - Set up quickly
  - Have a nice shine, free from streaks
  - Release easily from a mold
  - Maintain it’s shape and have a good “Snap”

Important Facts To Remember

- **Real Chocolate** must contain cocoa butter. Chocolate for tempering can only be thinned-out with cocoa butter.
- **Fake Chocolate** has vegetable fats instead of cocoa butter. These can be called:
  - Coating chocolate
  - Compound chocolate
  - Pate a glacier
  - Writing chocolate (has simple syrup or water added)
  - Candy Melts

Enemies of Chocolate

- **Avoid Excess Heat**
  - Use indirect heat, i.e. double boiler or microwave on low
  - Avoid scorching on sides of bowl >>boil water first, then place bowl on top and reduce to a very low flame
- **Avoid Water** when melting chocolate
  - Avoid excessive steam when melting
  - Wipe bottom of bowl after melting

Chocolate Storage

- Chocolate should arrive “in temper”
- To remain “in temper” it must be kept cool at 72°F

also

- Keep away from sunlight, humidity and odor

Review

- White chocolate has what removed?
- What does the % on chocolate mean?
- What is an ideal temperature to store chocolate?
- What is the “bloom” on chocolate?
- Which type of cocoa powder has less acidity?
- What are the two ways to temper chocolate?