



COLORADO
FARM TO TABLE
FOOD SAFETY



Candy Making at High Altitude

High Altitude Adjustment for Candy

For each 1,000 feet above sea level, reduce the finish temperature by 2°F.

This adjustment allows the candy maker to control the degree of evaporation necessary to achieve the proper sugar concentration for the desired end product.

Successful candy making requires achieving the desired degree of sugar concentration for a quality product. Recipes that work at sea level will need temperature adjustments when being prepared at higher elevations, directly related to changes in the boiling point.

At sea level, the boiling point of liquids is 212°F, but for every 500 feet *above* sea level, the boiling point decreases by 1°F due to less resistance on surface molecules. For example, at 5,000 feet water boils at 202°F, which is 10 degrees less than at sea level. The lower the boiling point, the quicker evaporation occurs, so at higher elevations, this faster loss of water can result in a sugar mixture either becoming too hard or grainy if the recipe is not adjusted for the altitude.

Candy thermometers typically measure from 100 - 400°F, should come with a clip to attach to the side of the pan, and be easy to read. They come in variety of styles and are a worthwhile investment for the candy maker. Newer models contain non-toxic alcohol (blue-colored liquid) and digital brands can come with alarm features to signal when the desired temperature is reached. For those without a thermometer, cold water tests can help determine the various stages of sugar cookery, and are shown in Table 1.

Caution: Care should be taken if using an older, mercury-based candy thermometer. If breakage occurs, it must be treated and disposed of as hazardous waste, for which safe and quick clean-up facts can be accessed at:

<http://www.atsdr.cdc.gov/mercury/docs/ResidentialSpillCleanup.pdf>.



Table 1. Sugar Cookery with High Altitude Adjustments

Product	Cold Water Test	Color of Solution	Finish Temperatures:		
			Sea Level	5,000 ft.	7,500 ft.
Cream candies and filling	Soft Ball	Clear	234-240°F	224-230°F	219-225°F
Chew candies	Firm Ball	Clear	244-248°F	232-238°F	227-233°F
Pull candies, fillings and frostings with egg whites	Hard Ball	Slight color	250-260°F	241-258°F	235-253°F
Toffees	Soft Crack	Yellowish	270-284°F	260-280°F	255-275°F
Brittles	Hard Crack	Light golden	300-308°F	290-300°F	285-295°F

About Sugaring in Candies

Grainy candy is often a result of sugar crystals finding their way into the candy as it cooks or cools. This applies to both types of candies— the crystalline such as fudge, divinity and fondant and the non-crystalline such as taffy, caramel, and brittle.

Tips to Avoid Sugar Crystal Formation:

If the recipe calls for butter (and remember to use unsalted butter), grease the sides of the saucepan before adding other ingredients.

1. First bring the liquid to a boil.
2. Remove pan from the heat and add sugar.
3. Return pan to the heat, cover with a lid, and leave long enough for the mixture to boil and develop steam to wash down the crystals from the sides of the pan.
4. Uncover the pan to permit evaporation.
5. Do not stir after uncovering, but continue cooking until mixture reaches desired temperature (measured with thermometer) or concentration (using cold water test).
6. Allow candy to cool undisturbed. Any agitation will cause the sugar to crystallize and result in sugary candy.
7. For non-crystalline candies (i.e. taffies, caramels and brittles), hold the saucepan within an inch or so of the cooling pan when pouring. Never scrape the last of the syrup.

For more information on high altitude food cooking, the downloadable CSU Extension **High Altitude Food Preparation Guide** is available at: <http://www.ext.colostate.edu/pubs/foodnut/p41.pdf>.