

# High Altitude Cookery

Prepared by MARIE TRIBBLE

*Extension Food and Nutrition Specialist, Oregon State University, Corvallis*

The elevation in Oregon ranges from sea level to 11,245 feet on Mount Hood in the Cascade Range. Cooking in the high altitude areas of the state creates problems for many newcomers who have had no experience in preparing food at high elevations.

The higher the elevation, the lower the atmospheric pressure because air becomes thinner at higher altitudes and exerts less pressure. As pressure drops, water boils at lower temperatures. Each 500-foot increase in altitude causes a drop of about 1° F in the boiling point. At the higher altitudes in Oregon, boiling water is relatively cool. More time is required for food to reach the desired internal cooking temperature (doneness) because heat, not boiling, cooks the food. Newcomers find that boiling and leavening are the two most common problems in high altitude cookery.

## Foods Cooked in Liquid

**Cooking vegetables.** Food, especially vegetables, does not cook as fast at high altitudes as at sea level. General rules for cooking vegetables are:

✓ Small vegetables may be cooked whole, but larger ones should be cut up for faster cooking.

✓ Add vegetables to rapidly boiling water and bring water quickly back to the boiling point. Regulate heat to keep water boiling rapidly throughout the cooking period.

✓ Cook in a small amount of water and use a tight-fitting lid on the saucepan.

✓ Cook for required time after the water has started boiling.

✓ Cook only until tender to conserve both minerals and vitamins.

At 5,000 feet green cabbage, Irish potatoes, parsnips, rutabagas, squash, sweet potatoes, and turnips require from 4 to 11% more cooking time.

Mature carrots may require more than twice the time needed at sea level.

**Frozen vegetables.** Commercial or home frozen vegetables cook faster than fresh ones. Usually only a minute or two needs to be added to the time designated for sea-level cooking. Cauliflower and other dense vegetables will require additional cooking time. Solid pack vegetables, such as green leafy ones, should be partially thawed before cooking. Follow the general rules for cooking fresh vegetables when cooking frozen ones.

**Eggs.** Each homemaker must do her own testing with soft or hard cooked eggs to obtain the desired results. "Three-minute" eggs may take up to five or six minutes. Use a saucepan with a tight-fitting lid and a small amount of water.

**Meats.** Generally, one-fourth more time may be required when simmering or braising meat at 5,000 feet than at sea level. Sea-level time may be used for meats cooked in the oven because altitude changes do not affect this method of cookery.

**Pressure saucepans.** Pressure built up within the sealed container raises the temperature of boiling water in a pressure saucepan. At most altitudes, the cooking time of foods prepared in this manner should be increased no more than one to two minutes over sea-level timing.

## Deep Fat Frying

At high altitudes, the lower boiling point of water in foods requires lowering of temperatures for deep-fat frying. A definite number of degrees cannot be given because of the variety of foods fried. A general recommendation is to decrease the temperature two to three degrees for each 1,000 feet elevation. For example, a recipe for croquettes

gives a temperature of 375° F; when frying at 5,000 feet elevation, use a temperature of 350 to 360° F.

## Surface Cookery

At high altitudes lower the temperature setting for surface unit cooking. For example, when frying meat use medium low heat instead of medium or medium high to prevent meat from burning.

With electric skillets, use a lower temperature than the one given in the instruction book.

## Food Preservation

**Freezing vegetables and fruits.** When blanching vegetables and fruits, such as apples, rhubarb, and apricots, increase the time recommended in freezing charts by one to two minutes.

**Canning in water bath.** High-acid fruits and vegetables may be canned safely in a boiling water bath. Increase the processing time one minute for each 1,000 feet above sea level if the processing time is 20 minutes or less; increase time by two minutes per 1,000 feet if processing time is more than 20 minutes.

**Pressure cooker canning.** Non-acid fruits and vegetables always should be processed in a pressure cooker. At high altitudes, increase the pressure one pound for each 2,000 feet above sea level. This means that at an altitude of 2,000 feet it takes 11 pounds of pressure instead of the 10 pounds of pressure used at sea level.

**Jelly cookery.** A jelly, candy, or deep fat thermometer is necessary for making good jelly. With the thermometer, take the temperature of the boiling water. Record this temperature. Cook the jelly mixture to a temperature of 8° F higher than the boiling point of water.



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## Candy and Frostings

The cooking temperature for all frostings and candies must be lowered from sea level requirements. The faster loss of water at high altitudes causes

these mixtures to be too concentrated. Depending on the type of sugar mixture being cooked, products may be sugary or hard. Lower the temperature by 1 degree F for each 500 feet in elevation above sea level.

### Cookery Chart

Product	Cold water test*	Sea level	2,000 ft.	5,000 ft.	7,500 ft.
Creamy candies and filling .....	Soft ball	234-240° F	230-236° F	224-230° F	219-225° F
Chewy candies (caramels) .....	Firm ball	242-248° F	238-244° F	232-238° F	227-233° F
Pulled candies, divinity, fillings, and frostings with egg whites .....	Hard ball	250-268° F	246-264° F	240-248° F	235-253° F
Taffies, butterscotch....	Soft crack	270-290° F	266-286° F	260-280° F	255-275° F
Brittles .....	Hard crack	300-310° F	296-306° F	290-300° F	285-295° F

\* Drop about  $\frac{1}{2}$  teaspoon of boiling syrup into one cup of cold water and test firmness of mass with fingers. Soft crack separates into hard but not brittle threads. Hard crack separates into hard and brittle threads.

## Baking

**Cakes.** Usually it is not necessary to modify cake recipes up to the altitude of 2,000 or 3,000 feet. Above this elevation it is often necessary to adjust recipes slightly for certain ingredients. In making very rich cakes at high altitudes, it is sometimes necessary to reduce shortening by 1 or 2 tablespoons. On the other hand, the amount of egg

may be increased at high altitudes to prevent the cake from being too dry and too tender. Repeated experiments will give the best results.

With all leavened baked foods, it is usually best to increase the recommended temperature by 25 degrees when cooking at an altitude over 3,500 feet. Use a lower temperature when using oven glassware.

### Cake Recipe Adjustment Chart

Adjustment	3,000 feet	5,000 feet	7,000 feet
Reduce baking powder: For each teaspoon, decrease.....	$\frac{1}{2}$ teaspoon	$\frac{1}{3}$ to $\frac{1}{4}$ teaspoon	$\frac{1}{4}$ teaspoon
Reduce sugar: For each cup, decrease .....	0 to 1 tablespoons	0 to 2 tablespoons	1 to 3 tablespoons
Increase liquid: For each cup, add .....	1 to 2 tablespoons	2 to 4 tablespoons	3 to 4 tablespoons

Try the smaller adjustment first. If the cake still needs improvement, use the larger adjustment the next time.

Cakes without fat are leavened by air which is blended into eggs while beat-

ing. Beat eggs for a shorter time at high altitudes to give less leavening to the batter. For angel food cakes, beat the whites just until they form soft peaks. In sponge cakes, beat the egg or

eggs (yolk) only until slightly thickened.

Commercial cake mixtures are available for high altitudes.

**Cookies.** Cookies baked from sea-level recipes may need the minimum reduction in baking powder and sugar or the addition of liquid to improve quality (see Cake Recipe Adjustment Chart).

**Yeast breads.** Yeast doughs rise in a shorter time at high altitudes. Dough reaches its maximum height and stops for a short period before reaching its breaking point and falling. The dough should be turned and folded before reaching this point. As soon as dough remains dented when pressed with the finger, turn and fold.

Some people prefer to cut the yeast down to one-fourth cake or package per loaf; others prefer to reduce the proofing time. More liquid, less yeast, and a longer fermentation period is a good general rule to follow. If too much yeast is used, the dough gets too light before the gluten has time to develop. Flour dries out quickly, so more liquid is usually necessary. Do not add more flour than is necessary to handle the dough. When using less yeast, the first fermentation period should be about 2 hours, or until pressed dent remains in dough. After punching down, let dough ferment about 30 minutes, by which time it should be ready to shape into loaves.

**Biscuits.** Add a tablespoon of milk for each cup of flour to improve the quality of biscuits.

**Muffins.** Reduce sugar by one teaspoon if product is not up to standard.

**Quick breads.** Slightly more liquid may be desirable if bread seems to dry excessively in baking.