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High Altitude Recommendations for Electric Programmable Pressure Cookers

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Stove-top pressure cookers have been used for decades. Electric Programmable Pressure Cookers (EPPCs) are relatively new to the market (Carter, 2011). EPPCs use a pre-set pressure regulator while a stove top pressure cooker uses a weighted gauge.

Boiling Point of Water		
Altitude	Celsius	Fahrenheit
Sea Level	100°	212°
2900 ft.	97°	206.6°
4600 ft.	95°	203°
5600 ft.	94°	201.2°
7700 ft.	92°	197.6°

Electric Programmable Pressure Cooker	High	Low
Cuisinart CPC-600	15 psi	5 psi
Deni 9760	10 psi	5 psi
Fagor 670040230	9 psi	5 psi
Nesco PC6-25P	10 psi	5 psi

EPPCs have two pressure settings, high and low. The United States Department of Agriculture states that "at high altitudes, the pressure cooker is an essential kitchen tool. By cooking under pressure you are in effect increasing the atmospheric pressure and therefore, increasing the boiling temperature of water. Food will cook faster and more thoroughly" (USDA).

The altitude in the State of Utah varies from 2900 feet in Washington County to over 7,000 feet in San Juan and Wayne Counties (Carlson, 2011). "As altitude increases and atmospheric pressure decreases, the boiling point of water decreases. To compensate for the lower boiling point of water, the cooking time must be increased. Turning up the heat will not help cook food faster. No matter how high the cooking temperature, water cannot exceed its own boiling point — unless using a pressure cooker. Even if the heat is turned up, the water will simply boil away faster and whatever you are cooking will dry out faster" (USDA).

Utah State University Extension tested four of the most popular brands of 6 quart EPPCs at varying altitudes.

All four EPPCs were tested in St. George (2860 ft.), Logan (4535 ft.), Heber (5600 ft.) and Heber Valley Camp (7700 ft.). These elevations represented the majority of the altitudes where people live in Utah.

The instruction manuals provided with each EPPC were followed to cook one batch of each food type at each altitude. Carrots, potatoes, beans, chicken, and a combination of foods in a beef stew were tested to determine the optimal cooking time at each of the four altitudes. A Data Logger was used to record the operating temperature in the EPPC.

The following procedures were used in each EPPC to test the cooking time:

Baby Carrots--One pound of medium baby carrots, 1 cup of water and a Data Logger were placed in each cooker. Each EPPC was programmed according to manufacturer's directions.

Potatoes--Four 4" potatoes, quartered, 1 cup water and a Data Logger were placed in each cooker. Each EPPC was programmed according to manufacturer's directions.

Dry, unsoaked beans--One cup of dry beans, 4 cups of water, 2 tsp. of oil and a Data Logger were place in each cooker. Each EPPC was programmed according to manufacturer's directions.

Soaked beans--Beans were soaked in 2 cups of water overnight and drained. One cup of soaked beans, 1 cup of water, 2 tsp. of oil and a Data Logger were place in each cooker. Each EPPC was programmed according to manufacturer's directions.

Chicken thighs--Seven chicken thighs with bone in and skin on, 1 cup of water and a Data Logger were placed in each cooker. Each EPPC was programmed according to manufacturer's directions.

Stew--1 ½ lb. of 1" beef cubes and 2 Tbsp. of oil were browned in each cooker. After browning, the Data Logger was placed inside. Each EPPC timer was set to pressure for 5 minutes. When the audible beep sounded the EPPCs were then quick released and opened. One tsp. salt, ¼ tsp. pepper, ¼ tsp. paprika, and 1 pkg. brown gravy mix were added and stirred. Four 4" potatoes cut into 1 ½" cubes, ½ lb. baby carrots , 1/2 cup of chopped onion and 1 ½ cups of water were added to the beef with the Data Logger. It was set to pressure for 10 minutes. When cooking time was completed it was quick released.

The following table shows the test results and recommendations for the food types at each altitude.

	2900 ft.		4600 ft.		5600 ft.		7500 ft.	
	10 psi	15 psi	10 psi	15 psi	10 psi	15 psi	10 psi	15 psi
Carrots	no change	reduce time	no change	reduce time	add time	reduce time	add time	reduce time
Potatoes	no change	no change	no change	no change	no change	no change	no change	no change
Dry, unsoaked beans	no change	no change	no change	no change	no change	no change	add time	no change
Soaked Beans	no change	reduce time	add time	reduce time	add time	reduce time	add time	no change
Chicken thighs	add time	add time	add time	add time	add time	add time	add time	add time
Beef stew	no change	no change	no change	no change	no change	no change	no change	no change

Based on the results of this study, it is recommended that consumers increase cooking time when using electric programmable pressure cookers. Add 2 to 3 minutes at first, then quick release pressure and check for doneness. Repeat if needed. This is especially important when cooking meat. A meat thermometer should always be used to verify a safe internal temperature has been reached. It is recommended that above 5000 ft. only 15 psi EPPCs should be used.

References

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