



SURVIVAL PAPER #SP09-2

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Homemade Baking Powder

By Ken

Commercial baking powder consists of baking soda, one or more acid salts (cream of tartar and sodium aluminum sulfate) plus cornstarch to absorb any moisture so a reaction does not take place until a liquid is added to the batter. Most baking powder used today is double-acting which means it reacts to liquid and heat and happens in two stages. The first reaction takes place when you add the baking powder to the batter and it is moistened. One of the acid salts reacts with the baking soda and produces carbon dioxide gas. The second reaction takes place when the batter is placed in the oven. The gas cells expand causing the batter to rise. Because of the two stages, baking of the batter can be delayed for about 15-20 minutes without it losing its leavening power

Note: The general rule of thumb for amount of baking powder in recipes: 1 to 2 teaspoons (5-10 grams) of baking powder leavens 1 cup (140 grams) of flour.

Common low-temperature acid salts include cream of tartar (potassium bitartrate), calcium acid phosphate calcium acid citrate, or sodium pyrophosphate.

High-temperature acid salts are usually aluminum salts, such as calcium aluminum phosphate or sodium aluminum sulfate (alum). Concerns of possible Aluminum toxicity caused Aluminum salts were phased out of most baking powder formulations in the 1980's.

Substitution for 1-teaspoon commercial baking powder:

Note: Begins to react immediately when it is added to moist batter, so it must be baked immediately.

- A. 1/4 teaspoon (1.25 grams) baking soda, 1/2 teaspoon cream of tartar plus 1/4 teaspoon of cornstarch
- B. 1/4 teaspoon (1.25 grams) baking soda with 2 teaspoons of vinegar, citrus juice,

- C. 1/8 teaspoon (0.75 grams) baking soda with 3 tablespoons (18 grams) natural cocoa powder (not Dutch-processed).
- D. 2 teaspoons (10 grams) baking soda to 1 cup molasses
- E. 1 teaspoons (5.0 grams) baking soda to 1 1/4 c Brown sugar
- F. 1 teaspoons (5.0 grams) baking soda to 1 cup maple syrup
- G. 1/2 teaspoon (2.50 grams) baking soda for every cup of honey used
- H. 1 teaspoons (5.0 grams) baking soda to 2/3 c. orange juice
- I. 1/4 teaspoon (1.25 grams) baking soda plus 1/2 cup (120 ml) of an acidic ingredient:
 - a. buttermilk, sour milk, sour cream or yogurt

However, if the mixture is acidic, baking powder's additional acids will remain unconsumed in the chemical reaction and often lend an unpleasant chemical taste to food. High acidity can be caused by ingredients like buttermilk, lemon, yoghurt, citrus, or honey. When excessive acidity is present, some of the baking powder is replaced with baking soda.

Once a can is opened, fresh baking powder should be good for 3 to 6 months.

To test baking soda's effectiveness: mix 1/4 teaspoon baking soda and with 2 teaspoons of vinegar the mixture should bubble immediately

I am glad to see this confirmed, I have tested baking powder stored in my basement for 9 year old and found it functioned perfectly. Ken

Effect of long-term storage on baking powder functionality

Baking powder is widely used to leaven baked products. The industry standard for baking powder shelf-life is eighteen to twenty-four months, but little information is available on baking powder functionality when stored beyond this time. A longer shelf-life would prove beneficial in certain situations, such as personal food storage, disaster relief efforts, and space missions.

The objective of this research was to determine the effect of long-term storage on baking powder functionality

Six samples of double-acting baking powder in original commercial packaging were obtained from donors and two fresh samples were purchased. Samples ranged in age from 0.25-29 years and were stored in cool (15-25 °C) and dry conditions. Percent moisture was determined gravimetrically. Baking powder samples were reacted with 100% phosphoric acid in a closed vessel and the total carbon dioxide evolved was measured using a CO₂ extraction line. Biscuits were made following standardized procedures and measured for height, diameter, and surface crumb color.

Moisture content of baking powder samples ranged from 1.4-3.2%. Total CO₂ ranged from 18.8-21.9% of sample weight and did not significantly decrease over storage time. Average biscuit heights ranged from 3.0-3.4 cm, with the control made without baking powder averaging 2.1 cm. The average volumes (calculated from the average measured heights and diameters) ranged from 66-79 cm³, with the control averaging 47 cm³. Average height and volume did not decrease over storage time. Mean L*a*b* color values for biscuits ranged from 66.0-70.5, 4.0-7.4, and 25.9-31.2, respectively, with control biscuits averaging 70.6, 1.5, and 18.6, respectively.

Under optimal storage conditions, it appears that baking powder retains its functionality as a leavening agent for many years and can be included in applications requiring long-term food storage.

Session 99F, Quality Assurance: General
2004 IFT Annual Meeting, July 12-16 - Las Vegas, NV

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http://ift.confex.com/ift/2004/techprogram/paper_25989.htm

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