ARTICLE

Baking Ammonia: The Other White Leaving Agent

September 1, 2004

According to the ubiquitous "Food Lover's Companion" by Sharon T. Herbst, baking ammonia is a chemical leavening agent that is considered "the precursor of today's baking powder and baking soda." It has also been known as ammonia bicarbonate, ammonia carbonate, ammonium bicarbonate and hartshorn in various circles and at different points in time. Traditionally, baking ammonia was a by-product of hartshorn, which used to be obtained by grating or calcining the horns of harts, which in modern times we know as male deer.

Other chemical leavening agents did not become commercially available until the 1850s, which may in part explain why baking ammonia is more commonly called for in traditional, old-world recipes. Even so, baking ammonia has certain unique characteristics that can make it a preferred choice as a chemical leavener for some recipes in modern baking.

Today, baking ammonia is commercially available as a chemical, the ammonium salt of a carbonic acid ((NH4)2CO3). It is available either as lumps or powder. If it comes in lumps, it should be crushed into a very fine powder before using in any formula. This can be done with a mortar and pestle or a rolling pin. Baking ammonia has a tendency to evaporate upon exposure to air. Therefore it should be stored in an airtight container.

A unique dossier

When exposed to heat and moisture, baking ammonia will quickly turn into ammonia, carbon dioxide and water, all of which are sources of leavening in baked goods. As opposed to baking soda and baking powder, baking ammonia doesn't need an acid or alkaline substance in order to react. Some sources claim that baking ammonia is unlike baking soda and baking powder, because baking ammonia needs to be dissolved in water before adding to a dry product. Even so, some recipes that call for baking ammonia do not require mixing it with water first.

The following characteristics of baking ammonia distinguish it from baking soda and baking powder:
· Not very reactive at room temperature -- i.e., batters and doughs made with baking ammonia have a good bench tolerance;
· Reacts rapidly in the presence of water and heat;
· Increases uniformity and spread in cookies;
· Increases browning;
· Provides for a crisp, porous crumb;
· Develops a very strong odor during baking that will dissipate once the product is cooked above 140?F;
· Adds an ammonia off-flavor to still-moist baked goods.

The ammonia off-flavor that can be produced through use of baking ammonia in moist products is one disadvantage of this chemical leavening agent. For this reason, baking ammonia should never be applied in formulas for items that are large and/or have a high moisture content, e.g., muffins, biscuits, cakes or soft and moist cookies.

Despite this disadvantage, baking ammonia remains a good choice when used in a way that makes it possible for the ammonia gas to bake out. For example, baking ammonia is particularly suitable as a leavening agent for low-moisture products (less than 3% moisture in the baked product) with large surface areas that are baked at high temperatures. Good applications include crackers, biscotti and small, dry cookies. Baking ammonia can also be used in pâte à choux to give it an extra measure of "puff."

In fact, baking ammonia has some unique advantages over other chemical leavening agents for baking certain kinds of cookies. A small amount of baking ammonia in cookies will increase pH, which in turn weakens the gluten. The result in the finished product is more spread and tenderness while creating a coarser, more-open crumb that quickly dries to a crisp. Compared to other leavening agents, the crispness will last longer when using baking ammonia. In addition, the good bench tolerance of baking ammonia makes it particularly suitable for stored cookie doughs.