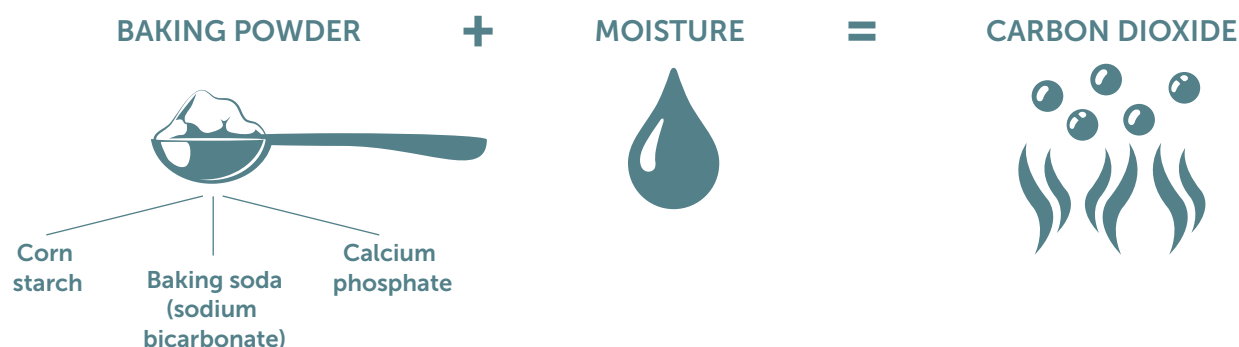


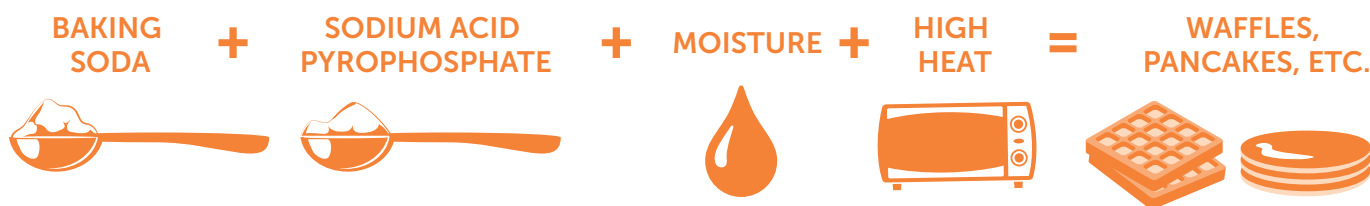
SPOTLIGHT: LEAVENING AGENTS AND THE ROLE OF PHOSPHATES

A leavening agent is a substance that triggers a chemical reaction that causes a baked product to rise. The most well-known examples include yeast, baking soda (sodium bicarbonate), and baking powder (acid + base + filler such as corn starch). Yeast is a biological leavening agent that leavens the dough by fermenting sugars in the dough into carbon dioxide and ethanol. On the other hand, baking soda and baking powder are chemical leavening agents that create CO₂ gas and steam (water).

Baking powder, a dry leavening agent, is a mixture of a weak alkali (e.g. baking soda) and a weak acid (e.g. calcium phosphate, potassium bitartrate, sodium acid pyrophosphate) and a bulking agent (e.g. corn starch). Baking powder works by releasing carbon dioxide gas into a batter or dough through an acid-base reaction, causing bubbles in the wet mixture to expand and thus leavening the mixture. The type of acid required in a baking powder depends on the type of product being made and the critical timing of the leavening action.



An acid in baking powder can be either fast-acting or slow-acting. A fast-acting acid, such as calcium phosphate, reacts immediately in a wet mixture with baking soda at room temperature, while a slow-acting acid, such as sodium acid pyrophosphate, produces a very controlled release of the carbon dioxide with the majority of the leavening action occurring in reaction to heat (baking). The slow-acting leavening acids are critical for the commercial production of baked goods such as organic frozen waffles and refrigerated doughs, whereas fast-acting leavening agents work well for quick breads and mixes that are prepared at home.



The only substances on the National List that function as slow-acting leavening agents are yeast and sodium acid pyrophosphate. Yeast, however, is extremely slow, and not appropriate for quick bread applications. Therefore, if an organic handler wants to make a refrigerated or frozen prepared cereal-based product that requires a slow-acting leavening agent, the only allowed option available that will work is sodium acid pyrophosphate. Conventional food manufacturers often use sodium aluminum phosphate as a slow-acting leavening agent. However, there are health concerns over aluminum consumption, and sodium aluminum phosphate is not on the National List.