HERSHEY CENTER FOR HEALTH & NUTRITION®

Baking with Cocoa: How to Maintain Flavanol Antioxidants

Maintaining cocoa's heart healthy compounds in finished products depends on leavening agents used

Research from The Hershey Company shows using baking powder rather than baking soda in a chocolate cake mix preserves the product's antioxidant activity and flavanol content. Choosing baking powder over soda resulted in a shorter cake and a lighter color.

The health benefits of flavanol antioxidants in chocolate have received much recognition in recent years, with positive findings from a number of studies impacting on consumer awareness. Chocolate manufacturers are using high cocoa content (over 70%) as a means of differentiation, and cocoa has also received attention for its potential in functional food applications.

The study by Hershey, in collaboration with scientists from Brunswick Laboratories, reports that the choice of other ingredients is vital to maintain the flavanol and procyanidin content of cocoa, and provides key information to other formulators, not just of chocolate cakes, but other antioxidant-rich cakes.

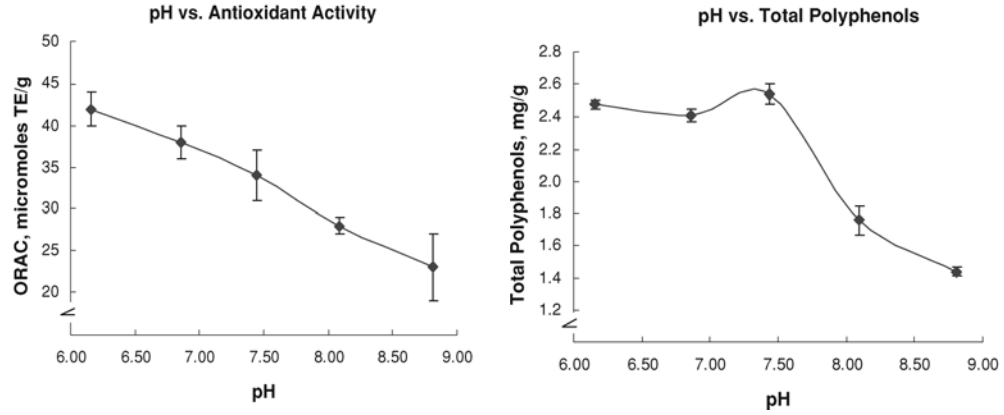
Antioxidant activity was quantified along with the levels of total polyphenol, flavanol monomers, and their oligomers (procyanidins) in typical cocoa-containing recipes and in several commercial cake mixes. Hershey's Natural Cocoa was used in all products.

While excellent recoveries of antioxidant activity, polyphenol, flavanol monomers, and procyanidins were observed in chocolate frosting, hot cocoa drink, and chocolate cookies, ranging from 86 to over 100 percent, the chocolate cake displayed poor recoveries, ranging from 5 to 54 percent for antioxidant activity.

When baking soda was used as the leavening agent it was noted that the pH of the mix increased, and the color darkened. The commercially available chocolate cake mixes (which contained baking soda) were found to have high pHs, above pH 8.3, and had virtually no monomeric flavanols after baking.

When baking soda was replaced with baking powder, pH of the product decreased to 6.2, and an essentially complete retention of antioxidant activity and flavanol content was observed.

Reference: Stahl, L et al., *J. Food Science*, *74*(6), 456–461, 2009.



Reference: Stahl, L et al., *J. Food Science*, *74*(6), 456–461, 2009.

Quick Facts

- Basic leavening agents can have an impact on the final pH which also impacts naturally occurring and healthy flavanols found in products.
- The effect of increased pH due to baking soda can be largely reversed by choosing the appropriate leavening acid in the form of baking powder or adding acidic ingredients to the recipe.
- The final pH of the baked cake needs to be pH 7.5 or less for preservation of antioxidant activity and flavanol content.

Beyond the loss of flavanols from cocoa-flavored foods, other flavanol-rich ingredients such as grapes, raisins, cranberries, blueberries, apples, and other fruits, and spices, such as cinnamon may suffer significant loss in their flavanol content in cakes and baked goods with high final pH."

-Jeffrey Hurst, lead researcher