HERSHEY CENTER FOR HEALTH & NUTRITION®

Impact of Dutching on Antioxidants & Cocoa Flavanols

Research article characterizes the impact of alkalization on the antioxidant and flavanol content of cocoa powder

Scientists at the Hershey Center for Health & Nutrition® and Brunswick Labs have published the first comprehensive study on the impact of alkalization, also known as Dutch processing, on the flavanol antioxidant content of commercially available cocoa powders.

Until now, the common belief has been that antioxidants are completely destroyed by Dutching. In the present study the scientists found that certain Dutch processed cocoa powders, especially lightly and medium Dutch processed cocoas, retained significant amounts of flavanol antioxidants.

Dutching, or alkalization, of cocoa is a 180-year-old process used to improve flavor, lower the bitterness and darken the color of cocoa powder. Dutched cocoas are commonly used in beverages, such as chocolate milk and hot cocoa mixes, in cakes and cookies and in a limited number of confections.

Consumers can determine if chocolate and cocoa products sold in the U.S. contain Dutched/alkalized cocoa powder by reading the ingredient list on the food label. Dutched cocoa will be listed as "cocoa [chocolate] processed with alkali". The degree of dutching, however, is not reflected on the food label.

In the report, five natural (non-alkalized) and fifteen alkalized cocoa powders were obtained from commercial sources and analyzed for color, pH and flavanol antioxidants.

The natural (non-alkalized) cocoa powders had the highest flavanol content with an average of 34.6 mg of flavanols/g of cocoa powder or 346 mg of flavanols per 2 tablespoon (10g) serving. Natural cocoa powder is one of the richest dietary sources of flavanol antioxidants according to the USDA Proanthocyanidin Database.

The degree of cocoa alkalization caused a progressive, but not a complete loss, of flavanol antioxidants, with average losses of 60% for lightly dutched, 75% for medium dutched, and 90% for heavily dutched cocoas (see figure below).

Because cocoa powder is one of the foods highest in flavanol antioxidants known, the light and medium dutched powders were still in the top 10% of flavanol containing foods according to the USDA food proanthocyanidin database.

The wide range of flavanol contents in commercial dutched cocoa powders illustrate the need for more accurate communication of flavanol antioxidant content of food products.

Reference: Miller KB et al., *J. Agric. Food Chem.*, 56 (18), 8527–8533, 2008.

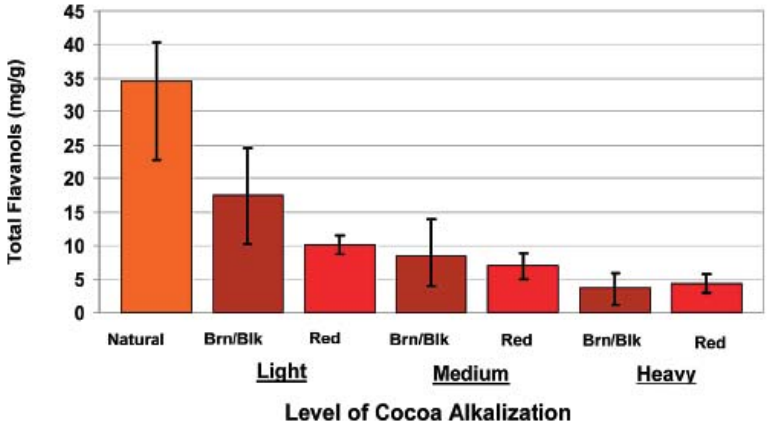

Figure 4. Total flavanols for brown/black and red Dutched cocoas. Cocoa powder samples were grouped into natural and lightly, medium, and heavily alkalized (Dutched) samples that were classified as either brown/black or red. The total flavanol contents, expressed in mg/g of sample, were averaged and are shown for natural cocoas (tan bars), brown/black cocoas (brown bars), and red cocoas (red bars). The brackets for each bar represent the range of values for each group of samples.

From: Miller KB et al., *J. Agric. Food Chem.*, 56 (18), 8527–8533, 2008.

Quick Facts

- Dutching, or alkalization, of cocoa is a 180 year-old process used to improve flavor, reduce the bitterness and darken the color of cocoa powder.
- Cocoa alkalization does cause a progressive, but not a complete, loss of antioxidants.
- The use of Dutched cocoa powder or chocolate in products can be determined from the ingredients statement as "cocoa [chocolate] processed with alkali".

"This is an important finding for people who like all things chocolate. Because cocoa powder is one of the richest sources of flavanol antioxidants to start with, even lightly or medium treated cocoa powders still retain significant levels of the beneficial antioxidants."

-Ken Miller, lead author