

Study clarifies the role of cocoa bean handling on flavanol levels

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As evidence regarding the health benefits of consuming dark chocolate and cocoa mounts, there has been an increasing debate about which cocoa and chocolate products deliver the most beneficial compounds, known as flavanols, and if steps in cocoa and chocolate production diminish the levels of cocoa flavanols.

In a recently published paper, scientists reported on the effect of conventional production methods of cocoa beans on the levels of flavanols, [natural antioxidants](#). The study, conducted by researchers at the Hershey Center for Health & Nutrition®, investigated cocoa beans and cocoa powders and described production steps that retain naturally occurring flavanols and reported that alkali processing causes a loss of up to 98% of one important flavanol, epicatechin, in the final product.

The study, published in the *Journal of Agricultural and Food Chemistry*, compared the effects of various common production methods on freshly harvested unfermented and naturally farm-fermented beans. Levels of epicatechin and catechin, a less active flavanol antioxidant, were compared in beans that were unfermented and in beans that underwent medium (about 5 days) and long fermentation (about 10 days). Long fermentation previously has been shown to impact the level of epicatechin in cocoa beans, and the authors reported loss of both flavanols as fermentation time increased. Beans were roasted to temperatures of 120°C and the researchers found that temperatures of 70°C or higher caused some loss (up to 88% at 120°C) of epicatechin. Catechin levels, however, increased as roasting temperature increased.

Additionally, natural cocoa powders and powders that had been treated with different levels of alkali also were measured. The study found that by far the greatest flavanol losses occurred during alkali processing. The results also suggested that epicatechin may be converted to catechin by alkali processing.

"This study is meant to address the impact of processing on the level of beneficial flavanol antioxidants found in cocoa beans" said Dr. Mark Payne, lead author of the paper. "We found that the processing step which causes the most loss in the flavanol epicatechin is the alkali processing step. Here the epicatechin, which is thought to be most beneficial, appears to be converted to catechin which has been shown to be less active in the body."

"Most of the world's cocoa beans undergo a natural, field fermentation on the farm and then roasting," said Dr. David A. Stuart, co-director of the Hershey Center. "Both steps are critical to the flavor development for [chocolate](#) and cocoa powder. It is important that we understand the balance in creating the wonderful flavor of chocolate with the [health benefits](#) of cocoa powder and dark chocolate. This study has gone a long way in furthering that understanding and is the first systematic study of the whole process, from bean to powder, that we are aware of."

Provided by The Hershey Company

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