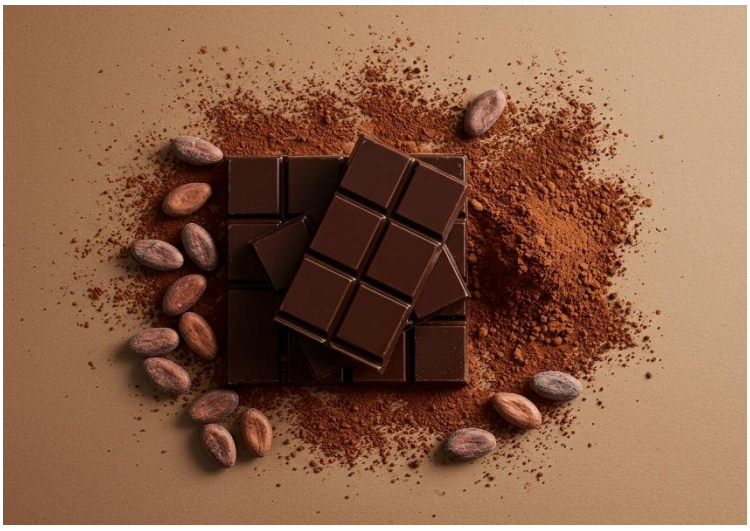
The Brain Benefits Come with a Catch but Cocoa Looks Promising for Mood

A recent study published reviewed evidence on the effects of cocoa polyphenols on brain health.

Neurological and depressive disorders are significant health concerns worldwide. The pathophysiology of both depressive and neurological disorders comprises interrelated mechanisms, including excitotoxicity, mitochondrial dysfunction, and reduced expression of neurotrophic factors (e.g., brain-derived neurotrophic factor [BDNF]). Diet and nutrition have increasingly been recognized as modifiable determinants of cerebral health.

Dietary bioactive compounds, especially polyphenols, have diverse effects on the central nervous system (CNS) by acting on anti-inflammatory, neuromodulatory, and antioxidant pathways. Cocoa contains high levels of polyphenols and is recognized as a potential neuroprotective candidate. Flavanols and procyanidins are abundant in cocoa, and some cocoa-derived compounds and metabolites may reach the brain and influence cerebral regions linked to cognitive function.

Cocoa flavanols can improve cerebral blood flow and endothelial function and modulate neuroinflammation. Moreover, the flavanol epicatechin has been shown to enhance learning and spatial memory in animal models. Nevertheless, the molecular mechanisms linking cocoa polyphenols to neuroprotection have yet to be elucidated. In the present study, researchers summarized current evidence on cocoa polyphenols in the context of brain health.



Study

Clinical studies have examined the effects of dark chocolate or cocoa polyphenols on mood, emotional well-being, and depression. A randomized controlled trial in 47 overweight or obese middle-aged adults found that depressive symptoms decreased in both the cocoa and control groups after four weeks; cocoa supplementation also increased plasma homovanillic acid, which was associated with changes in depressive symptoms. Separately, another trial found modest but statistically non-significant reductions in neuropathy scores after 12-week cocoa supplementation among people with type 2 diabetes.

Further, dark chocolate intake for eight weeks was found to reduce depression among menopausal women relative to milk chocolate intake. Another study showed that consuming

cocoa polyphenol beverages improved contentment and calmness after 30 days, although no significant acute effects on cognition or mood were observed. An eight-week crossover study reported that high cocoa liquor improved mood, fatigue, and residual function in individuals with chronic fatigue syndrome.

A study reported improvements in negative affect in healthy individuals with 30 g/day of 85% cocoa dark chocolate for three weeks, but not with 70% cocoa chocolate. 16S ribosomal RNA (rRNA) sequencing of fecal samples revealed an increase in gut microbial diversity and Blautia obeum levels and a reduction in Faecalibacterium prausnitzii levels. Notably, changes in negative affect negatively correlated with the relative abundance of B. obeum and microbial diversity. However, these associations did not establish that the microbiome changes caused the improvement in negative affect.

Findings

Cocoa interventions have generally been reported to modulate cognitive performance and synaptic plasticity in animal models. A combination of polyunsaturated fatty acids, probiotics, and chocolate improved memory and spatial learning in Wistar rats, although the study could not isolate the contribution of chocolate. In a rat model of Alzheimer's disease (AD), cacao administration enhanced recognition and spatial memory and decreased neuronal degeneration in the hippocampus.

Human studies have yielded more heterogeneous results. For instance, an acute dose of cocoa flavanols with or without caffeine had no effect on working memory or attention in young adults. In contrast, slight improvements in processing speed and cognitive flexibility were reported in postmenopausal women consuming 99% cocoa chocolate for six months, although other cognitive measures did not improve. However, one trial did not find improvements in reaction time and cognitive accuracy with cocoa flavanols.

Dark chocolate consumption was reported to improve verbal episodic memory in healthy young adults. Likewise, another study reported improvements in cognitive performance and increases in plasma nerve growth factor with dark chocolate. Consuming beverages high in cocoa flavanols before exercise enhanced exercise-induced improvements in executive function but did not improve memory. A four-week study found that dark chocolate intake reduced fatigue and may have indirectly enhanced cognitive performance.

Conclusion

Taken together, cocoa polyphenols have diverse neurocognitive health effects. The review identified the strongest evidence for effects on depression and mood, although human clinical studies remain limited and heterogeneous, and preliminary findings highlight that cocoa-induced gut microbiota changes may play a role in improving negative affect. However, their effects on cognitive domains (e.g., learning and memory) are heterogeneous. Preclinical studies report consistent improvements in hippocampal neurogenesis, spatial memory, and plasticity.

However, large randomized clinical trials have generally found negligible or no substantial improvements in overall cognition. Moreover, while preclinical studies indicate the involvement of multiple pathways underlying the reported effects, these mechanisms have not been adequately investigated in human populations. Future research should adopt more integrative, translational, and precise methodologies alongside larger, standardized, and longer-term clinical trials to better elucidate the potential therapeutic effects of cocoa polyphenols.

Source:

https://www.news-medical.net/news/20260817/Cocoa-looks-promising-for-mood-but-the-brain-benefits-come-with-a-catch.aspx