



# Food of the Gods: Deconstructing a Psychoactive Enigma

An investigation into the secret life of *Theobroma cacao*.

The cacao tree was named *Theobroma cacao* by the 17th-century naturalist Linnaeus. The Greek term literally means “food of the gods.” This presentation explores the science behind that name.



# The question is not *if* chocolate affects us, but *how*.



Over 300 different constituent compounds have been identified in chocolate, delivering far more than a simple sugar high. Yet its cocktail of psychochemical effects in the central nervous system remains poorly understood.

Let's investigate the evidence, from ancient lore to modern neuroscience.



# The investigation begins in the Aztec Empire, where chocolate was currency, sacrament, and a drink for the elite.



- **Reserved for the powerful:** The hot, frothy beverage was consumed by warriors, nobility, and priests for its stimulant and restorative properties.
- **A source of power:** It was reputed to confer wisdom and vitality. Emperor Montezuma allegedly drank 50 goblets a day.
- **Sacred and valuable:** Used in religious ceremonies associated with Xochiquetzal, the goddess of fertility.
- **A form of currency:** Aztec taxation was levied in cacao beans. 100 beans could buy a slave; 12 bought the services of a courtesan.



**The lore continued in Europe, where chocolate gained a reputation as a potent aphrodisiac.**



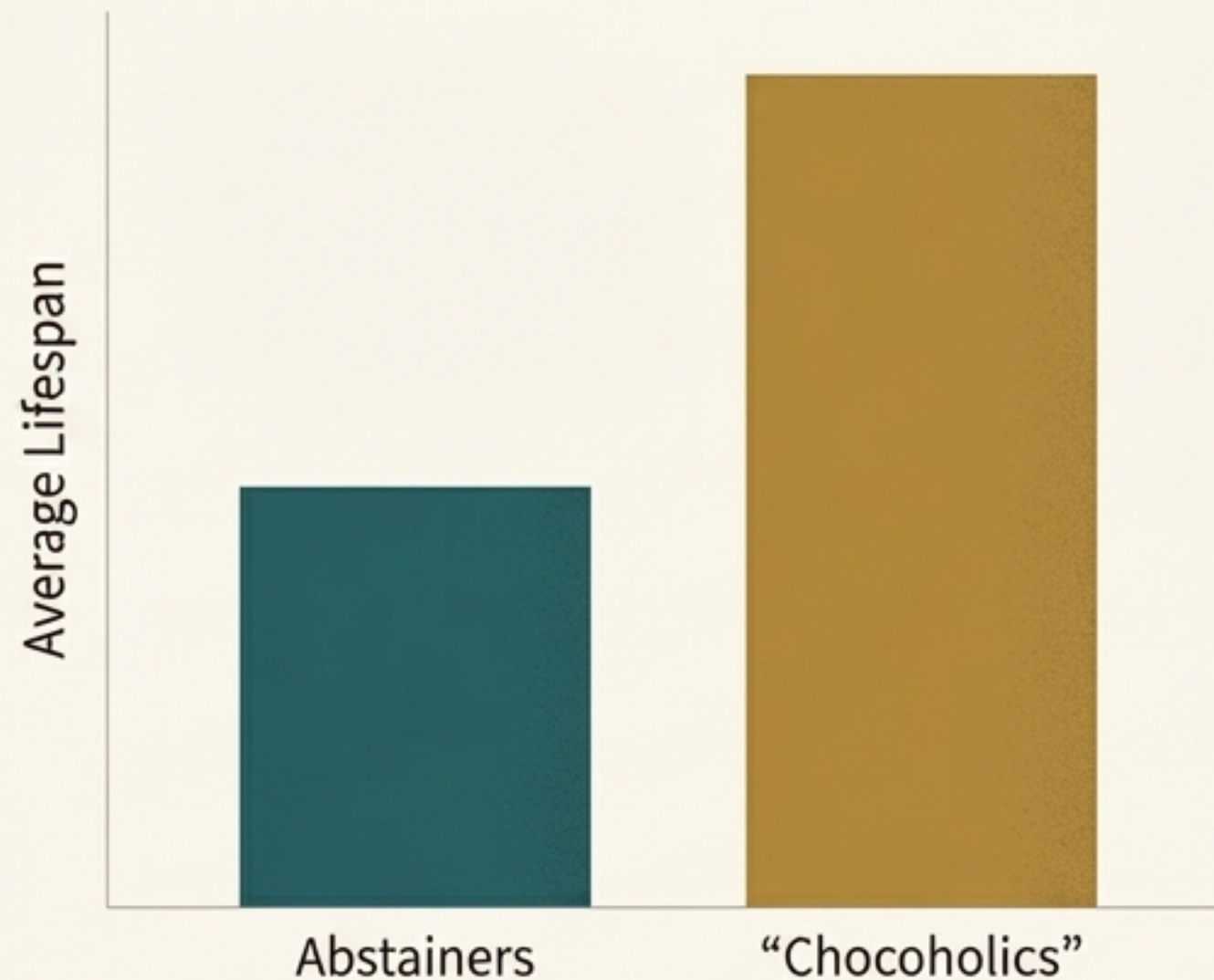
**“The celebrated Italian libertine Giacomo Casanova (1725–1798) famously consumed chocolate before his romantic conquests, relying on its reputation to enhance his encounters.”**

This historical use as a ‘subtle aphrodisiac’ demonstrates that the belief in chocolate’s psychoactive properties was not lost in its journey across the Atlantic.



# Modern studies suggest the legends of vitality may have a basis in fact.

The Harvard Graduates Study



- **“The Harvard Graduates Study”**

A study of 8,000 male graduates showed that “chocoholics” lived longer than abstainers.

- **“The Supercentenarian Link”**

Many of the world's oldest people, including Jeanne Calment (122?) and Sarah Knauss (119), were passionately fond of chocolate. Calment ate two pounds per week until age 119.

- **“The Scientific Theory”**

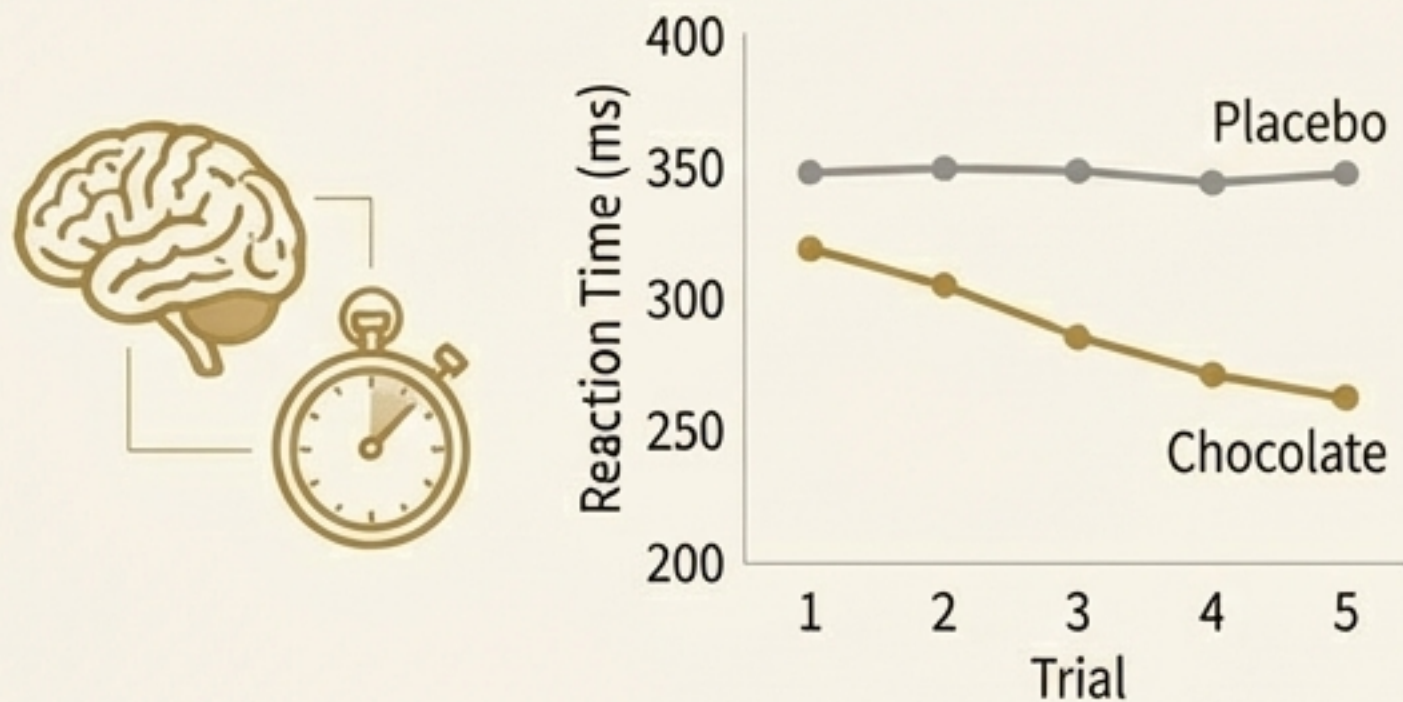
Longevity may be explained by high polyphenol levels, which reduce the oxidation of low-density lipoproteins and protect against heart disease.

*The source notes this theory is “still speculative”.*



# Evidence points to tangible enhancements in cognitive performance.

## Study 1: Human Performance (Dr. Bryan Raudenbush, 2006)



Placebo-controlled trials suggest subtle cognitive enhancement.

**Specific Improvements:** Higher scores for verbal and visual memory, improved impulse-control and reaction-time.

**Caveat:** "This study needs replicating."

## Study 2: Brain Activity (AAAS Symposium, 2007)



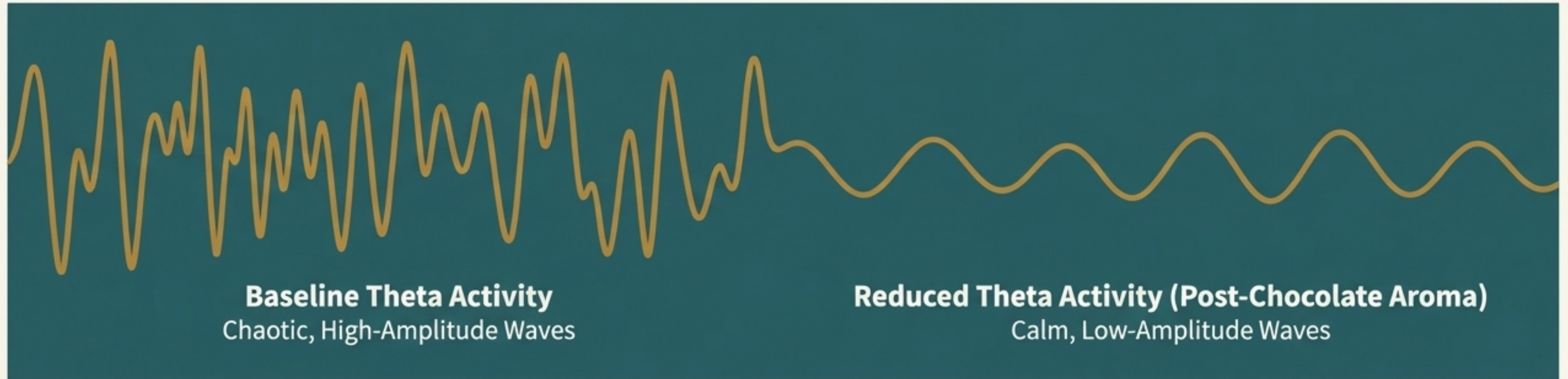
Experiments with chocolate-fed mice show flavanol-rich cocoa stimulates neurovascular activity.

**Observed Effects:** Enhanced memory and alertness.

**Caveat:** "This research was partly funded by Mars, Inc."



# The data suggests chocolate's impact is profoundly rewarding and uniquely calming.



## More Rewarding Than a Kiss?

A 2007 UK study suggested that the brain and body response to eating dark chocolate was more intense and longer-lasting than that from a passionate kiss.

*(Note: 'More research is needed to replicate this result.')*

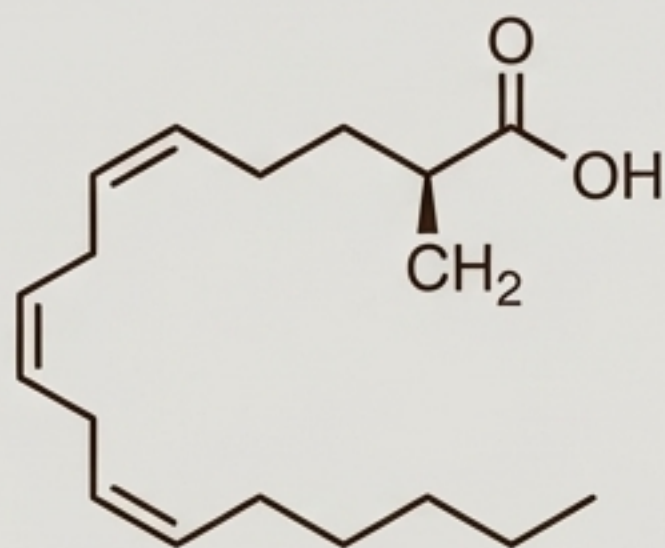
## The Relaxing Aroma

A separate UK study of human EEG response found the odor of chocolate significantly reduces theta activity in the brain, an effect associated with enhanced relaxation.

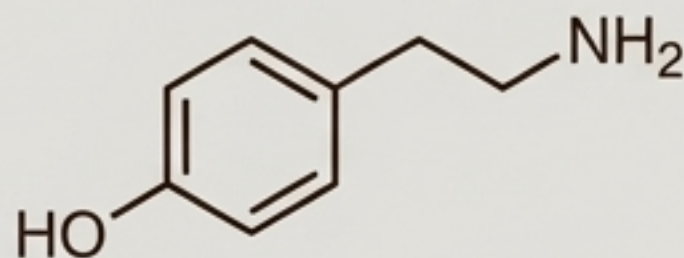
*(Note: 'This study needs replication.')*



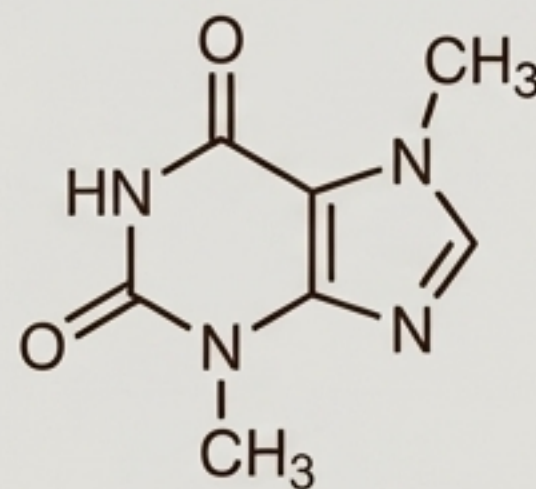
## The investigation now turns to the chemical culprits: a psychoactive cocktail of over 300 compounds.



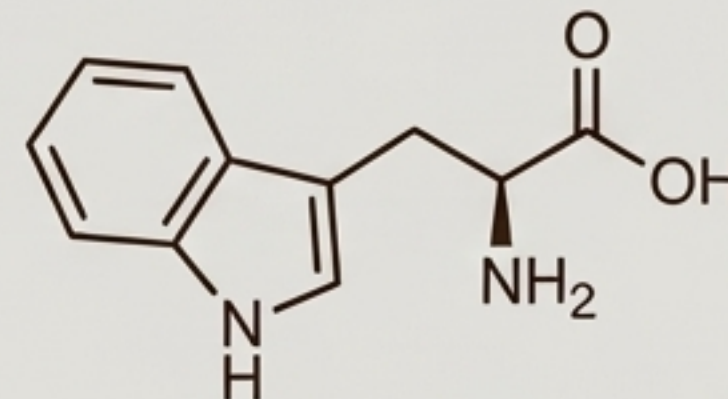
Anandamide



PEA



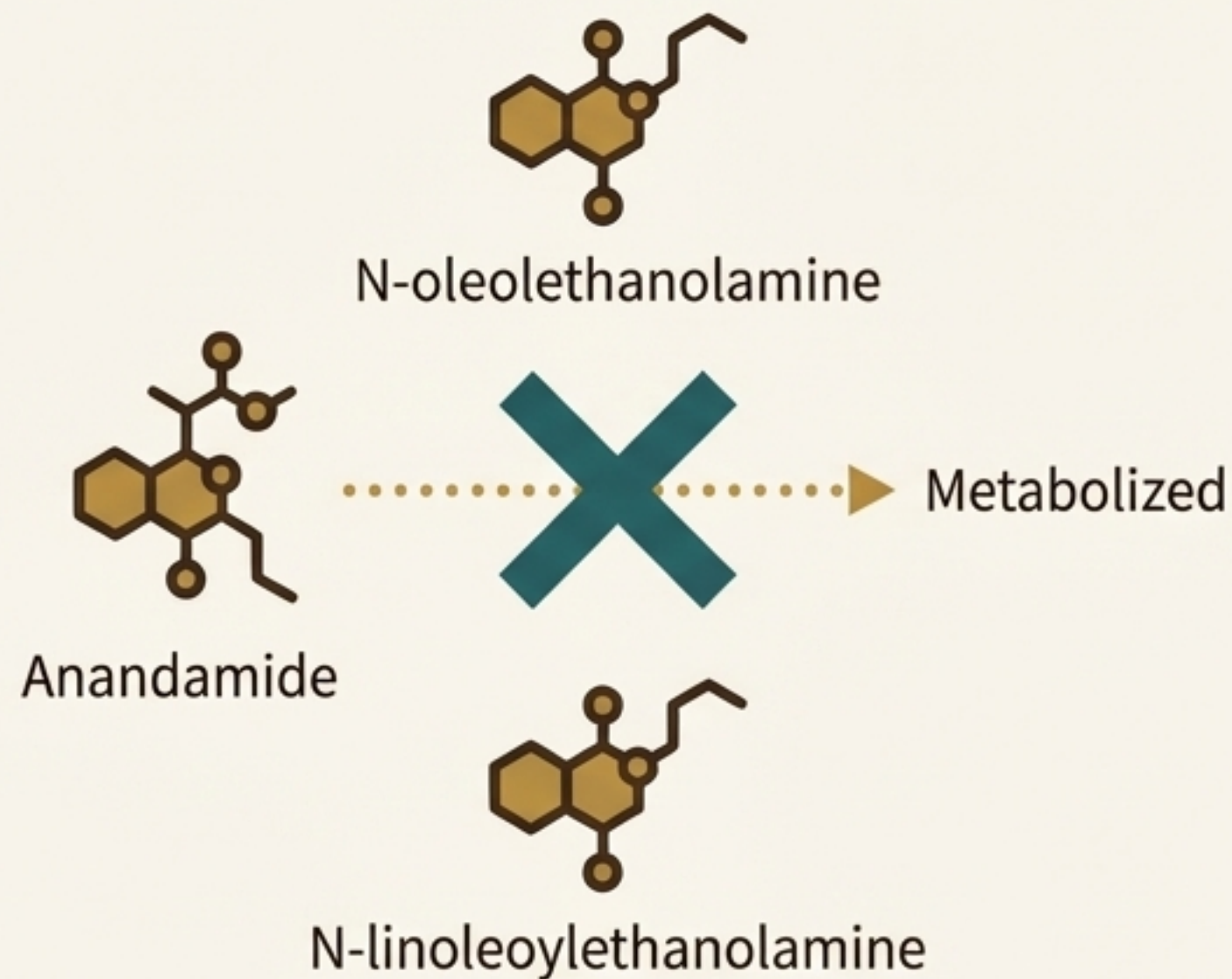
Theobromine



Tryptophan

Chocolate is not a single-ingredient story. Its effects arise from a complex, synergistic interaction of many neuroactive chemicals. We will now examine the prime suspects responsible for its profound impact on the human brain.





## Inhibition of Anandamide Breakdown

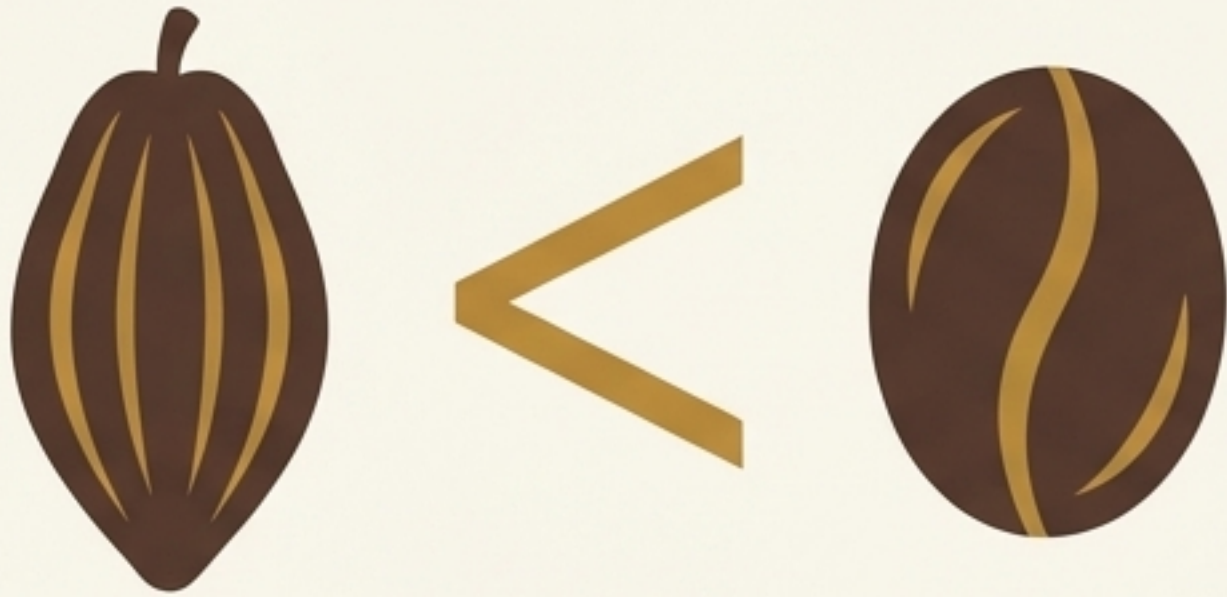
### Suspect #1: Anandamide, the "bliss molecule," and its chemical accomplices

- **The Compound:** Chocolate contains small quantities of anandamide, an endogenous cannabinoid found in the brain.
- **The Nuance:** Skeptics note one would need to consume pounds of chocolate for a noticeable effect from anandamide alone.
- **The Key Insight:** However, chocolate also contains two structural cousins of anandamide that inhibit its metabolism. It is speculated that they prolong the feeling of well-being induced by anandamide.



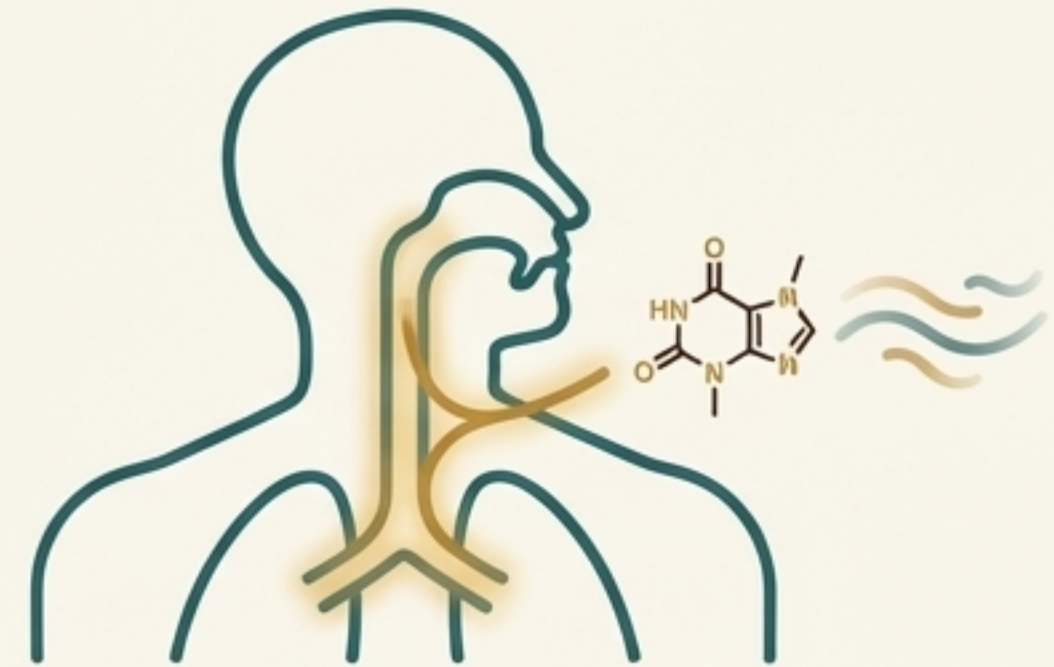
# Suspects #2 & #3: The familiar stimulants, Caffeine and Theobromine, play a supporting role.

## Caffeine



Present only in modest quantities. An entire ounce of milk chocolate contains no more caffeine than a typical cup of 'decaffeinated' coffee.

## Theobromine

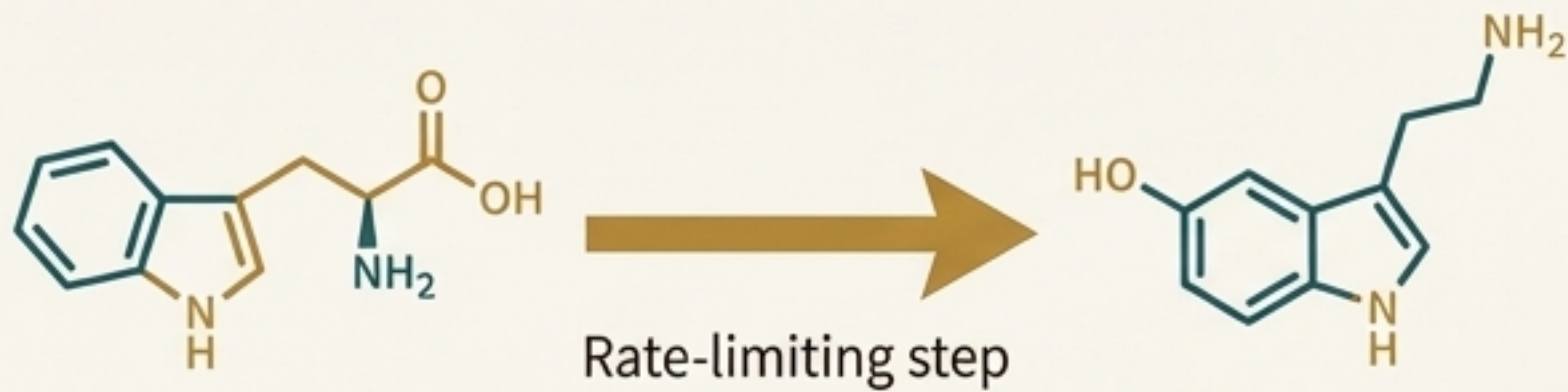


Contributes to the psychoactive profile but is unlikely to be the primary determinant.

**An Unexpected Benefit:** Recent research suggests pure theobromine may be superior to opiates as a cough medicine due to its action on the vagus nerve.



## Two more suspects enter the lineup, targeting mood — and pleasure pathways



### Tryptophan

An essential amino acid and a rate-limiting step in producing the mood-modulating neurotransmitter serotonin.

**Caveat:** A significant increase in brain intake normally requires an unusual low-protein, high-carbohydrate meal.



### Endorphins

Like other palatable sweet foods, chocolate triggers the release of the body's endogenous opiates.

**Effect:** This reduces sensitivity to pain and likely contributes to the "warm inner glow" susceptible chocoholics experience.



# Prime Suspect: Phenylethylamine (PEA), the controversial “love chemical.”



## The Case for PEA

- PEA releases **dopamine** in the brain's pleasure centers and peaks during orgasm.
- **Dopamine** in **Cacao Gold**.
- It helps mediate feelings of **attraction, excitement, giddiness, and euphoria**.

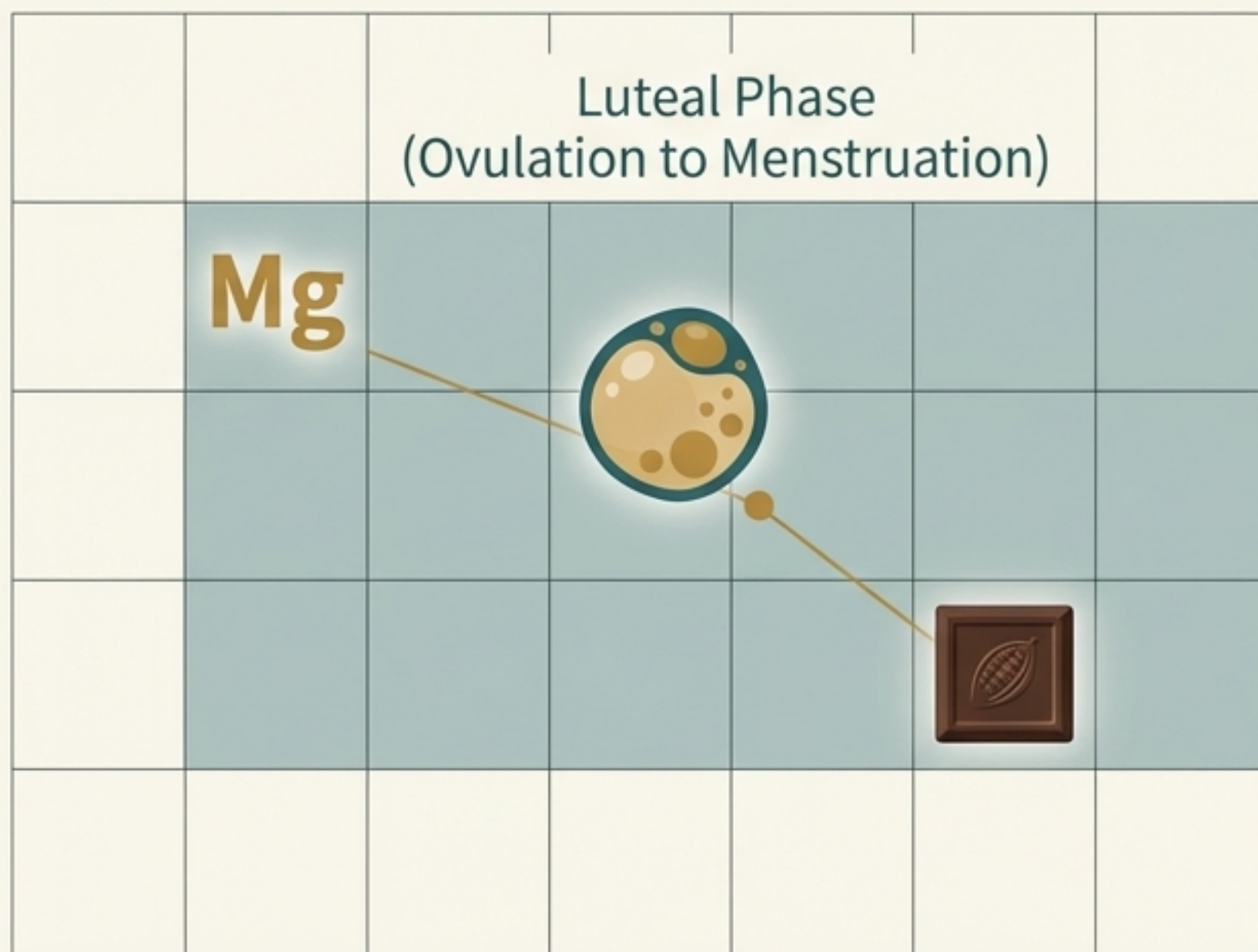
## The Case Against

- The role of the “chocolate amphetamine” is disputed, as most chocolate-derived PEA is metabolized before it reaches the central nervous system.

## The Complication

- PEA has also been described as an “endogenous anxiogen,” and one of its metabolites is unusually high in subjects with paranoid schizophrenia.



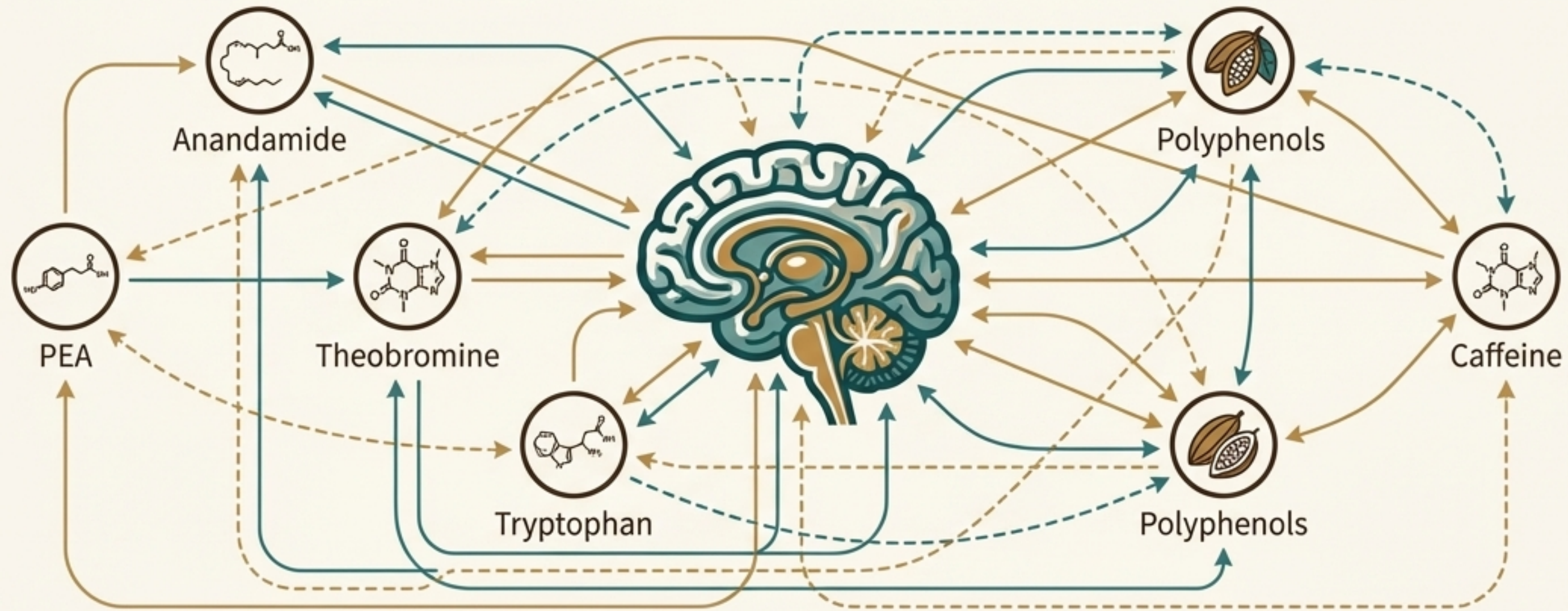


## The evidence also provides clues to the specific nature of chocolate cravings.

- **Magnesium:** Acute monthly cravings in pre-menstrual women may be partly explained by chocolate's rich magnesium content, as magnesium deficiency exacerbates PMT.
- **Hormones:** Before menstruation, high levels of the hormone progesterone promote fat storage and may cause a craving for fatty foods. One study found 91% of cycle-associated cravings occurred between ovulation and menstruation.
- **Addiction?:** Cacao contains tetrahydro-beta-carbolines (also found in alcohol), but their possible role in chocolate addiction remains unclear.



# The Verdict: There is no single culprit, but a complex, synergistic conspiracy.



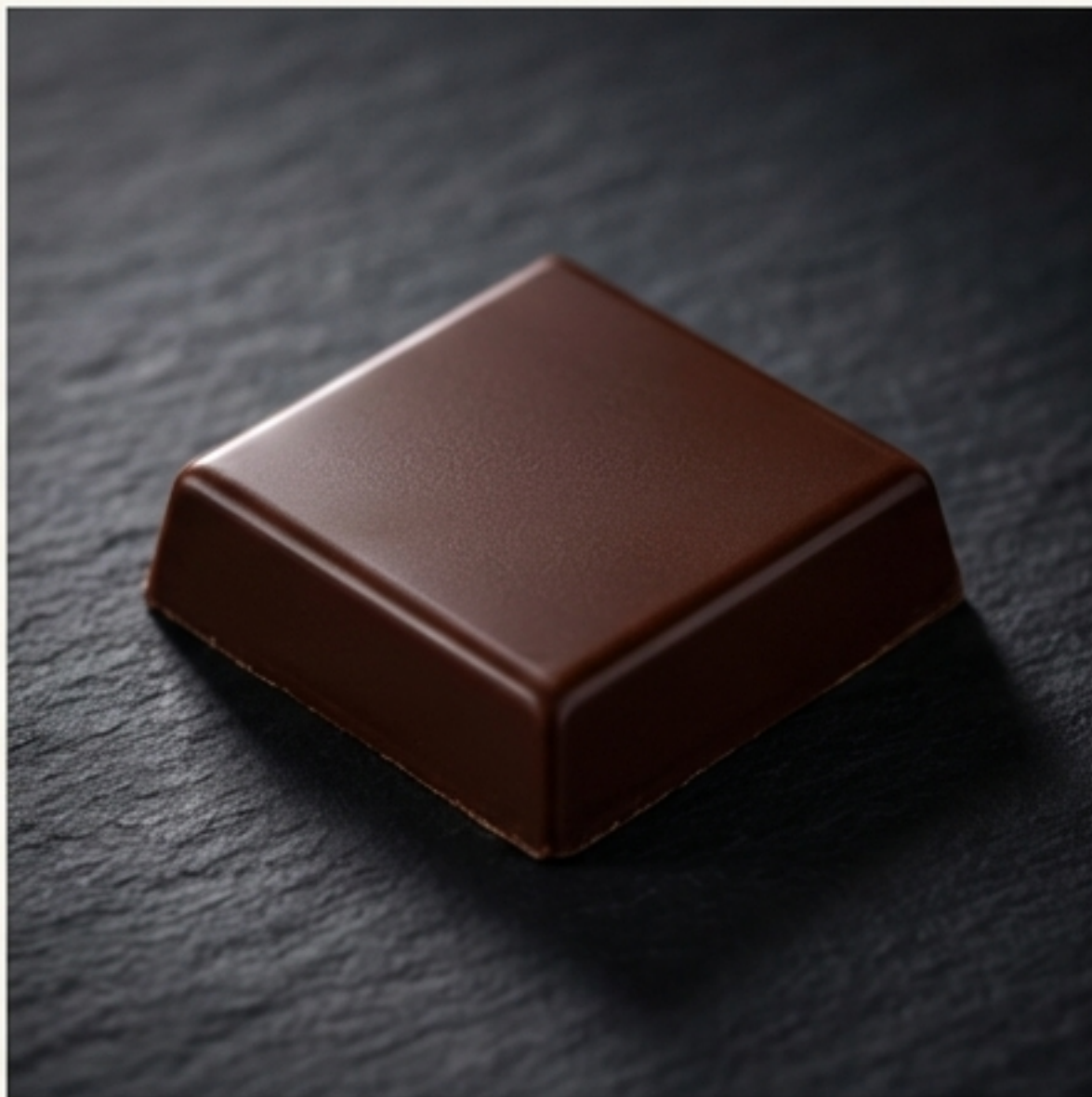
## Summary

The psychoactive effect of chocolate does not come from one “magic bullet” compound. It arises from a poorly understood interaction between a multitude of active ingredients.

## The Remaining Mystery

While there is tentative evidence that active polyphenols are implicated in chocolate’s mood-elevating effects in humans, the exact mechanism remains elusive. The investigation continues.





So the next time you taste chocolate, remember: you are not just eating a sweet. You are experiencing one of chemistry's most delicious and enduring enigmas.

The name *Theobroma cacao* is more than a historical curiosity. It is a fitting tribute to a profound biochemical reality that science is still working to fully understand.