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Specific Fruit Choices Raise Flavanol Intake — and Most Diets Fall Short

Analysis by Dr. Joseph Mercola | September 12, 2026

STORY AT-A-GLANCE

- Previous research, including the large COSMOS clinical trial, found that consuming about 500 milligrams (mg) of flavanols daily was associated with a lower risk of dying from cardiovascular disease and fewer major cardiovascular events. However, note that COSMOS tested a cocoa extract supplement rather than food, enrolled adults aged 60 and older, and the reduction in major cardiovascular events came from a post hoc analysis
- The featured study found following current fruit and vegetable recommendations didn't provide enough flavanols for most people to reach the intake linked with better heart health, showing that which foods you choose affects flavanol intake more than how many servings you eat. Even then, high-flavanol produce did not reliably reach the 500 mg benchmark in the researchers' simulations
- Researchers analyzed more than 30,000 people from the U.S. and United Kingdom using objective laboratory measurements instead of relying only on food questionnaires, giving a more accurate picture of real-world flavanol intake
- Apples, blueberries, blackberries, cherries, pears, plums, green tea, and minimally processed cocoa are among the foods that naturally provide higher amounts of flavanols, making them smart additions to a heart-healthy eating pattern
- Instead of simply eating more produce, rotating a wider variety of flavanol-rich fruits and other plant foods into your meals is an easy way to increase these beneficial compounds while enjoying the many other nutrients whole foods provide

For centuries, people have relied on fruits, tea, and cocoa not only for nourishment but also for their health-promoting compounds. Today, researchers have identified one group of those natural compounds — flavanols — as especially important for cardiovascular health. Flavanols are plant compounds found in foods such as apples, berries, pears, beans, tea, and cocoa.

Yet new research published in Food & Function suggests that simply following current dietary guidelines leaves most people well short of the flavanol intake linked with measurable heart benefits.[1] That finding deserves your attention because many people assume eating the recommended number of fruit and vegetable servings automatically delivers every beneficial plant compound.

According to this research, that assumption doesn't hold up well. The gap isn't mainly about eating more produce — which produce you choose matters more, though as the researchers found, food choice alone doesn't fully close it either. This is an important distinction because it shifts the conversation away from quantity and toward quality. Once you understand why certain fruits contribute far more of these compounds than others, the results of the study become much easier to act on.

One caveat worth knowing upfront before going into the findings — much of the flavanol evidence base, including the COSMOS trial discussed below, is industry-funded. Two authors of this new paper are employed by Mars, Incorporated — a company engaged in flavanol research and flavanol-related commercial activities — and COSMOS was supported by an investigator-initiated grant from Mars Edge, with study pills donated by Pfizer Consumer Healthcare (now Haleon).[2]

Healthy Eating Alone Doesn't Always Deliver Enough Flavanols

Previous research, including the largest clinical trial of flavanols, the COSMOS study, reported that a daily 500 milligram (mg) dose of **flavanols** — delivered as a cocoa extract supplement to 21,442 U.S. adults (women aged 65 and older, men aged 60 and older) over a median of 3.6 years — was associated with a 27% lower rate of cardiovascular death in intention-to-treat analyses.

Reductions in total cardiovascular events (15%) and major cardiovascular events (16%) came from per-protocol and post hoc analyses, respectively.[3] That 500 mg benchmark became the foundation for a follow-up question researchers set out to answer in Food & Function: Do the diets most people actually eat get them anywhere close to that target?[4]

To answer that question, the researchers analyzed flavanol intake in two large population studies instead of relying on assumptions about what people eat. Both analyses were observational: the COSMOS portion was a cross-sectional analysis of data collected before participants received any supplement, and EPIC-Norfolk is an observational cohort. Neither measured health outcomes — they assessed flavanol intake only.

They used objective laboratory measurements from 6,509 participants in the U.S.-based COSMOS study and 24,154 participants in the U.K.-based EPIC-Norfolk study to determine whether real-world eating habits matched the flavanol intake associated with better heart health. The answer was largely no.

- **Eating more produce was only part of the story —** In COSMOS, eating more fruits and vegetables came with slightly higher flavanol levels, though the difference was too small to be meaningful. Overall diet quality was the better predictor.

  In EPIC-Norfolk, the pattern reversed. Participants with the highest fruit and vegetable intake — and those adhering most closely to U.K. dietary guidance — were slightly less likely to reach 500 mg per day. The researchers described the differences between high and low fruit and vegetable consumers as very modest overall. Either way, most participants failed to reach the estimated 500 mg per day benchmark.

  The researchers also note that they deliberately set their biomarker thresholds to overestimate how many people had high intakes, making their figures a best-case scenario, and that COSMOS participants ate considerably better than the general U.S. public — so, the true shortfall is likely larger.*

This matters because it changes how you think about food choices. If your goal is to increase flavanol intake, simply counting servings of fruits and vegetables isn't enough. Different foods contain dramatically different amounts of flavanols. Choosing foods naturally richer in these compounds has a much larger impact than simply increasing the total number of servings. Think of it like filling a toolbox — adding more tools helps, but adding the right tools makes the biggest difference.

- **The researchers tested whether common eating habits could realistically reach the target —** To answer that question, they performed thousands of computer simulations using foods commonly eaten in the U.S. Those simulations reinforced the findings from the human studies. Average fruit and vegetable choices rarely produced flavanol intakes near 500 mg per day.

  Selecting foods based on their naturally higher flavanol content raised estimated intake — but even then, the probability of reaching 500 mg per day remained below 50%, and the researchers concluded that even five portions of high-flavanol fruits and vegetables did not get simulated diets to the 500 mg mark. That means the quality of your ingredients matters as much as quantity when selecting plant foods — and that closing the gap through ordinary food choices alone is harder than it sounds.

- **Objective testing strengthened the findings —** Many nutrition studies depend heavily on people remembering exactly what they ate, but memory is imperfect. This investigation added another layer of confidence by measuring flavanol metabolites in urine. Metabolites are the byproducts left in your bloodstream and urine after your body processes what you've eaten, measurable chemical fingerprints of your recent diet.

  The investigators combined two different biomarkers to reflect different time windows after eating flavanol-rich foods. Because flavanols clear the body quickly, researchers needed two markers with different detection windows to capture intake

across an entire day, not just a single meal. The two markers have different estimated systemic half-lives — roughly two hours for one and six hours for the other.

Together, they provided a broader snapshot of daily flavanol intake. Using both measurements also reduced the chance that a single meal would distort the results. One limitation the researchers flagged: there are currently no validated biomarkers for tea-specific flavanols, so tea's contribution is only partly captured.

- **The same shortfall appeared across two different countries —** Although people in the U.S. and United Kingdom eat differently, a similarly small share of each population reached the flavanol benchmark. The direction of the diet-quality association, however, differed between the two cohorts, as noted above.

  Participants in the United Kingdom consumed much more tea than those in the U.S., yet only 17.9% of EPIC-Norfolk participants reached the estimated flavanol target compared with 19.2% of COSMOS participants.

  The researchers also observed several interesting differences between participant groups. Men were more likely than women to reach the estimated flavanol intake in both studies. In COSMOS, normal-weight participants were more likely than participants with obesity to meet the target, while the opposite pattern appeared in EPIC-Norfolk.

  Those differences suggest that overall eating patterns, cultural food choices, and lifestyle habits all influence flavanol intake rather than any single factor alone.

- **Not every fruit or vegetable contributes equally —** One of the most practical lessons from the study is that flavanols are unevenly distributed across foods. The researchers identified apples, berries, stone fruits, beans, tea, and cocoa products as important dietary sources, while many other commonly eaten fruits and vegetables contribute much less.[5]

That creates an opportunity rather than a challenge. Instead of simply aiming for more produce every day, focus on building meals around foods naturally richer in flavanols. Small upgrades repeated consistently move you closer to the intake levels associated with better cardiovascular health in this research. That approach keeps the goal simple, measurable, and easier to maintain over the long term.

**These findings are from research conducted in clinical settings. Results may not apply to all individuals.*

Choose Foods That Naturally Deliver More Flavanols

The research points to a practical conclusion: The foods you rotate through your week matter more than hitting a produce quota. Think beyond counting fruit and vegetable servings and instead focus on foods that naturally supply higher amounts of flavanols. That approach addresses the real issue identified in the research — many healthy diets still fall short because the food choices themselves are too low in these beneficial plant compounds.

1. **Choose fruits and vegetables naturally rich in flavanols —** If you want to support your heart, make foods like apples (with the peel), blueberries, blackberries, cherries, and plums regular parts of your meals rather than defaulting to lower-flavanol options like bananas or melons. Bananas and melons still provide valuable nutrients and deserve a place in a healthy diet, but when flavanol intake is the goal, every serving works harder when it comes from the right source.

   Pairing these foods with green tea is an easy addition, though keep the ceiling in mind. In the U.K. cohort, even the heaviest tea drinkers reached the 500 mg benchmark only about 19% of the time. When possible, choose organic produce to reduce your exposure to agricultural chemicals, and if you have the space, consider growing some of your own fruit. Homegrown berries, cherries, and plums give you fresh, flavorful options while letting you control how they're grown.

To put the 500 mg daily target in perspective, here are approximate figures reported for select flavanol-rich foods. These come from the News Medical summary of the research rather than from the featured study itself, and the serving sizes are estimates:

- Plums (about 4 medium plums): ~450 mg
- Cranberries (1½ cups): ~300 mg
- Blackberries (1½ cups): ~250 mg
- Green tea (one 8 oz. cup): ~200 mg
- Cherries (about 25 to 30 pieces): ~130 mg
- Apple with skin (one medium apple): ~110 mg
- Strawberries (1½ cups): ~90 mg
- Blueberries (1 cup): ~80 mg

Again, treat these as estimates, not fixed values. The researchers caution that flavanol content varies considerably with cultivar, climate, and growing and harvest conditions. For example, the epicatechin content of a single apple variety can fluctuate more than tenfold, meaning the number of apples needed to reach a given intake could range from 2 to 29.

Green tea's figure also deserves a mention — the study's biomarkers do not capture tea-specific flavanols, so how much tea contributes to the intake linked with cardiovascular benefit is not yet established.[6]

One practical caveat if your gut isn't in good shape — Large servings of berries and beans add a substantial fiber load, and when the gut microbiome is compromised, fiber can increase endotoxin production. If you notice gas, bloating, stomach pain,

diarrhea, or constipation, start with whole fruits and white rice to restore gut function, then work up to larger portions of higher-fiber foods as tolerance improves.

2. **Make flavanol-rich foods part of your daily routine —** Your body responds to consistent habits, not occasional healthy meals. If you enjoy blueberries with breakfast, an apple as a snack, or a cup of green tea in the afternoon, keep those habits going day after day. Small routines are much easier to maintain than dramatic diet changes.

3. **Challenge yourself to add more variety each week —** If your shopping cart looks the same every trip, add one flavanol-rich food you don't normally buy. Try pears, cranberries, red raspberries, black currants, or minimally processed cocoa. Note that black tea's characteristic flavanols (theaflavins and thearubigins) were not captured by the featured study's biomarkers, and their contribution to cardiovascular benefit remains to be established.

   With cocoa, choose varieties with lower percentages, look for Prop 65 certification and transparent heavy-metal testing, and avoid products containing vegetable oils. A scrutinizing eye keeps meals interesting while expanding the variety of beneficial plant compounds in your diet.

4. **Stock your kitchen with intention —** Healthy choices become much easier when the right foods are already within reach. Before your next shopping trip, write down three or four flavanol-rich foods you'll commit to buying that week and treat them as non-negotiables alongside your usual staples.

   Small, consistent food choices — an apple instead of a banana, a cup of green tea, a handful of blueberries on the side — are an easy way to raise your flavanol intake. Whether food-based flavanols translate into lower cardiovascular risk has not been tested directly; the risk data available comes from a supplement trial. However, the research does give you a clearer map of where flavanols are concentrated. The next step is simply stocking your kitchen accordingly.

5. **Beyond flavanols, build your meals around whole foods —** Flavanols are only one part of a heart-healthy diet. Fill your plate with a variety of whole fruits, vegetables, and other minimally processed foods that provide vitamins, minerals, and thousands of other beneficial plant compounds that work together to support a healthy heart.

   At the same time, avoid ultraprocessed foods, which are often made with inflammatory **seed oils** such as soybean, corn, sunflower, safflower, and canola oil. Prepare meals with more stable fats like grass fed butter, ghee, or beef tallow instead. Cutting back on ultraprocessed foods while adding more whole, flavanol-rich foods doesn't just boost your flavanol intake, it upgrades the entire foundation your heart health is built on.

FAQs About Fruit Choices That Boost Flavanol Intake

Q: What are flavanols, and why are they important for your heart?

A: Flavanols are natural plant compounds found in foods such as apples, blueberries, blackberries, cherries, pears, plums, beans, tea, and cocoa. Previous research, including the COSMOS trial, linked a daily intake of about 500 mg of flavanols with a lower risk of dying from cardiovascular disease and fewer major cardiovascular events.[7] COSMOS delivered those flavanols as a cocoa extract supplement to adults aged 60 and older; the major cardiovascular events finding came from a post hoc analysis.

Q: Does eating the recommended amount of fruits and vegetables provide enough flavanols?

A: Not for most people. The Food & Function study found that fewer than 1 in 4 people who followed current dietary recommendations reached the flavanol intake associated with heart-health benefits. The researchers concluded that adherence to

current dietary guidelines does not ensure flavanol intake at the level linked with cardiovascular benefit, and that specific dietary reference values for flavanols may still be necessary.

Q: Which foods are among the best natural sources of flavanols?

A: Foods naturally rich in flavanols include apples, blueberries, blackberries, cherries, pears, plums, green tea, black tea, and minimally processed cocoa. Eating a variety of these foods throughout the week is an easy way to increase your flavanol intake while also providing other beneficial nutrients.

Q: Should you stop eating fruits that contain fewer flavanols?

A: No. Fruits such as bananas, melons, and many others still provide vitamins, minerals, fiber, and other beneficial plant compounds. If your goal is to increase flavanol intake, simply include higher-flavanol fruits more often instead of replacing all other fruits.

Q: What is the easiest way to increase your flavanol intake?

A: Focus on food choices instead of simply eating more produce. Stock your kitchen with flavanol-rich fruits, enjoy green tea regularly (black tea also contains flavanols, though not the types this study could measure), rotate different berries and other high-flavanol fruits throughout the week, choose organic produce when practical, and consider growing some of your own fruit if you have the space.

This article is for informational purposes only and does not constitute medical advice. Consult a qualified health care provider before making changes to your health regimen.

Sources and References

- [1, 2, 4, 6] Food & Function, Issue 12, 2026
- [3, 7] COcoa Supplement and Multivitamin Outcomes Study (COSMOS)
- [5] News Medical June 8, 2026