

PART 3

Acidity and the body: is coffee really a gut irritant?



Sorting science from myth in the debate on acids and digestion

"I love coffee, but it upsets my stomach. Must be the acid".

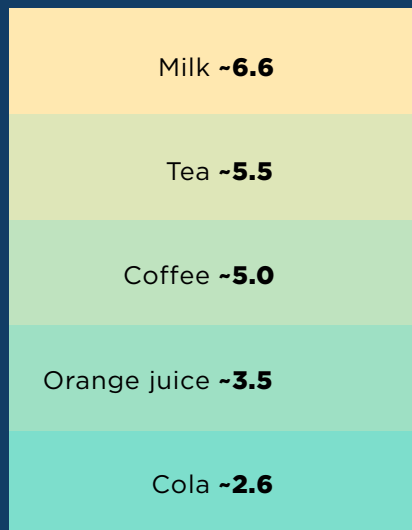
It's a phrase we've all heard - maybe even said. But what does science tell us about the relationship between coffee acidity and digestive health?

The truth is more complex than popular wisdom suggests.

Let's take a look.

Comparative pH of common beverages

LESS ACIDIC



↓
MORE ACIDIC

CHLOROGENIC ACIDS:
affect gastric motility

CAFFEINE:
gastric acid
secretion



Factors proposed
to influence
gastrointestinal
response to coffee

**ROASTING
BYPRODUCTS:**
sensitive mucosa
irritation

Is it really the acid?

As we have seen, coffee is mildly acidic, with a pH between **4.8 and 5.2**, depending on roast and brewing.

For comparison: orange juice is around 3.5, cola around 2.5. Yet many people tolerate those beverages better than coffee. Why?

Acidity perception and gastric response don't always correlate. What irritates the stomach isn't necessarily the acid content alone, but also:

- **Caffeine**, which can increase gastric acid secretion.
- **Chlorogenic acids**, especially caffeoylquinic acid, which may affect gastric motility.
- **Volatile compounds** and **roasting byproducts**, which can irritate sensitive mucosa.

So, while organic acids play a role, they are not the sole cause of discomfort.

What the studies say

A review published in Food & Function (2020) and later discussions summarized by Victor R. Preedy (2023) highlight that the relationship between coffee consumption and gastric discomfort is complex and not fully explained by acidity alone.

Several compounds present in coffee — including **chlorogenic acid** derivatives, **caffeine** and roasting products such as **N-methylpyridinium** — have been suggested to influence gastric acid secretion and gastrointestinal responses.

As a result, coffees described as “low-acid” are sometimes perceived as less irritating, although this effect does not necessarily depend on their pH.

Brewing method may also play a role. For instance, **cold brew extraction** often results in lower concentrations of certain compounds extracted at higher temperatures and many consumers report it as more stomach-friendly, even when its pH is comparable to that of hot-brewed coffee.

Values are relative and represent schematic trends reported in the scientific literature. Actual values may vary depending on coffee origin, roasting degree, brewing method and analytical conditions.

Individual sensitivity matters

Just like lactose or gluten, **tolerance to coffee varies**. Some individuals are more sensitive to certain polyphenols or fermentation byproducts.

Others react more to unfiltered brews (e.g., French press), which carry more diterpenes and oils.

Because espresso is consumed in a much smaller serving size, the total intake of acids per serving may be lower than in larger coffee beverages such as filter coffee. However, espresso generally contains a higher concentration of dissolved compounds and the overall acid exposure ultimately depends on beverage volume, dilution and brewing parameters.

The role of roasting

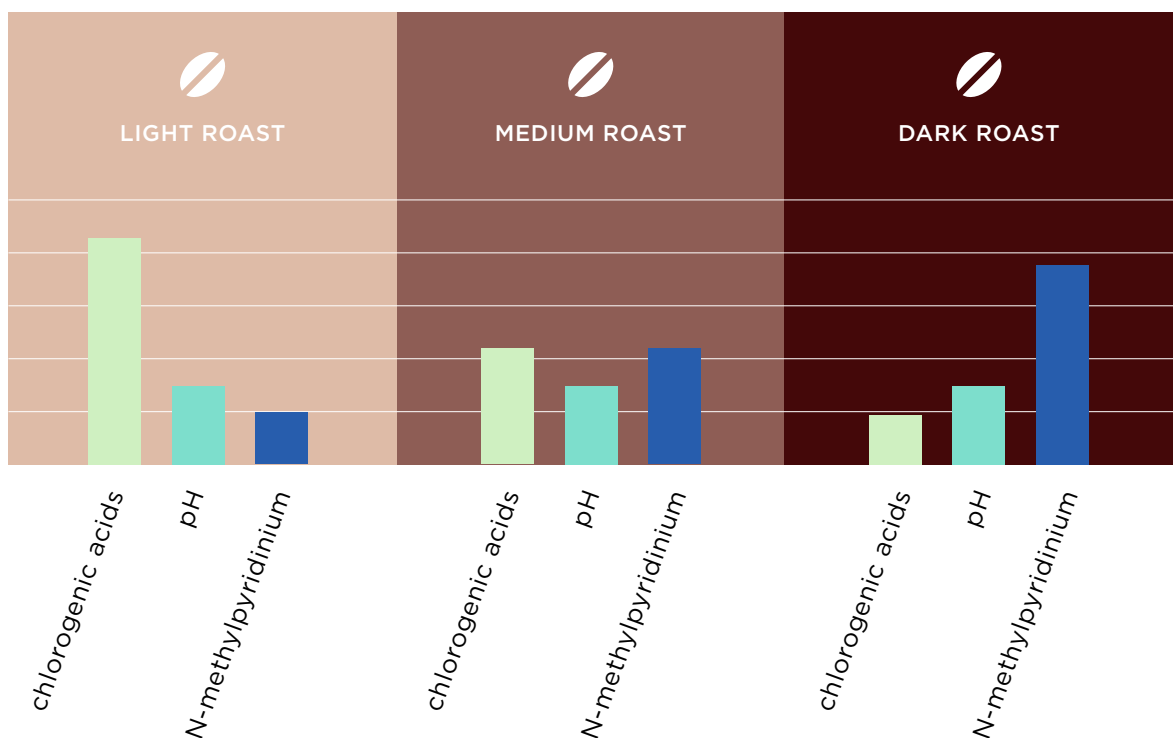
Dark roasts often feel “gentler” on the stomach not because they’re less acidic (pH can be similar), but because:

- They contain **less chlorogenic acids** (due to thermal degradation)
- They may increase **N-methylpyridinium**, a compound shown to **reduce gastric acid secretion in vitro**.

Thus, roast degree affects not just taste, but **physiological effects** too. Dark roasts often feel “gentler” not because they’re less acidic, but because they contain less chlorogenic acids and more compounds like N-methylpyridinium that may reduce gastric acid secretion.

Roast degree and compounds potentially involved in gastric response

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Marketing vs evidence

Many “low acid” coffees on the market are **marketed** based on pH values alone.

But as we’ve seen, **titratable acidity** and **compound profile** matter more than pH.

A coffee with pH 5.0 can be more irritating than one at 4.7 if it contains more caffeine and chlorogenic acids.

For sensitive drinkers, useful strategies include:

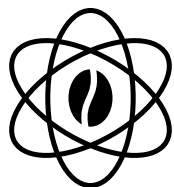
- **Choosing medium-to-dark roasted Arabicas**
- **Opting for washed coffees with balanced profiles**
- **Trying cold brew or espresso instead of large filter brews**
- **Watching brew strength and temperature.**

Why does it matter

Understanding the real role of acids helps us debunk myths and make informed choices. Coffee isn't inherently harmful to the gut. But its complex chemistry interacts uniquely with each body. Respecting that individuality is key.

Key Takeaway:

Stomach discomfort from coffee is not due to acidity alone. Compounds like caffeine, chlorogenic acids and certain roasting byproducts play a larger role. Roast degree, brew method, and individual sensitivity all influence how coffee is tolerated. Choosing darker roasts, milder origins, or cold brew can help sensitive drinkers enjoy coffee without discomfort.



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