NUTRINDX WHITE PAPER

Bioavailability: the number not on the label

Why two identical doses can deliver very different amounts to your body. A NutrIndx explainer.

The dose on the label is not the dose you absorb

A supplement label states how much of a nutrient is in the pill. It does not state how much crosses your gut wall and reaches your blood — that is bioavailability, and it can vary several-fold with chemical form and the food around it.

Before a nutrient can be absorbed it must first dissolve. The rate of dissolution rises as particle size falls and solubility increases (the Noyes–Whitney relationship), which is why micronized powders and more soluble salt forms tend to be absorbed better.

Form changes everything

Magnesium. Magnesium oxide is poorly absorbed relative to soluble organic salts such as citrate; the direction of this difference is well supported, while the exact percentage varies by study.

Vitamin D. Vitamin D_3 raises blood 25-hydroxyvitamin D more than D_2, an effect seen most clearly with large intermittent (bolus) doses; with daily dosing the difference is smaller.

Iron. Iron absorption is reduced by phytate in a dose-dependent way and is increased by vitamin C taken in the same meal.

Curcumin. Curcumin from turmeric is poorly absorbed on its own. Co-administering piperine (from black pepper) increased its measured absorption substantially in a small 1998 human study, although the precise magnitude is uncertain because the no-piperine control was near the limit of detection.

The engineering levers

Manufacturers raise bioavailability through particle-size reduction, choice of salt or ester form, and delivery systems such as liposomal or micellar carriers that shepherd poorly-absorbed molecules across the gut lining.

This is why “how it is made” can matter more than the number on the label: two products with the same stated dose can deliver very different amounts to the bloodstream.

Practical takeaways

Prefer soluble or chelated mineral forms when absorption is the goal; pair non-heme iron with vitamin C; and treat a single bioavailability percentage as an estimate, not a guarantee — individual responses differ.

References

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