WACKER

CREATING TOMORROW'S SOLUTIONS

INFO SHEET I CAVACURMIN® I DIETARY SUPPLEMENTS

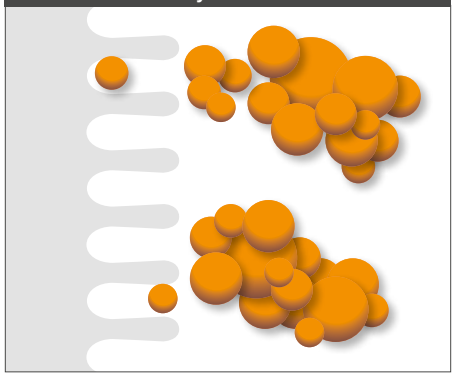
CAVACURMIN® – DISPERSIBLE CURCUMIN WITH SUPERIOR BIOAVAILABILITY

Curcumin and its derivatives, demethoxy-curcumin and bis-demethoxy-curcumin, commonly called curcuminoids, are the main active ingredients of the turmeric rhizome. Turmeric (botanical name: "*Curcuma longa*") has been widely used for centuries in the traditional Ayurvedic approach to nutrition. Modern science has provided a solid basis for such uses and current clinical trials make curcumin one of the best investigated natural compounds to date. Supplying the body with beneficial amounts of curcumin can be difficult, as it is insoluble in water and thus poorly bioavailable. CAVACURMIN® eliminates these problems.

The extensive pharmacological activities of curcumin are related to its ability to regulate various cellular processes and to act as a free-radical scavenger. While the bioavailability of diet-derived polyphenols varies greatly, curcumin is known to show very poor uptake efficiency. Translating the physiological activities of curcumin into clear benefits has thus proven difficult. Poor absorption in the digestive tract and rapid metabolism are the two main reasons for the lack of systemic availability. These circumstances limit curcumin's ability to reach its targets and exert its beneficial action.

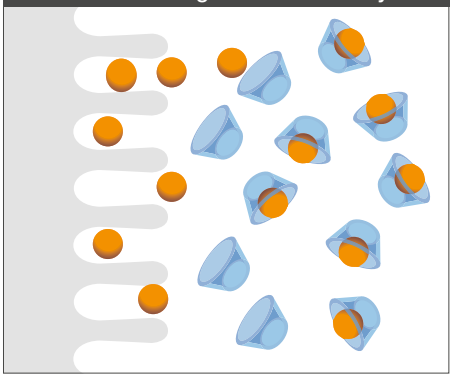
Although it is a helpful strategy to use curcumin in dietary supplements to provide larger amounts of curcuminoids, many products that are available on the market cannot ensure adequate biovailability.

Poor Bioavailability



Turmeric extract's molecules are hydrophobic and therefore agglomerate in the human body. As a result, only a few molecules are absorbed in the gut.

About 40 Times Higher Bioavailability



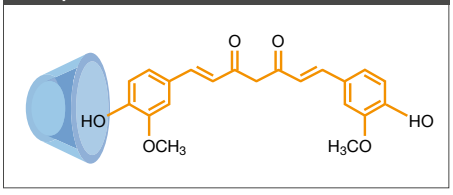
By creating a molecular dispersion through encapsulation of curcumin in gamma-cyclodextrin, much larger numbers of curcumin molecules are transported to the epithelial cell membrane.

The Solution: CAVACURMIN®

By complexation with the naturally occurring vegetarian oligosaccharide CAVAMAX® W8 gamma-cyclodextrin, which has GRAS approval and is recognized as a novel food ingredient, WACKER offers an excellent solution for increasing the bioavailability of hydrophobic health-promoting ingredients like curcumin. The special feature of this oligosaccharide is its donut-shaped, three-dimensional structure: it creates an inner hydrophobic cavity capable of accommodating a lipophilic molecule like curcumin as a "guest." The hydrophilic exterior, on the other hand, ensures compatibility in aqueous systems.

In the presence of water, CAVAMAX® W8 gamma-cyclodextrin leads to molecular dispersions, greatly enhancing the bioavailability of the hydrophobic curcumin.

Encapsulated Curcumin



Gamma-cyclodextrin functions as the hydrophilic carrier for hydrophobic curcumin, which is bound by the inner cavity of the gamma-cyclodextrin.

Formulations with CAVAMAX® W8 gamma-cyclodextrins are based on simple van der Waals bonds and do not change the nutritional value or functionality of the ingredient. Thanks to CAVACURMIN®, WACKER now offers a highly bioavailable curcumin powder.

Human Clinical Study Results

The European Journal of Nutrition published the peer-reviewed study on the exceptional bioavailability of CAVACURMIN® in February 2017. Download the full-length paper at **www.wacker.com/cavacurmin**

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Enhanced Bioavailability – How?

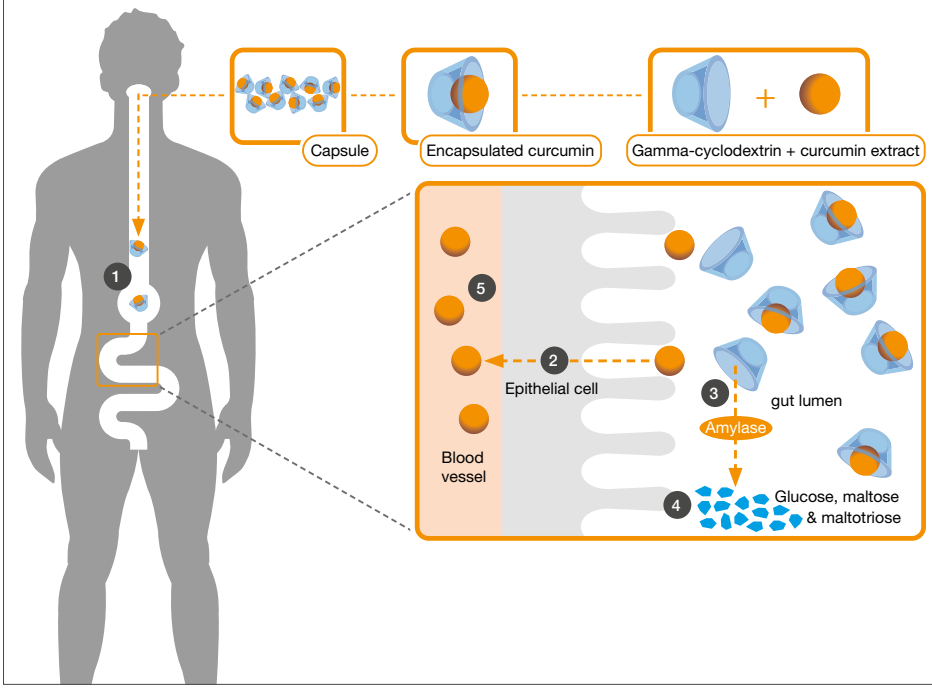
The increased bioavailability seems to correlate with an enlarged surface of curcumin molecules. Pure turmeric extract agglomerates in the human body. Only a few curcumin molecules from the small surface area of the agglomerates will be absorbed, while most are excreted without being absorbed. Creating a molecular dispersion through encapsulation of curcumin with CAVAMAX® W8 gamma-cyclodextrin allows much larger numbers of these molecules to be transported into the upper intestinal tract, where only the curcumin molecules are absorbed into the body. This is why our human bioavailability study found absorption of CAVACURMIN® to be about 40 times higher (please see additional information sheet).

For a Variety of Applications

CAVACURMIN® comes as a dry, free-flowing powder. It is thus especially well suited for use in dry or powdery dietary supplement products, such as tablets, capsules and nutritional bars. Since it disperses easily in aqueous systems, it is also suitable for use in beverages. CAVACURMIN® is produced using a naturally occurring oligosaccharide (not chemically produced) as a hydrophilic carrier: CAVAMAX® W8 gamma-cyclodextrin.

Our experts look forward to partnering with you to help you create the healthy, bioavailable products of tomorrow.

Mechanism of CAVACURMIN® Absorption



1. Taken as a dietary supplement, mostly in the form of a capsule, CAVACURMIN® is transported unchanged through the stomach into the upper intestinal tract.
2. There, only the curcumin molecules are absorbed into the body from the epithelial cell membrane.
3. The oligosaccharide gamma-cyclodextrin is hydrolyzed by human pancreatic amylase, yielding mainly maltose, some maltotriose and smaller amounts of glucose.
4. Maltose and maltotriose are degraded to glucose, which is then absorbed from the small intestine into the blood.
5. According to our human bioavailability study, about 40 times more curcumin is absorbed directly into the blood vessels, compared to pure curcumin powder and some leading commercial curcumin supplement products.

CAVACURMIN®

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