WACKER

CREATING TOMORROW'S SOLUTIONS

INFO SHEET I CAVACURMIN® I STUDIES

CAVACURMIN® – SCIENTIFIC EVIDENCE OF SUPERIOR BIOAVAILABILITY

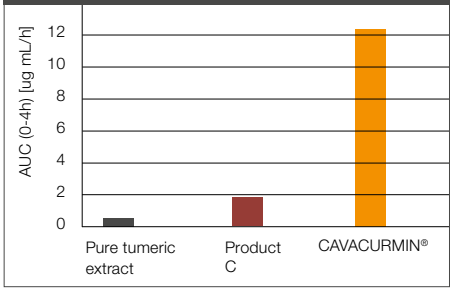
Supplying the body with beneficial amounts of curcumin can be difficult, as it is poorly bioavailable. CAVACURMIN® eliminates these problems.

While the bioavailability of diet-derived polyphenols varies greatly, curcumin is known to show very poor uptake efficiency. Poor absorption in the digestive tract and rapid metabolism limit curcumin's ability to reach targets that are distant from the intestines and exert its beneficial action. Providing larger amounts of curcuminoids through the intake of additional curcumin in dietary supplements may seem helpful, but adequate biovailability is still an issue.

The Solution: CAVACURMIN®

WACKER has successfully enhanced the bioavailability of curcumin and now offers the cyclodextrin-based curcumin formulation CAVACURMIN®. Various scientific studies conducted by WACKER have demonstrated high bioavailability by comparing CAVACURMIN® to pure turmeric extract as well as to different commercial curcumin products (A: with turmeric oil, B: phospholipid complex, C: with piperine).

Figure 1: Rodent Model – High Bioavailability of CAVACURMIN® as Measured by Total Curcuminoids



Total curcuminoids: sum of free curcumin, curcumin sulfates and curcumin glucuronides.

In Vivo Bioavailability in a Rodent Model (2009)

Setup:

Total concentrations of curcuminoids in the blood plasma (0-4 hours) of Sprague Dawley rats were recorded after one oral gavage (500 mg/kg bw) of three curcumin preparations: pure turmeric extract, a comercial product (Product C) and CAVACURMIN®. Plasma was analyzed for free curcumin and curcumin metabolites (curcumin sulfates and curcumin glucuronides) by HPLC (0-4 hours).

Results:

Animals that received CAVACURMIN® had 8 to 20 times more total curcuminoids in their blood plasma (expressed as the sum of free curcumin and its metabolites) than animals that received a commercial product or pure curcumin powder.

Conclusion:

This huge difference in HPLC-measured curcumin metabolites indicates that the maximum amount of curcumin was delivered to the blood stream of the rats, which can only be explained by the presence of very highly bioavailable CAVACURMIN® (see Figure 1).

In Vitro Bioavailability in a Human Caco-2 Model (2011)

Setup:

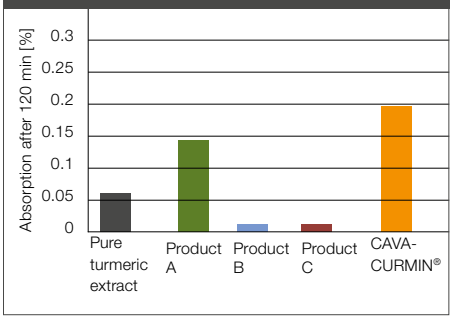
This study investigated the dissolution profile of five curcumin preparations (pure turmeric extract, CAVACURMIN® and three leading commercial curcumin products A, B, C) in simulated intestinal fluid (SIF, 0.5% SDS) followed by the uptake of Caco-2 cells (human intestinal cell model).

Results:

CAVACURMIN® dissolved up to five times more efficiently than leading commercial curcumin supplement products or curcumin powder itself.

The following uptake study with human Caco-2 cells also demonstrates the superior performance of CAVACURMIN®. Here uptake was up to 10 times higher than was the case for other leading commercial curcumin formulations or for curcumin powder itself (see Figure 2).

Figure 2: Caco-2 Model – Absorption of CAVACURMIN® in Comparison to Leading Commercial Products



Conclusion:

These results clearly underscore the significant increase in bioavailability of curcumin in a cyclodextrin-based formulation.

Human Clinical Study Results

The European Journal of Nutrition published the peer-reviewed study on the exceptional bioavailability of CAVACURMIN® in February 2017. Please see the back page for the summary or download the full-length paper at **www.wacker.com/cavacurmin**

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Human Bioavailability in a Clinical Study (2013)

Setup:

The relative absorption of CAVACURMIN® was compared to a standard 95% turmeric extract and to two leading commercial products (A and B) claiming to have enhanced bioavailability in a clinical setting. In this double-blind, crossover study, 12 individuals (fasted overnight) were given ~ 376 mg of curcuminoids in capsules (5x more of pure turmeric extract to ensure a measurable intake, which was taken into consideration when calculating the results) with a one-week washout period in between the four formulations. After product intake, blood was drawn hourly for 12 hours and analyzed (spiked plasma samples). Blood concentration and the relative absorption of curcumin and its derivatives were determined.

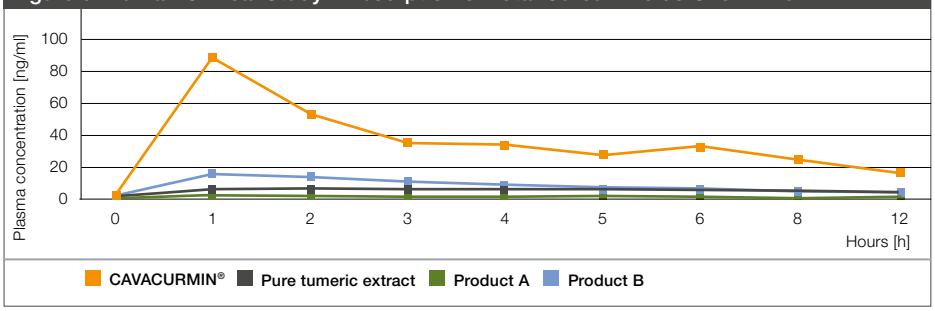
Results:

CAVACURMIN® was about 40 times more efficiently absorbed than leading commercial curcumin supplement products or curcumin powder itself. The highly superior performance of CAVACURMIN® was demonstrated by the fact that curcumin uptake was at least 4.6 times higher than the next-best commercial curcumin formulation in this clinical study (see Figures 3 and 4).

Conclusion:

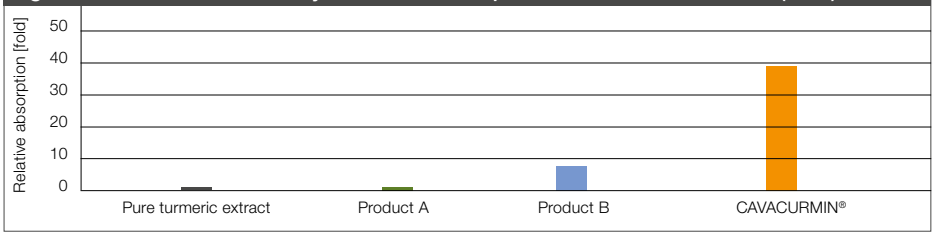
These results clearly corroborate the significant increase in bioavailability of curcumin in a cyclodextrin-based formulation.

Figure 3: Human Clinical Study - Absorption of Total Curcuminoids Over Time



Already 1 hour after ingestion of CAVACURMIN® the curcuminoids concentration in the blood was significantly higher than for all other commercial formulations and remained elevated for 12 hours.

Figure 4: Human Clinical Study - Relative Absorption of Total Curcuminoids (AUC)



CAVACURMIN® is ~ 40 times more bioavailable than pure turmeric extract. This enables a smaller dosage for the same effect.

Furthermore, these data suggest that CAVACURMIN® can provide the benefits of the powerful antioxidant curcumin to a much greater extent than existing commercial products.

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.

CAVACURMIN®

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