



The world's most bioavailable curcumin in a single dose[†]



HydroCurc[®]

Introducing HydroCurc[®]

HydroCurc[®] is a cold water dispersible (CWD) *Curcuma longa* extract powder, specifically designed to increase bioavailability of curcuminoids. In aqueous environments (such as the stomach), the specifically designed curcumin particles freely disperse. This net effect translates to increased bioavailability.

With over 85% curcuminoids and shown in published pharmacokinetic studies to deliver 807 ng/ml curcuminoids in blood plasma, HydroCurc[®] supplies the highest load of curcuminoids in a cold water dispersible formulation.

Fat-soluble compounds have limited solubility in the watery gastrointestinal environment and follow the same pathway of intestinal absorption as other fats that are consumed. Various fat-soluble substances, including curcumin, offer great benefit to human health. But in the absence of adequate absorption, such benefit cannot be fully realized.

The LipiSpurse® Advantage

Cold Water Dispersible (CWD) Powders using LipiSpurse®

LipiSpurse® is a dispersion technology for lipophilic (hydrophobic or water hating) powders.

It is a patented delivery system improving the bioavailability of lipophilic substances. This is due to its capacity to facilitate gastrointestinal absorption and reduce or eliminate the effect of food on the absorption of poorly water- soluble bioactive compounds. It also increases the functionality.

CWD powders have an equilibrium established between the LipiSpurse® on the powder surface and the LipiSpurse® in the solution.

Cold water dispersible HydroCurc® =

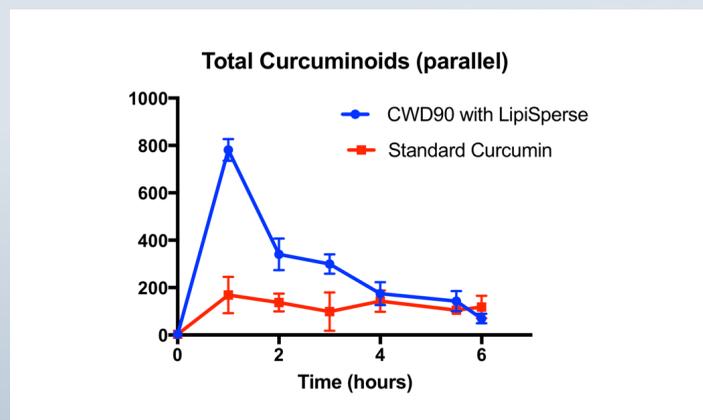
- Improved efficacy
- Faster onset of action
- Lower doses
- Improved user compliance.

Pharmacokinetic Study

LipiSpurse® is a novel system tailored to increase the dispersion of crystalline lipophilic agents in aqueous environments. The present study aimed to compare the pharmacokinetics of a single dose of a commercially available curcumin product with a curcumin-LipiSpurse® delivery system.

A single dose, randomized, double-blinded, crossed over, absorption study of curcuminoids over a 24-hour period at University of Queensland. N= 18 male & females (18-30 years) 7 crossed over.

Single dose (750mg)



Cmax = 807 ng/ml
 Tmax = 1 hr
 Total AUC = 2,492 ng/ml
 P<0.05

Results

HydroCurc® delivered significantly higher plasma curcuminoid concentrations compared to the raw curcumin product.

†Highest bioavailability per mg in the industry to date

* These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.



Repulsive forces between the particles prevent agglomeration or aggregation: allowing HydroCurc® to have proper particle dispersion.

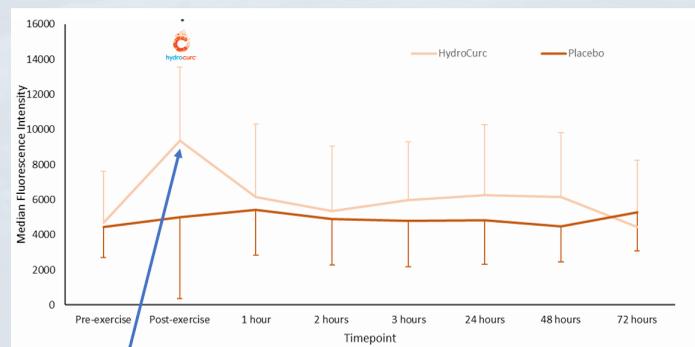


Limited Dispersion: Small effective specific surface area = Limited Bioavailability
 Perfect Dispersion: Large effective specific surface area = Enhanced Bioavailability

Exercise Recovery Study

A double-blind, randomized, placebo-controlled study was conducted to evaluate the effect of orally dosed HydroCurc® on exercise recovery in healthy males. The study was conducted with 28 recreationally trained, healthy males aged between 18 and 35 years old. Muscle fatigue was induced using leg press and completion of 4 sets for as many repetitions as possible, with 1-minute rest between sets. After muscle fatigue was induced; blood parameters, VAS pain score, thigh circumference and questionnaires were completed.

Akt/PKB Activation



Significant increase in Protein Kinase B median fluorescence intensity from baseline to 30 mins in the HydroCurc® group (*) after a single dose of HydroCurc®

Results

HydroCurc® was shown to significantly:

- Lower pain score post-exercise (DOMS)
- Reduce lactate levels post-exercise
- Lower inflammatory markers (IL-6)
- Reduce thigh circumference (back to baseline)

Cognitive Study

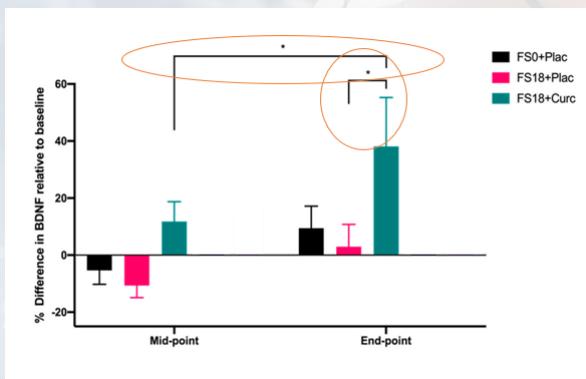
Brain-Derived Neurotrophic Factor (BDNF) is a critical neuroprotein that plays a structural role in the Brain and nervous system and helps support normal Brain function.

BDNF supports healthy nerve cells and plays a role in growth and maintenance of neuronal cells. In the brain, BDNF is present at the connection between nerve cells and may support healthy cell to cell communications take place.

Recent research also shows that BDNF is found in regions of the brain associated with control of eating, drinking, and body weight.

A 6-week double-blind, placebo-controlled, randomized study. Effects of co-administering oral iron supplementation with HydroCurc® on serum BDNF levels in healthy adults. 155 healthy adults (18-40 yrs). Outcomes measured: Change in serum BDNF levels and Change in Ferritin levels.

BDNF Serum Levels



BDNF results were statistically significant between HYDROCURC + FS 18 group vs Placebo + FS 18 group. There was also statistical significance between HYDROCURC + FS 18 group vs FS0 + Placebo group.

BDNF Levels Mean BDNF (ng/mL) values per treatment group/ timepoint (mean±SEM)

Timepoint	FS0+Plac	FS18+Plac	FS18+Curc
Baseline	35.18 ± 2.10	37.16 ± 1.88	30.28 ± 1.54
Mid-point	31.50 ± 1.27	32.00 ± 1.48	31.42 ± 1.02
End-point	36.62 ± 2.17	36.04 ± 1.66	39.17 ± 4.96

Ferritin Levels Low Baseline Ferritin (<50 µg/L)

Timepoint	FS0+Plac	FS18+Plac	FS18+Curc
Baseline	25.08 ± 1.73	25.29 ± 2.81	30.25 ± 2.52
Mid-point	28.23 ± 2.96	34.59 ± 4.24	36.45 ± 2.92
End-point	31.39 ± 5.12	33.31 ± 3.39	40.89 ± 4.99 **

Significant increase in ferritin levels at endpoint compared to baseline in: HydroCurc®+FS18 group (35.17%)

Normal Baseline Ferritin (≥50 µg/L)

Timepoint	FS0+Plac	FS18+Plac	FS18+Curc
Baseline	91.38 ± 12.94	109.17 ± 13.30	98.79 ± 15.37
Mid-point	93.37 ± 13.75	100.10 ± 16.85	102.23 ± 13.56
End-point	87.88 ± 11.45	100.21 ± 13.27	102.32 ± 16.18

No significant effect observed in ferritin levels over time or between groups

Results

Co-administration of a HydroCurc® with 18 mg elemental Iron for 42 days can increase serum BDNF levels.

Those with low ferritin levels may benefit from taking 500mg Hydrocurc® with 18mg Iron by:

- Increasing serum BDNF levels in individuals
- Enhancing ferritin formation
- Correcting iron deficiency

Iron deficiency can lead to impaired cognition, among other issues.

Previous studies have shown that independently, curcumin and iron are associated with improved BDNF levels. In present study, co-administration shown to result in increased serum BDNF levels.

HydroCurc® when combined with Iron increases the levels of BDNF

Think of brain-derived neurotrophic factor as fertilizer for your brain. You have billions of neurons (aka brain cells), and BDNF keeps them flourishing and strong. When you release BDNF, it flips the switch on a series of genes that grow brand-new brain cells and pathways. BDNF also strengthens the neurons you already have. Along with keeping you mentally alert and improving memory.

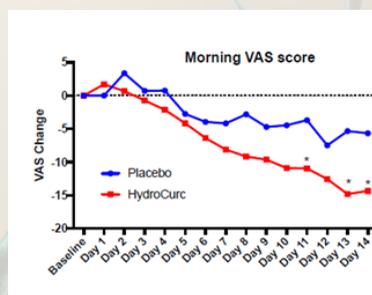
As you get older, your levels of brain-derived neurotrophic factor naturally start to fall, so BDNF levels decrease with age.⁷

Joint Health Study

Joint Health in an Adult Population – HydroCurc Compared to a Placebo in a randomized, double-blind study.

A randomized, double-blind placebo-controlled study investigated the efficacy of HydroCurc on joint pain over a 2-week period. Group 1 – HydroCurc (40). Each participant randomized to this arm was assigned the investigational product and instructed to take 500mg once daily with water. Group 2 –Placebo (40). Each participant randomized to this arm was assigned placebo and instructed to take the product per the same instructions as the active arms.⁸

Change in VAS score morning and evening over 2 weeks. * significant difference between groups p<0.05



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Results

HydroCurc® showed relief of joint pain with a statistically significant difference compared to placebo in two weeks for morning joint pain. Fast Acting:

- Significant versus baseline in 5 days
- Significant versus Placebo in 11 days

HydroCurc® Benefits

Curcuminoids have been widely studied for their benefits such as:

- Powerful Ayurvedic antioxidant and anti-inflammatory*
- Supporting joint health*
- Assisting in sports recovery*
- Supporting liver health*
- Promoting general health*
- Supporting heart health*
- Reducing the normal effects of DOMS*
- Supporting cognitive health*

Award winning ingredient and technology

- HydroCurc® Winner NutraIngredients Asia Botanical of the Year 2018
- LipiSpense® Finalist NutraIngredients Asia Editors Award for Innovation 2018
- HydroCurc® Finalist NutraIngredients Botanical of the Year 2018
- HydroCurc® Finalist NutraIngredients Editors Award for Innovation 2018
- LipiSpense® Semi Finalist Australian Technologies Competition 2018
- HydroCurc® Finalist NutraIngredients Sports Nutrition Ingredient of the Year 2019
- LipiSpense® Winner NutraIngredients Editors Award for Functional Food Innovation of the year 2019
- HydroCurc® Finalist NutraIngredients Asia Healthy Ageing Ingredient of the Year 2019
- LipiSpense® Winner NutraIngredients Asia Nutrition Research Project of the Year 2019
- LipiSpense® Winner European Specialist Sports Nutrition Award Most Innovative Idea for the year 2019

- HydroCurc® Finalist NutraIngredients Sports Nutrition Ingredient of the Year 2020
- LipiSpense® Finalist NutraIngredients Nutrition Research Project of the Year 2020
- HydroCurc® Finalist NutraIngredients Cognitive Function Ingredient of the Year 2020
- Hydrocurc Winner NutraIngredients Asia Cognitive Function Ingredient of the Year 2020

HydroCurc® can be used in novel formats

- Ready-to-mix powders
- Effervescent tablets
- Sachets
- Gels / Gummies
- Drinks / liquids / shots



- ¹ Briskey, D. Sax, A., Mallard, A.R., and Rao, A., "Increased bioavailability of curcumin using a novel dispersion technology system (LipiSpense®)." 2018. European Journal of Nutrition. <https://doi.org/10.1007/s00394-018-1766-2>
- ² Mallard, A.R., Briskey, D., Richards, A., and Rao, A., "Curcumin Improves Delayed Onset Muscle Soreness and Post-Exercise Lactate Accumulation." 2020. Journal of Dietary Supplements. <https://pubmed.ncbi.nlm.nih.gov/32705925/>
- ³ Lorinczova, H.T., Fitzsmos, O., Mursaleen, L., Renshaw, D., Began, G., and Zriwala, M.G., "Co-Administration of Iron and a Bioavailable Curcumin Supplement (HydroCurc®) Increases Serum BDNF Levels in Healthy Adults." 2020. Journal of Antioxidants. <https://pubmed.ncbi.nlm.nih.gov/32707771/>
- ⁴ Yamada K, Nabeshima T (April 2003). "Brain-derived neurotrophic factor/TrkB signaling in memory processes". Journal of Pharmacological Sciences. 91 (4): 267–70. doi:10.1254/jphs.91.267. PMID 12719654.
- ⁵ Bekinschtein P, Cammarota M, Katche C, Slipczuk L, Rossato JI, Goldin A, Izquierdo I, Medina JH (February 2008). "BDNF is essential to promote persistence of long-term memory storage". Proceedings of the National Academy of Sciences of the United States of America. 105 (7): 2711–16. Bibcode:2008PNAS.105.2711B. doi:10.1073/pnas.0711863105. PMC 2268201. PMID 18263738.
- ⁶ Ernfors P, Kucera J, Lee KF, Loring J, Jaenisch R (October 1995). "Studies on the physiological role of brain-derived neurotrophic factor and neurotrophin-3 in knockout mice". The International Journal of Developmental Biology. 39 (5): 799–807. PMID 8645564.
- ⁷ Tapia-Arancibia L, Aliaga E, Silhol M, Arancibia S (November 2008). "New insights into brain BDNF function in normal aging and Alzheimer disease". Brain Research Reviews. 59 (1): 201–20. doi:10.1016/j.brainresrev.2008.07.007. PMID 18708092
- ⁸ Amanda Rao (Ph.D.), David Briskey (Ph.D.) "Joint Health in an Adult Population – HydroCurc Compared to a Placebo in a randomised, double-blind study." 2020 RDC Clinical.



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