

What is neoQmin™ ?

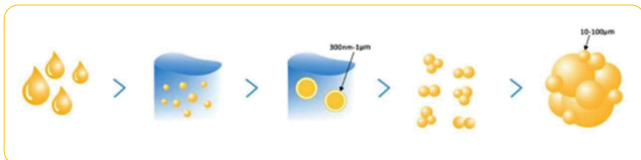
neoQmin™ is a curcumin product with higher water dispersibility, which is designed to absorb fast and easy. neoQmin™ is made on the basis of micro-encapsulation technology and able to be used for formulation of various drinks as well as confirmed safety.

What is Curcumin?

Curcumin is a bright yellow compound discovered in various plants. It is a main curcuminoid of *Curcuma longa* as a type of Zingiberaceae. Curcumin is largely used for supplements, cosmetics, food flavor, food pigment, etc.

Micro-encapsulation Technology

Micro-encapsulation is the process of providing small capsules with many useful features surrounded by coating with small particles or tiny water drops. It is generally used to integrate food ingredients, enzymes, cells or other substances below micrometer size.



Picture 1. Micro-encapsulation Process

Advantages of neoQmin™

1. Confirmed Safety
2. High Water Dispersibility
3. Faster Absorption of Curcumin
4. High Bioactive Function like Liver Protection

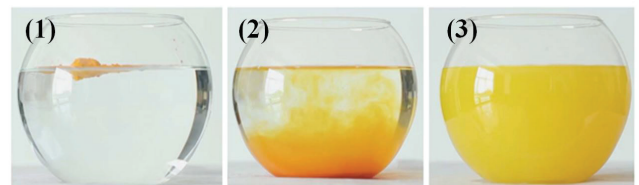
Safety Evaluation

The safety of neoQmin™ has been already confirmed by the following toxicity tests.

- Single Oral Toxicity Test
- Oral Administration of Micronucleus Test
- Chromosome Numerical Test
- Mutation Test

High Water Dispersibility

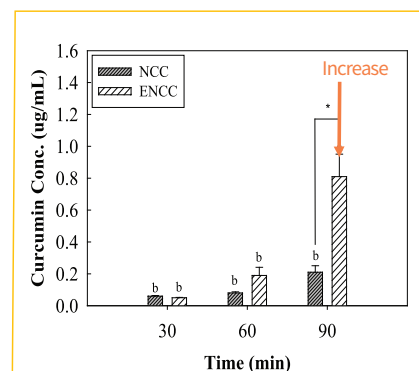
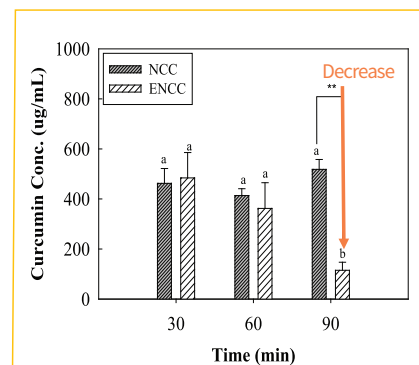
neoQmin™ based on micro-encapsulation technology has much superior water dispersibility than other curcumin products.



Picture 2. Comparison of Water Dispersibility
(1) Curcuma Power (2) Water-soluble Curcumin Power (3) neoQmin™

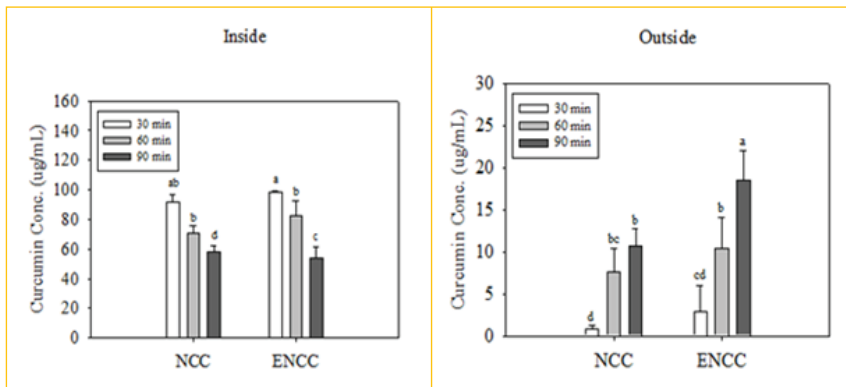
Evaluation of neoQmin™ Absorption Ratio

(1) Evaluation of In Vitro Absorption Ratio using Non-everted Sac



Picture 3. Evaluation of Absorption Ratio
Curcumin Concentration of the Inside (Top) and the Outside of Sac (Bottom)
(NCC: General Curcumin, ENCC: neoQmin™)
Reference: Prev. Nutr. Food Sci. 2019;24(4):410-417

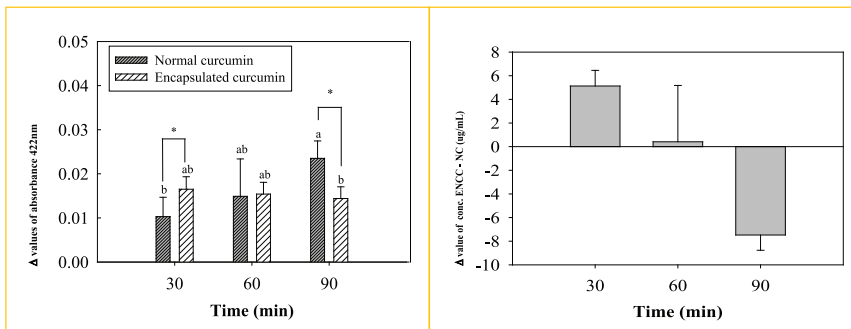
(2) Evaluation of In Vitro Absorption Ratio using the epithelial cell line of Caco-2 small intestine



Picture 4. Evaluation of Caco-2 In Vitro Absorption Ratio
Reference: Prev. Nutr. Food Sci. 2019;24(4);410-417

The concentration outside the enterocyte of neoQmin™ is significantly higher than that of general curcumin. It means that neoQmin™ is more effective to pass through the lipid layer of the epithelial cell membrane than general curcumin.

(3) Evaluation of In Vivo Absorption Ratio by Single Oral Administration



Picture 5. Changes in Curcumin Absorbance Over Time in Rat Serum
Reference: Prev. Nutr. Food Sci. 2019;24(4);410-417

neoQmin™ has higher curcumin concentration in blood than that of general curcumin after 30 minutes. It means that neoQmin™ can be absorbed very fast in the body after intake.

Improvement on Alcoholic Liver Damage

Reference: Prev. Nutr. Food Sci. 2019;24(4);410-417

Group	GPT(U/L)	GOT(U/L)	LDH(U/L)	TCHO(mg/ dL)	TG(mg/ dL)
NOR	30.25 ± 0.48 ^{cd}	44.50 ± 0.65 ^d	212.25 ± 6.92 ^b	86.75 ± 6.80 ^c	118.00 ± 6.22 ^d
CON	43.25 ± 0.63 ^a	62.00 ± 0.41 ^a	315.00 ± 12.48 ^a	245.75 ± 15.20 ^a	219.25 ± 3.57 ^a
NC(L)	35.75 ± 1.38 ^b	55.75 ± 0.25 ^b	242.75 ± 15.77 ^b	173.50 ± 16.54 ^b	206.75 ± 7.10 ^b
NC(H)	34.75 ± 0.63 ^{bc}	53.75 ± 0.25 ^b	162.25 ± 11.48 ^c	100.00 ± 2.16 ^c	148.25 ± 14.56 ^c
EC(L)	32.00 ± 2.86 ^{bc}	54.75 ± 1.03 ^b	225.25 ± 15.52 ^b	90.00 ± 4.92 ^c	187.25 ± 8.92 ^b
EC(H)	25.50 ± 2.25 ^c	48.50 ± 1.26 ^c	115.50 ± 6.08 ^d	83.75 ± 1.11 ^c	126.50 ± 8.65 ^d

- GOT (glutamate oxaloacetate transaminase), GPT (glutamate pyruvate transaminase) : The content is increased in the necrosis of liver cells and the destruction of tissues and they are utilized as an index of liver damage (disease).
 - LDH (lactate dehydrogenase, An enzyme that acts when the sugar in the body breaks down and turns lean acid into lactic acid) : The content is increased in cytolysis and it is utilized as an index of liver damage (disease).
 - TCHO (total cholesterol), TG (triglyceride) : They are utilized as an index of alcoholic fatty liver.

All groups of neoQmin™ are significantly lower than the control group in GPT, GOT, LDH, TCHO and TG. In particular, the high-content group of neoQmin™ has more significant effect than general curcumin groups in GOT, LDH and TG. It means that neoQmin™ is more effective in recovering alcoholic liver damage than general curcumin.

Product Information

neoQmin™ 1%	Easy to drink with drinks or water due to low concentration and viscosity
neoQmin™ 12%	Easy to drink with drinks or water due to low concentration and viscosity
neoQmin™ 20%	Maximum effect with small amounts of curcumin due to high concentration and viscosity and easy to use for rice coating or food additives

Item	Quality Standard
	Liquid
Appearance	Pale yellow liquid with a unique smell and taste
Solid Content(Brix)	≥ 20.0 %
Moisture(%)	≤ 80.0 %
Content of Curcumin	≥ 12.0 %
Tar Color	Not Detected
Coliform Group	Negative
Packing Unit	20kg(PE)