QUEST

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Liposomal

Glutathione 500mg

Increased bioavailability and absorption

Nutritional Information

One capsule provides:

Liposomal glutathione	500 mg
providing:	
Reduced glutathione	200 mg

Take one to two capsules daily with food. Swallow with water.

SUMMARY

- Advanced delivery of oral glutathione.
- High bioavailability and absorption of glutathione.
- Increased cellular delivery of glutathione.
- Highly stable glutathione and protected from degradation.
- Liposomal glutathione is well tolerated.
- Supported by studies and advanced manufacturing processes.

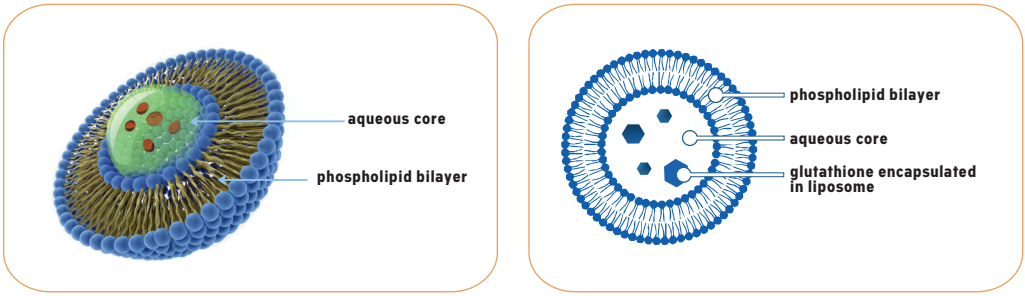
LIPOSOMES & LIPOSOMAL DELIVERY

Liposomes are a form of lipid-based delivery that promote intestinal absorption, intracellular uptake and bioavailability of active nutrients, such as glutathione. Liposomes are microscopic-sized spherical envelopes or pockets containing an aqueous core. The phospholipids are arranged into a spherical cell membrane like lipid bilayer, knows as a phospholipid bilayer.

Liposomes structures can be used for advanced delivery of glutathione, which is then described as liposomal glutathione. The liposomal glutathione is created through a careful manufacturing process resulting in an innovative delivery form of the nutrient with significant advantages for the consumer.

In the case of water-soluble nutrients (hydrophilic), such as glutathione, the active nutrient is entrapped inside the aqueous core of the liposome.

Illustrations of liposomal glutathione structure



ADVANTAGES OF LIPOSOMAL DELIVERY OF GLUTATHIONE

The advantages of liposomal nutrients are derived from the liposome structure itself. Glutathione is contained within the aqueous core and is sealed and encapsulated. Liposomal encapsulation provides a barrier around the active glutathione, increasing resistance to digestive enzymes, acidity, intestinal flora, and oxidation.[1] This results in the protection of the glutathione from degradation and oxidation as well as protecting the digestive tract from potential irritation, thereby improving delivery and bioavailability. In addition, interactions between the liposome's phospholipid bilayer membrane and the body's cell membranes offer enhanced cellular uptake through endosomal mechanisms.

As a result, the advantages of liposomal nutrients include:

- High bioavailability and absorption of glutathione compared with conventional oral forms of glutathione.
- Protection of glutathione against the acid environment of the stomach, oxidation, and degradation.
- Increased transmucosal (oral) uptake and absorption of glutathione.
- Increased intracellular delivery of glutathione.
- High stability of glutathione.
- Cost effective by being able to take a lower dose of glutathione for the same effect.

STUDY OF LIPOSOMAL DELIVERY OF GLUTATHIONE

An in-vitro study investigating the replenishment of intracellular glutathione through oral supplementation found that liposomal glutathione was 100-times more potent compared to conventional glutathione oral administration.[2]

Another study found daily supplementation with 500mg of liposomal glutathione for two weeks significantly increased the body stores of glutathione (increases >40%), increased immune function biomarkers (Natural Killer Cell Cytotoxicity increase >400%) and reduced oxidative stress markers (decrease >35%). [3]

OVERCOMING THE ISSUES WITH CONVENTIONAL GLUTATHIONE SUPPLEMENTATION

Glutathione is particularly susceptible to oxidation and destruction in the acid environment in the stomach and has very poor absorption when provided in a conventional form.

Oral supplementation of glutathione in liposomal form offers significant advantages of in vivo delivery due to the protective encapsulation provided by the liposome structures protecting the active glutathione from damage by stomach acid.

LIPOSOMAL MANUFACTURING PROCESS

The Liposomal nutrients used by Quest are supplied by Lipsovit® and manufactured using a carefully controlled manufacturing process and the liposome structures are additionally verified using cryogenic transmission and scanning electron microscopy. Particle size plays a vital role in nanoparticle adhesion to and interaction with biological cells in the body.[4,5] At Quest we use Liposomal nutrients within a particle size of 200-400 nanometres (nm), ensuring they are a highly effective delivery system. The size of the liposomes and their particle size distribution are determined using a LUMiSizer® 651 particle size analyzer.

Image of Lipsovit® liposome structures using cryogenic transmission electron microscopy.

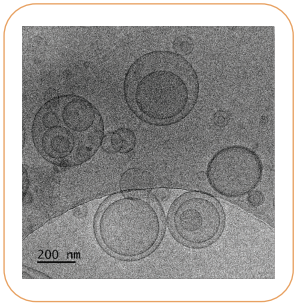


Image of Lipsovit® liposome structures using x1000 magnification under scanning electron microscope.

BENEFITS OF GLUTATHIONE SUPPLEMENTATION

Glutathione is composed of three protein building blocks: cysteine, glycine, and glutamic acid. It is found in all cells in the body and acts as a master antioxidant that can protect against free radicals and cellular damage. As a result, glutathione deficiency contributes to oxidative stress, which plays a key role in ageing and the pathogenesis of many diseases.

Glutathione helps detoxify chemicals, including some that the body creates naturally, as well as pollutants and external chemicals. Glutathione can also reduce inflammation and oxidative stress in the liver, improving overall liver function.

The body produces less glutathione as it ages, and as a result the body's ability to protect against cellular damage by free radicals, chemicals and pollutants decreases. Individuals that smoke, drink alcohol, or take pharmaceuticals should also consider glutathione supplementation.

HEALTH NEEDS

SPECIALIST HEALTH

DETOX & CELL PROTECTION

IMMUNITY

SCIENTIFIC REFERENCES

1. Nanoscale Res Lett 8, 102 (2013)
2. Neurochem Res. 2010 Oct;35(10):1575-87
3. Eur J Clin Nutr. 2018 Jan;72(1):105-111
4. Biomaterials. 2005;26: 2713-2722
5. Small. 2010;6:12-21

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