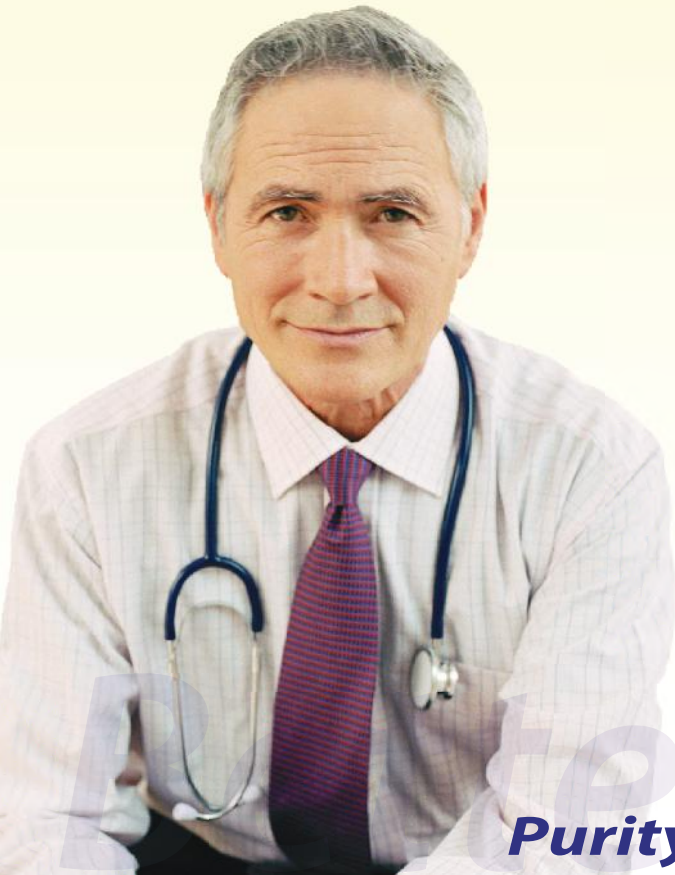


**micro D<sup>3</sup>**  
... (optimized vitamin d-3)

# Optimized Vitamin D-3

With Advanced M.E.D.S Technology



Nutrasal  
**m.e.d.s tech**<sup>®</sup>  
... (sub micron emulsion delivery system)

*Purity you expect. Quality you trust.*

**Advanced Lipid Science**  
Delivery | Absorption | Bioavailability

**Nutrasal**  
... Advanced Lipid Science

**micro D<sup>3</sup>**  
 .. (optimized vitamin d-3)

Micro D-3 leverages our advanced Sub Micron Emulsion Delivery System (M.E.D.S Technology) to increase absorption and bioavailability up to 10 times. This allows for lower doses to safely increase vitamin D-3 levels.

Research suggests vitamin D-3 promotes strong bones, regulates calcium in all cells, protects the immune system, and provides antioxidant benefits, among others.\*



**OPTIMIZED BIOAVAILABLE VITAMIN D-3**

**Vitamin D-3 with M.E.D.S Technology**

Each Serving Contains: (1 Drop)

Vitamin D-3 2000 IU

Total 1 oz. (30ml) - 916 Servings

**What is Micro D-3?**

Micro D-3 is an optimized form of vitamin D. And, unlike other vitamin D, Micro D-3 is superior in particle size, delivery technology, absorption and bioavailability.

Vitamin D-3 doses have been steadily increasing from 400 IU to 2000 IU per day. And, in many cases, Doctors and Healthcare Professionals are recommending doses in excess of 5000 IU per day.

*More important than total dose is how much is absorbed. An increasing number of researchers and healthcare practitioners agree that necessary blood levels should be a minimum of 40-60 ng/ml.*

Because Micro D-3 leverages the power of our new breakthrough delivery system (M.E.D.S Technology), you can get up to 10 times more vitamin D into the blood and body when compared to ordinary soft gelatin capsules and other liquid formulations.

**What is M.E.D.S Technology**

M.E.D.S Technology is our new and advanced way to solubilize lipids or lipophilic actives for dietetic applications. Our technology utilizes smart, gentle and environmentally friendly methods, and adheres to a strict philosophy of using only natural and safe materials. The result is an unsurpassed delivery and bioavailability of essential fat soluble vitamins and nutrients such as vitamin D-3.

**M.E.D.S Technology's superior qualities include:**

- All natural ingredients
- Smaller particle sizes (30-60nm)
- No synthetic emulsifiers
- Enhanced nutritional, physiological, and organoleptic profile

**Multiple Studies Validate:**

M.E.D.S Technology can withstand the harsh stomach environment, maintain it's small particle size, cover a very large surface area, significantly increase bioavailability as well as deliver maximum concentrations of a desired nutrient faster and over a longer period of time.

**Vitamin D-3 - Indispensable For Optimal Health**

Vitamin D-3 is really a requisite vitamin for attaining all around good health. Yes, it is good for building strong healthy bones, but its role is so much more dynamic and complex. Without vitamin D, cells can not function properly and our brains could never have fully developed. Vitamin D can protect our brain as well. Vitamin D is a powerful antioxidant, it can increase neuron glutathione, and protect against inflammation.

Studies show that most people, regardless of longitude and seasonal changes, are vitamin D deficient. Low levels of Vitamin D can have consequential adverse effects. The elderly are especially at risk and should have Vitamin D levels checked regularly to ensure the highest possible level is being reached and maintained.\*

**Conclusions**

The role of vitamin D-3 in the body is both holistic and physiological. Often overlooked beyond bone health, vitamin D is essential for reaching and maintaining all around optimal wellness. Optimized Micro D-3 is the most bioavailable form to effectively and safely increase vitamin D-3 levels.\*

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



**Nutrasal**  
**m.e.d.s tech**<sup>®</sup>  
(sub micron emulsion delivery system)

**M.E.D.S Technology is our new revolutionary process to solubilize lipids or lipophilic actives of poor bioavailability for dietetic applications. Our process uses gentle and environmentally friendly methods and adheres to a strict philosophy of using only natural and safe materials.**

**The result is a significant increase in absorption and bioavailability (up to 10 times) of essential fat soluble vitamins and nutrients for optimal effectiveness and better health. \***

### Sub Micron Emulsion Delivery System (M.E.D.S )

M.E.D.S Technology is a new and advanced way to solubilize lipids or lipophilic actives for dietetic applications. Our technology utilizes smart, gentle and environmentally friendly methods. And, what clearly differentiates our M.E.D.S Technology is that it adheres to a strict philosophy of using only natural and safe materials. Nutrasal's primary area of expertise is phospholipids, and one of the most essential components of M.E.D.S superior delivery capability is the use of highly purified phosphatidylcholine (PC). Purified PC is especially important in our process as it is the principle phospholipid responsible for increases in absorption.

Using sophisticated and proprietary techniques as well as special formulations we are able to produce transparent emulsions with lipid concentrations up to 30%. Additionally, our technology is able to produce stable emulsions with very small "micro" particles, which are also a primary determinant of bioavailability. Combined with purified PC, which is well known for its absorption properties, M.E.D.S Technology creates a powerful all natural based carrier and absorption system.

### What separates M.E.D.S Technology from the others?

M.E.D.S Technology is currently the only one that exclusively uses All Natural ingredients. As a result, we are able to produce truly unique product forms. Our technology creates stable, transparent emulsions with a particle or droplet size between 30-60nm.

### M.E.D.S Technology's superior qualities include:

- All natural ingredients
- Smaller particle sizes
- No synthetic emulsifiers
- Enhanced nutritional, physiological, and organoleptic profile

Other technologies require high concentrations of surfactants or solvents like ethanol, propylene glycol, polysorbates, or propanol, etc. and have a limited region of existence that dramatically restricts their use.

**M.E.D.S Tech produces better results than other technologies and does not require any synthetic ingredients.**

### Advantages and Benefits of M.E.D.S Technology Include:

- No preservatives necessary
- No Synthetics
- Hydrophilic (water loving) solutions
- Contains only all natural, physiologically safe and non-GMO ingredients of vegetable origin
- Does not contain alcohol in contrast to other formulations
- Outstanding stability compared to conventional emulsions and mixed micelles
- Consistently small particle sizes below 100nm increases absorption and bioavailability of the active ingredients (up to 10x)

### Multiple Studies Validate Superior Results

#### Laboratory Studies

In lab studies we subjected our micro emulsions to changing pH values. Results showed our oral preparations could remain stable and withstand gastric environments with a low pH between 1-2.

To mimic the environment in the Human Stomach our M.E.D.S CoQ10 was diluted with hydrochloric acid of different molarities and hence different pH values. Changes in particle size and distribution were measured over a 3 hour period to ensure the nutrient would have passed through the stomach. The results were extremely favorable and showed only a very slight increase in particle size during the holdup time of 3 hours at different pH values. No phase separation was observed. Therefore the criteria for improved bioavailability remained valid – small particle sizes and a large surface area distribution.

#### Animal Studies

In animals, our M.E.D.S (solubilized form) CoQ10 was compared with a non-solubilized CoQ10. Our M.E.D.S liquid form administered orally was compared to a purified powdered form administered in capsules and was followed by collecting blood samples at different times.

The results of the plasma concentrations showed that our liquid M.E.D.S formulation, when compared to the powdered CoQ10 at 100% was significantly higher by 68 percent.

**Advanced Lipid Science**  
Delivery | Absorption | Bioavailability

## Clinical Studies

Clinical studies with human subjects using both CoQ10 and Vitamin E demonstrated increased pharmacokinetics in plasma. After a randomized, one day kinetic, single dose cross over design study with 23 healthy volunteers, significant increases in bioavailability of both the CoQ10 and Vitamin E was proven in comparison to the pure product administered in powdered filled capsules.

In both cases our M.E.D.S formulations exhibited a time and plasma concentration advantage over the powdered capsule forms. The powdered CoQ10 capsules showed peak values after 6 hours and a return to near baseline after 14 hours. In addition, total concentration time curves showed a negative profile indicating a very poor absorption. Compared to our M.E.D.S formulation these results are extremely poor. In Contrast, our M.E.D.S CoQ10 began to show significant increases after two hours with a visible two peak pattern obtaining a peak maximum at 6 hours. However, rather than returning to baseline, our formulation stayed well above baseline after 14 hours. Our Vitamin E formulation demonstrated similar results to our CoQ10 and when compared to the pure capsule form our M.E.D.S solution excelled on every metric.

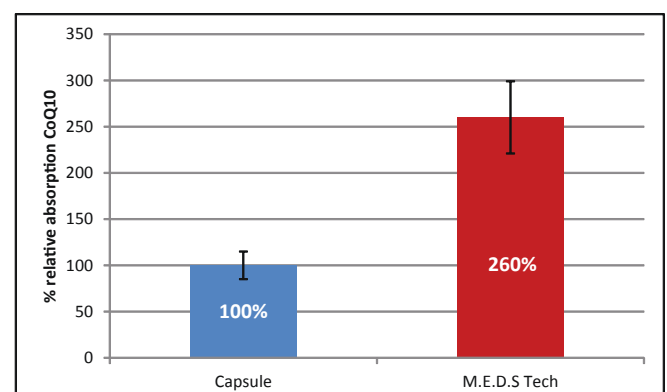
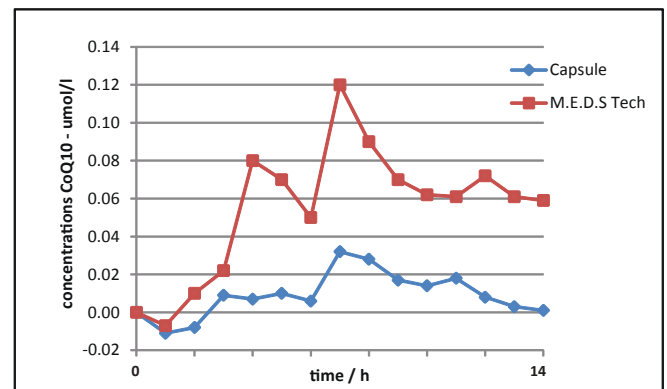
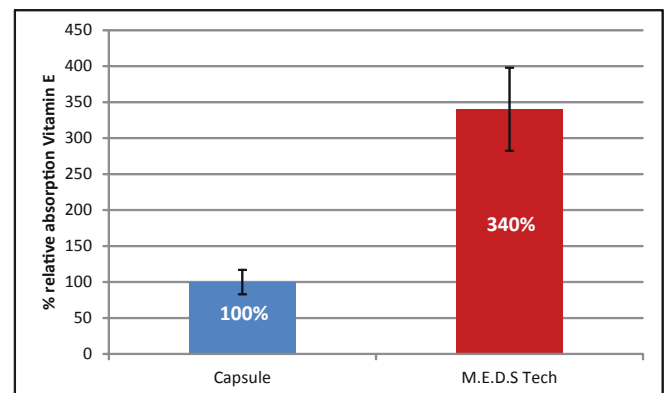
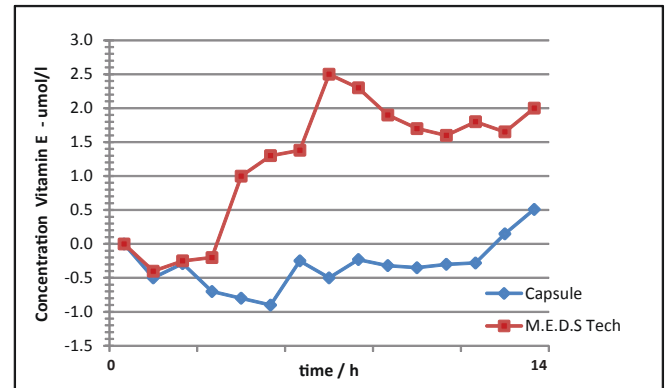
According to the pharmacokinetic parameters for Concentration Maximums and Time Maximums (time at which maximum concentrations are achieved), and Area Under the Curve from 0-14 hours; our M.E.D.S formulations demonstrated a significantly faster and higher increase in comparison to control preparations. In total, the bioavailability of our CoQ10 was 5 times higher and our Vitamin E was 10 times higher when compared to the purified substances in capsules.

## Conclusion

For the first time, our M.E.D.S Tech formulations are able to significantly increase the delivery and performance of fat soluble (lipophilic actives of poor bioavailability) nutrients in an all natural, stable, physiologically safe, and preservative free preparation.

Our laboratory data shows that M.E.D.S formulations are stable when exposed to pH levels similar to human gastric juices. Furthermore, in animal studies, the bioavailability of our formulations was superior to pure powdered forms.

Studies with human subjects verify a very fast response and a significantly higher bioavailability. M.E.D.S formulations are capable of reaching maximum concentrations of a desired nutrient faster and extend over a longer period of time.



***M.E.D.S formulations clearly deliver demonstrable increases in absorption and bioavailability.***