BIOAVAILABILITY OF EMULSIFIED AND MICELLIZED VITAMIN PREPARATIONS

Micellized vitamin preparations have appeared in the holistic market accompanied by claims of greater absorption into plasma than both oily and emulsified forms. However, four factors negate this supposed advantage.
FIRST, extensive basic and clinical research has shown that properly emulsified preparations are equal or greater in effectiveness than micellized preparations in tissue storage, utilization and biological effects.[1]
SECOND, blood levels of vitamins do not necessarily correlate with biological use.[2]
THIRD, rapid increases in blood levels of vitamins from micellization can overload the normal mechanism of vitamin transport and metabolism, resulting in toxicity and tissue damage from non-specific properties of vitamins.[3]
FOURTH, micellized vitamin preparations are two to five times more costly than oily or emulsified products, resulting in the lowest cost-effectiveness of all preparations.

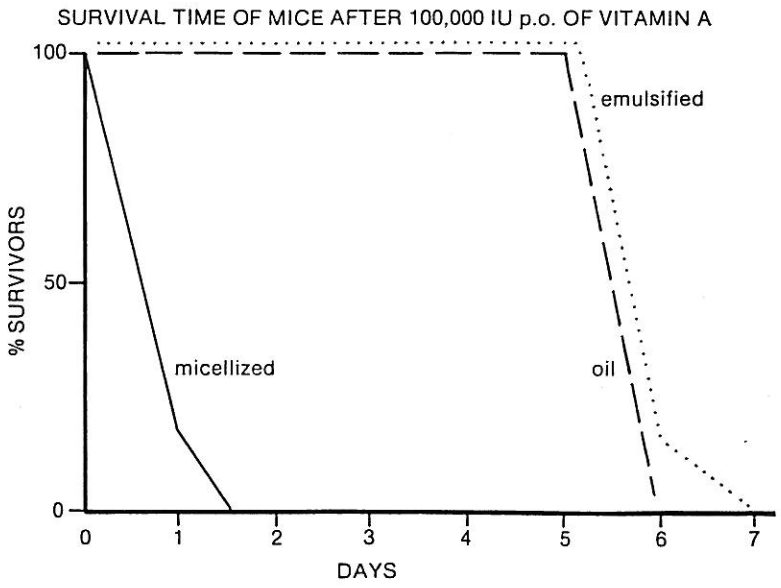
ALL EMULSIONS ARE NOT EQUAL. Some studies have shown increases in absorption and storage for micellized preparations when compared to oil- or emulsified forms.[4] The reason for relatively poor results of these emulsions was the large size of lipid droplets (some visible to the naked eye), reducing effectiveness to little better than oily forms.

Biotics Research emulsions have reproducibly exhibited the smallest particle sizes upon microscopic examination when compared to other emulsions.[5]

Biotics Research vitamin A emulsions were compared to commercial oily and micellized forms for bioavailability and uptake with the classical liver storage assay in mice.[6]

Emulsified vitamin A showed equivalent liver storage with micellized forms at low to moderate doses. At high doses, Biotics Research emulsions exhibited significant increases in vitamin A levels over oily and micellized forms.[5] In a separate experiment, much greater toxicity from micellized vitamin A was seen (Figure 1).[5]

FIGURE 1: (to the right) Survival of mice given an overdose (100,000 I.U.) of vitamin A palmitate orally on day 0.



In conclusion, recent experiments published in peer-reviewed nutrition journals have verified that *Biotics Research emulsified fat-soluble vitamins:*

1) possess the smallest particle sizes of commercial emulsions:
2) have equal or greater uptake and bioavailability than micellized products;
3) show much less toxicity than micellized preparations and
4) are the most cost-effective form of fat-soluble vitamin supplementation.[5]

These results reproduce and confirm the consensus of results from over 40 years of scientific literature.

References:

1 Ellingson, R.C., et al.:
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Transport in Human Vitamin A Toxicity.
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6 Embree, N.D., et al.:
Determination of Vitamin A. Methods of Biochemical Analysis (1957) 4, 43-98.

Journal of nutrition (1986) 116(6), R27

COMPARISON OF VITAMIN A ABSORPTION FROM COMMERCIAL OILY, EMULSIFIED AND MICELLIZED PRODUCTS

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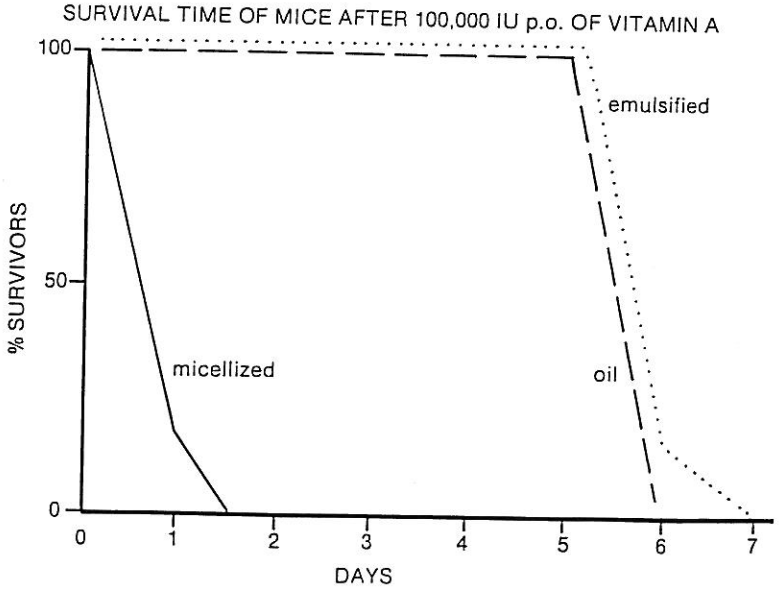
Recent availability of micellized vitamin A preparations in health food stores with accompanying claims of superior absorption over other forms of vitamin A products prompted a study into comparative absorption and toxicities in mice. Emulsified vitamin A preparations showed a large variation of droplet sizes, with the most consistent chosen for assay. Liver storage in ICR male mice from doses of 100, 1000 and 10000 IU vitamin A palmitate per day per mouse from oily, emulsified and micellized forms was determined. Storage at doses of 100 and 100 IU/d was not different, but storage at 10000 IU/d was significantly increased for the emulsified form. A single, acute toxic dose of vitamin A (100000 IU per mouse) in each form was given, and time to lethality noted. All mice treated with micellized vitamin A developed severe diarrhea and died within 24 hours, while mice given oily or emulsified vitamin did not develop diarrhea and died within 48-72 hours. The implications for human toxicity are important, as ingestion of acutely toxic amounts of vitamin A by accidental overdose are more likely from micellized preparations than the other forms.

Biotics Research vitamin A emulsions were compared to commercial oily and micellized forms for bioavailability and uptake with the classical liver storage assay in mice.[6]

Emulsified vitamin A showed equivalent liver storage with micellized forms at low to moderate doses. At high doses. Biotics Research emulsions exhibited significant increases in vitamin A levels over oily and micellized forms.[5] In a separate experiment, much greater toxicity from micellized vitamin A was seen (Figure 1).[5]



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