

EFFECT OF LUTEIN SUPPLEMENATION ON BLOOD CAROTENOIDS AND VITAMINS IN A VARIETY OF MARINE MAMMALS

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Lutein, an oxygenated carotenoid concentrated in the retina in a variety of species, may enhance ocular health (Mares-Perlman et al., 2002). Given the high incidence of ocular pathology in captive marine mammals (Dunn et al., 1996), it was hypothesized that a lutein supplement may protect against some of these conditions. This trial examined the response of different marine mammals to dietary lutein supplementation.

A variety of marine mammals (n=7 beluga whales, 2 hooded seals, 2 grey seals, 8 harbor seals, 5 harp seals, 1 steller sea lion, 8 dolphins, 11 California sea lions, 8 elephant seals, 3 killer whales, 4 walrus, 2 manatee) were fed a lutein supplement at 3.6 mg lutein/kg body weight^{0.75} per day for 15 to 21 days. Blood was collected pre- and post-supplementation, and analyzed by high performance liquid chromatograph for carotenoids, retinol and α -tocopherol. Data were analyzed by ANOVA, and Tukeys LSM was used to compare differences between means, when main effects were significant at $p < 0.05$.

Results demonstrate that supplementation did not affect the levels of blood α -tocopherol or retinol, but did increase blood lutein and zeaxanthin ($p=0.01$, 0.02 , respectively). Species that had increased blood lutein and/or zeaxanthin post-supplementation included beluga whales and dolphins. Despite their herbivorous nature, manatees had no detectable blood carotenoids, nor did walrus or California sea lions.

Preliminary research suggested that in terms of blood lutein, cetaceans are more responsive to dietary lutein supplementation than pinnipeds (Koutsos et al., 2009). These data confirm that observation. Differences within groups of animals (e.g., pinnipeds) may reflect differences in absorption or metabolism of dietary carotenoids or in tissue deposition.

REFERENCES

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