REDUCE THE RISK OF DRY EYE: A NUTRITIONAL OVERVIEW

Dry Eye Disease (DED) is a multifactorial condition characterised by tear film instability and ocular surface inflammation. Diet plays a crucial role in modulating inflammation, supporting tear production, and maintaining ocular surface health. Below is a summary of dietary strategies that may reduce the risk or severity of DED*.

Key nutrition components

Omega-3 Fatty Acids

- **Sources**: Oily fish (salmon), flaxseed, fish oil supplements (e.g., Lacritec).
- **Benefits**: Improve OSDI scores, TBUT, Schirmer's, osmolarity, and corneal staining.
- **Mechanism**: Reduce inflammation; promote epithelial and lacrimal gland cell regeneration.
- **Risks**: Gastric upset, bleeding risk.

Note: No standard dosing guidelines. Ideal omega-6:omega-3 ratio should be ≤4:1.

Mediterranean Diet

- **Includes**: Olive oil, fish, nuts, seeds, vegetables; low in processed foods and saturated fats.
- **Benefits**: Inversely associated with DED; reduces risk of Sjögren's syndrome.
- **Mechanism**: Antioxidant, anti-inflammatory, gut microbiota support.
- **Risk**: Diets high in sugar, saturated fat, and processed foods increase DED risk.

Pre- and Probiotics

- **Sources**: Yoghurt, sauerkraut, miso.
- **Benefits**: May aid tear production.
- **Mechanism**: Improves gut health and microbial diversity.

Note: DED patients often have reduced gut microbiota diversity

Essential vitamins for ocular surface health

Vitamin	Sources	Benefits in DED	Mechanism	Risks of Excess	Notes
B12	Meat, dairy, eggs	Improves OSDI, nerve pain	Corneal nerve repair	GI upset, rare allergy	Often deficient in Sjögren's patients
B1 (Thiamine)	Grains, liver, legumes	Improves symptoms, tear film stability	Analgesic	Low risk	-
D	Fish, eggs, UV	Improves tear osmolarity & stability	Antiox/anti-inflam; Immune modulation	Hypercalcemia, falls	Deficiency common in Sjögren's
A	Liver, fish	Enhances goblet cells, corneal epithelialisation	Mucosal healing, antioxidant	Toxicity, birth defects	Avoid excess in pregnancy
C & E	C: Citrus, broccoli E: seeds	Tear volume & stability, improves symptoms	Antioxidants	C: kidney stones, E: bleeding risk	-

*References available on request.

Trace elements and other supportive nutrients

Nutrient	Sources	Role in DED	Mechanism	Risks of Excess
Calcium	Dairy, fish bones	Stabilises tear film	Goblet cell function	Kidney stones, GI issues
Magnesium	Nuts, beans, seafood	Improves tear quality	Anti-inflammatory	Diarrhoea, toxicity in excess
Zinc	Oysters, wheat germ, nuts	Ocular surface cell repair	Anti-inflammatory	GI symptoms, anosmia
Selenium	Brazil nuts, seafood	Protects ocular surface	Antioxidant	Skin/nerve lesions, GI symptoms, hair loss
Water	-	Improves tear osmolarity and stability	Maintains hydration	-
Curcumin	Turmeric	May improve tear volume, TBUT	Anti-inflam/antiox	None reported

Nutrients and habits that increase DED risk

Vitamin B3 (Niacin)

- **Sources**: Meat, fish, grains.
- **Impact**: Can cause ocular inflammation, SPK, eyelid oedema.
- **Notes**: High doses linked to cystoid macular oedema (CMO).

Abnormal Lipid Profiles

- **Impact**: Associated with increased Meibomian Gland Dysfunction (MGD).
- **Mechanism**: High LDL/triglycerides promote gland obstruction and inflammation.

Alcohol

- **Impact**: Reduces tear volume, disrupts tear film (increases osmolarity and reduces TBUT).
- **Mechanism**: Ethanol alters tear composition; potential pro-inflammatory effect.

No direct link to DED

Coffee No clear association with frequency of coffee consumption and DED risk. May contribute to dehydration and thus tear volume.

Copper No direct role in DED, but copper-selenium nanoparticles show therapeutic potential in oxidative damage models.

Summary

Following a diet rich in **anti-inflammatory and antioxidant** nutrients—such as **omega-3s, vitamin D, A, C, E, magnesium, zinc, and selenium** as well as **B12** and **B1**—while avoiding pro-inflammatory foods (vitamin B3), excessive alcohol and maintaining a normal lipid profile, can support eye health and reduce the burden of DED. The Mediterranean diet, hydration, and gut health also play important roles. Caution is advised with high-dose supplementation due to potential toxicity.

Disclaimer: This guide does not provide medical advice. It is intended for educational purposes only. It is not a substitute for professional medical advice, diagnosis or treatment