Module 2: Concentrated Phospholipid Krill Oil and Cognition

Lyso-PC–DHA transport, phosphatidylcholine, choline, and astaxanthin neuroprotection

Speaker Notes Summary and Self-Assessment Quiz

Key Teaching Points

• Lyso-PC–DHA is the form of DHA most efficiently transported across the blood–brain barrier via the Mfsd2a transporter on brain endothelial cells.

• Krill oil supplies DHA esterified in phosphatidylcholine. Gut (PLA2) and liver can convert this toward the lyso form; the complete sequence has not been fully demonstrated in dogs.

• Phosphatidylcholine serves dual roles: it is the principal structural phospholipid of neuronal membranes and a source of choline for acetylcholine synthesis.

• Astaxanthin crosses the BBB (rodent data) and has proposed neuroprotective effects on microglia, mitochondria, and oxidative damage. Canine cognitive benefit is not established by the cited evidence.

• Cognition-range EPA/DHA doses in published trials vary widely (roughly 7–94.5 mg/kg). Start conservatively. Strongest trials used multinutrient diets.

• Monitor with the Omega-3 Index (OmegaQuant; dogs only). Allow 8–12 weeks before judging effect. Stay under the NRC 370 mg/kg^0.75/day safe upper limit for total EPA+DHA (dogs only; no feline limit).

• Always rule out pain, sensory loss, and metabolic differentials before attributing signs solely to age-related cognitive change.

Self-Assessment Quiz

Select the best answer. Answers appear at the end.

1. The transporter primarily responsible for efficient lyso-PC–DHA uptake across the blood–brain barrier is:

A. CD36

B. Mfsd2a

C. FABP5

D. GLUT1

2. Phosphatidylcholine from concentrated krill oil contributes to cognitive support by:

A. Supplying only EPA

B. Serving as both membrane phospholipid and a choline source for acetylcholine

C. Acting solely as an antioxidant

D. Replacing the need for dietary DHA

3. The NRC 2006 safe upper limit of 370 mg/kg^0.75/day for combined EPA+DHA applies to:

A. Dogs and cats

B. Dogs only (no feline limit established)

C. Cats only

D. Neither species

4. Astaxanthin neuroprotection data discussed in this module are primarily from:

A. Large canine randomized controlled trials

B. Rodent models and in-vitro studies (interpret species carefully)

C. Human clinical trials only

D. Feline-specific RCTs

5. When starting concentrated phospholipid krill oil for senior cognitive support, the recommended approach is to:

A. Immediately use the highest published study dose

B. Start in lower published ranges, account for diet omega-3s, and monitor with Omega-3 Index (dogs only)

C. Rely on ALA conversion alone

D. Omit monitoring because the product is natural

Answer Key

1. B
2. B
3. B
4. B
5. B

These materials are for educational purposes only and do not constitute veterinary medical advice for any specific patient. Product selection, dosing, and monitoring decisions must be made by a licensed veterinarian.