

PETFOOD FORUM ASIA



Stability of Marine Microalgae Oil During Extrusion, Retort, and Long-Term Storage

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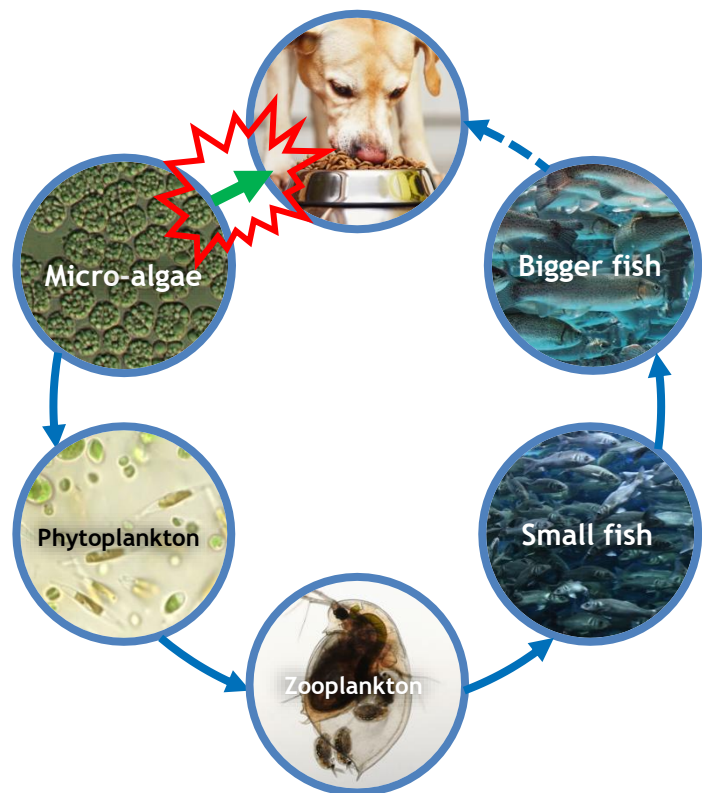
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Health Benefits of DHA & EPA

- ✓ Essential nutrients for growth & reproduction of dogs and cats (AAFCO, FEDIAF)
- ✓ Critical for brain and vision development and health
- ✓ Supporting joint health
- ✓ Supporting renal health
- ✓ Supporting heart health
- ✓ Modulating immune function
- ✓ Supporting skin and hair health
- ✓ Supporting optimal cognition
- ✓ ...



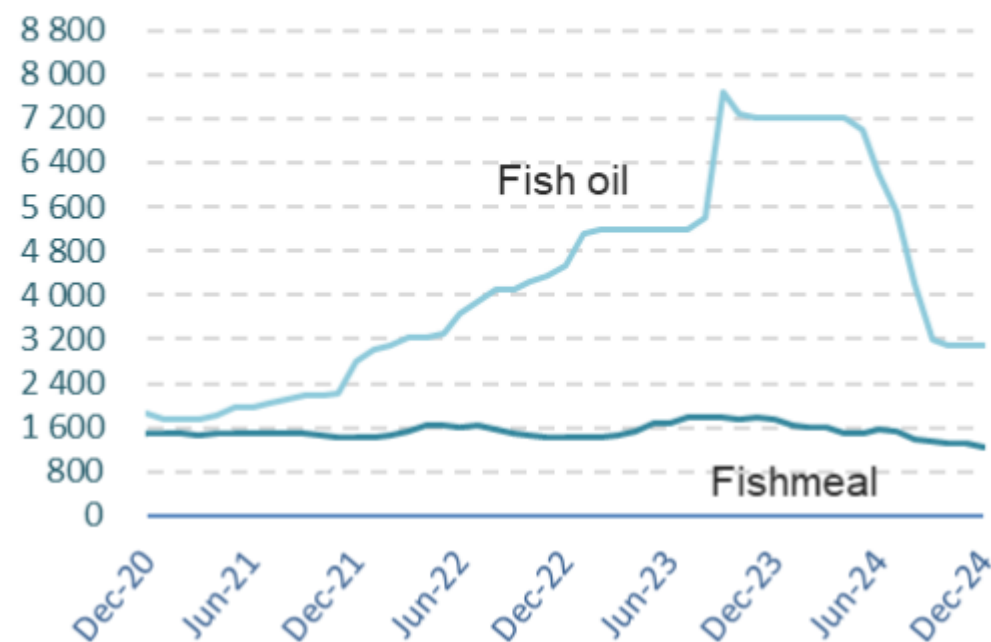
Fish Oil is a Major Source of DHA & EPA



Prices

Fish oil and fishmeal: Peru fob

USD/tonne



Source: Author's own elaboration based on the data from the IFFO, 2025.
The Marine Ingredients Organisation. [Cited 1 July 2025]. www.iffco.com

A Sustainable Solution: Marine Microalgae Oil (MMO)



Objectives of the Studies

- Stability of MMO during **pet food processes**
 - ❖ Extrusion
 - ❖ Retort
 - ❖ HPP + Freeze Drying
- Stability of MMO during **long-term storage**
 - ❖ Dry **dog** and cat food, 24 months, **25 °C, 60% RH** and **40 °C, 75% RH**
 - ❖ Wet dog and **cat** food, 36 months, **25 °C, 60% RH** and **40 °C, 75% RH**

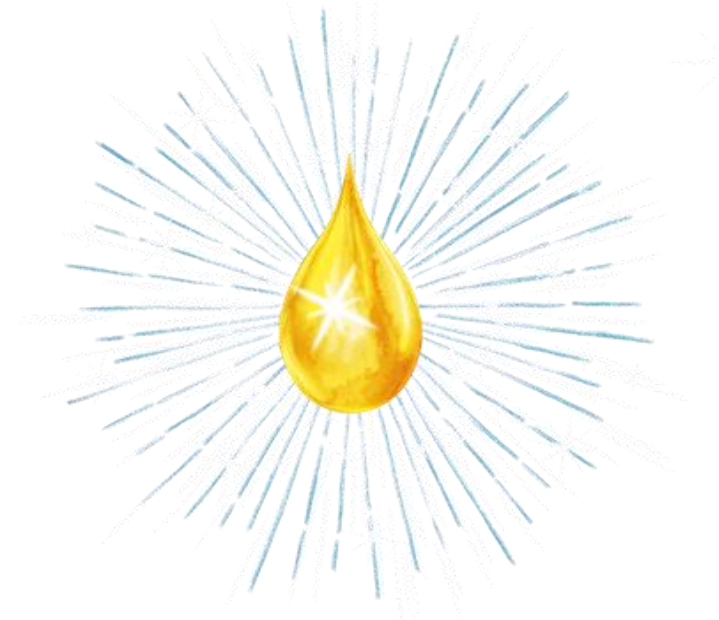
Test Material

Marine Microalgae Oil (Veramaris® Pets Algal Oil EPA + DHA, Veramaris, Delft, The Netherlands)

Lot #: VY00014962, VY00015240, VY00015572

Specifications

- DHA + EPA : min. 500 mg/g
- EPA : min. 100 mg/g
- Peroxide Value: max. 5.0 meq/kg
- Anisidine value: max 25
- TOTOX: max. 35
- Free fatty acid: max. 5 %
- Moisture: max. 0.10 %
- Dioxins: max. 0.75 ng/kg



DHA & EPA in MMO are Stable During Extrusion of a Dry Cat Food

Major ingredients:

chicken by-product meal, corn, dried egg, brewer's rice, chicken fat, milo, wheat, natural flavor, corn gluten meal, beet pulp, dicalcium phosphate, potassium chloride, salt, vitamin premix, calcium carbonate, mineral premix, choline chloride, etc.

Process conditions:

Feed rate: 172 kg/h

Preconditioner discharge temperature: 98 °C

Die temperature: 176 °C

Cone head pressure: 185 psig

Drying: 127 °C, 23 min.

Package: metalized 5 mil PE bags

DHA and EPA retention in a dry cat food during extrusion

Lot number	VY00014962		VY00015240		VY00015572	
Fatty Acids	DHA	EPA	DHA	EPA	DHA	EPA
Exit preconditioner*, %	0.70	0.18	0.57	0.15	0.59	0.17
Finished product**, %	0.63	0.16	0.58	0.16	0.58	0.17
Retention, %	90	89	102	107	98	100

Retention: Finished product/Exit preconditioner x 100

*: Average of 2 samples

**: Average of 8 samples



DHA & EPA in MMO are Stable During Retort of a Wet Dog Food

Major ingredients:

Mechanically deboned chicken, water, pork meat by-product, chicken liver, brewer's rice, vitamin and mineral premix, guar gum, carrageenan, potassium chloride, nature flavors, salt, and choline chloride

Process conditions:

Package: 369 g metal can

Temperature: 121 °C

Duration: 75 min.



DHA and EPA retention in a wet dog food during retort

Lot number	VY00014962		VY00015240		VY00015572	
Fatty Acids	DHA	EPA	DHA	EPA	DHA	EPA
Before retort*, %	0.68	0.17	0.55	0.17	0.50	0.21
After retort**, %	0.71	0.21	0.67	0.21	0.63	0.21
Retention, %	104	125	123	124	127	100

Retention: After retort/Before retort x 100

*: A composite of three samples

**: Average of 10 samples

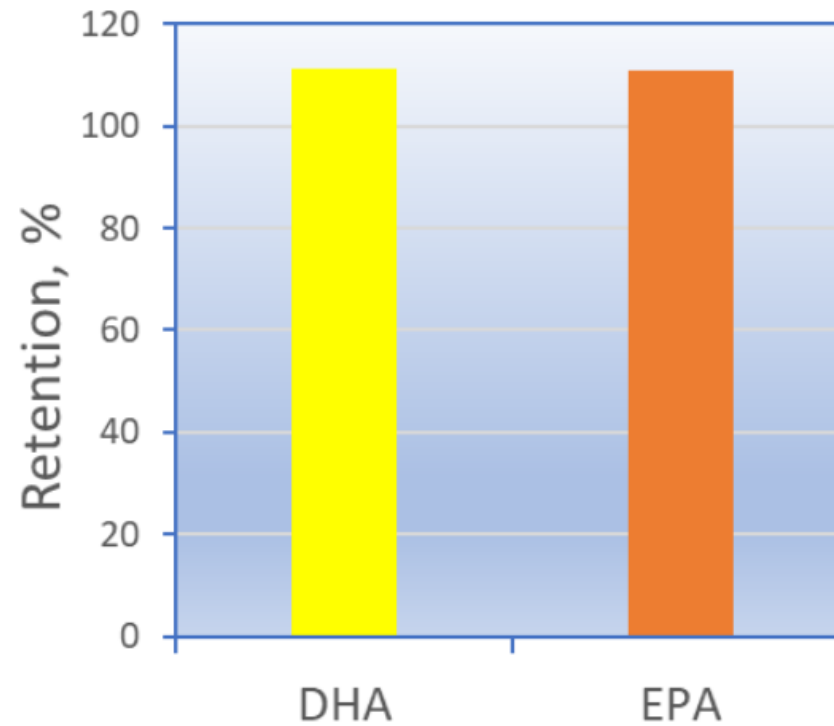


DHA & EPA in MMO are Stable During HPP and Freeze Drying

HPP



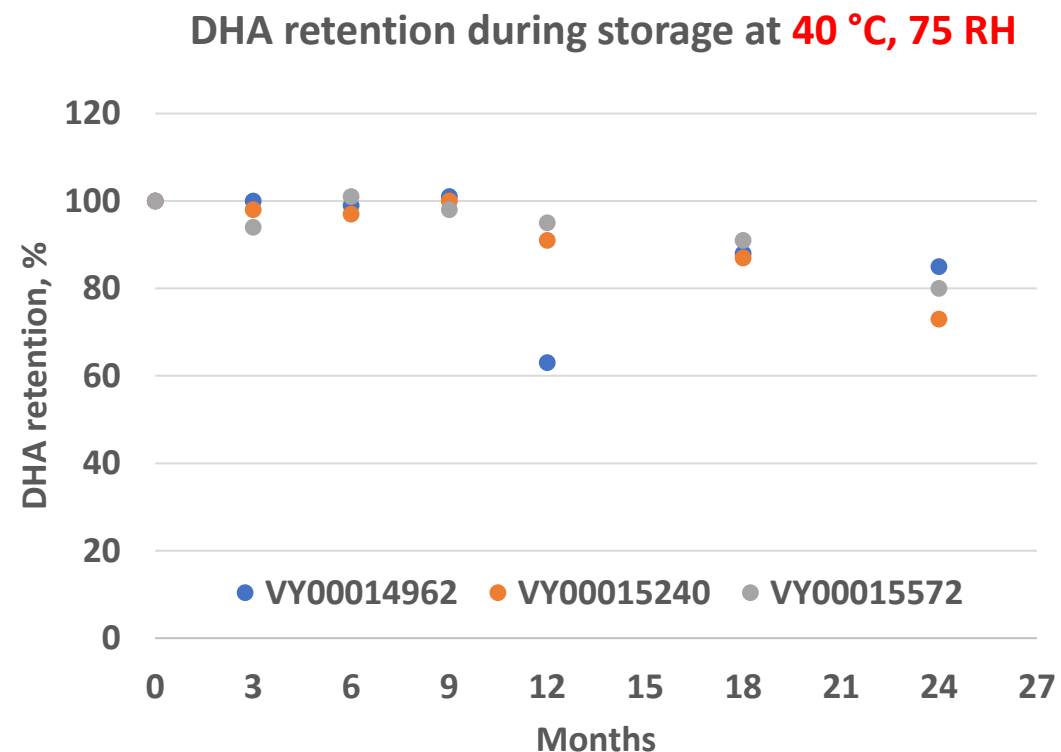
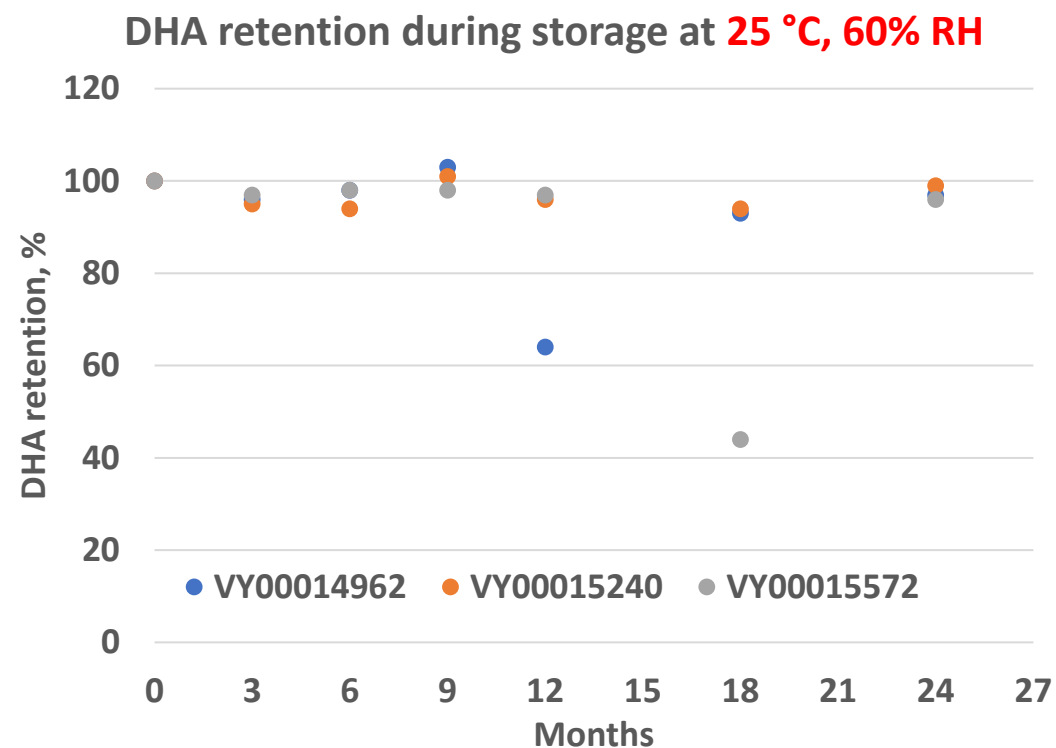
DHA & EPA Retention



Freeze Drying

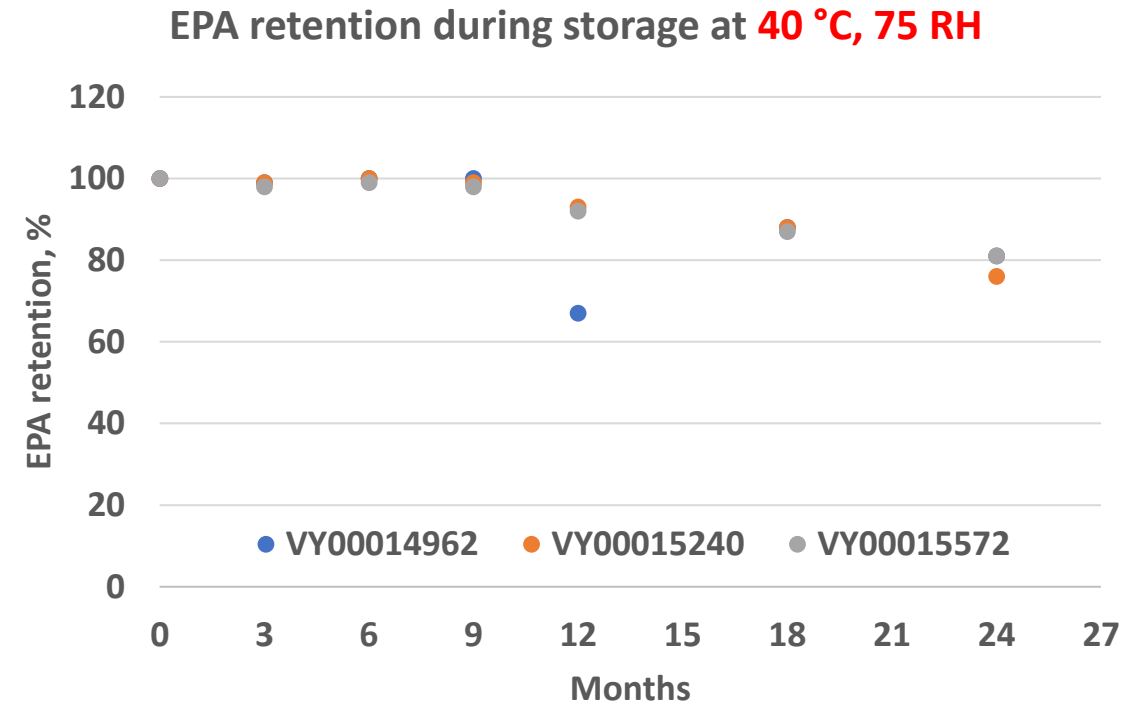
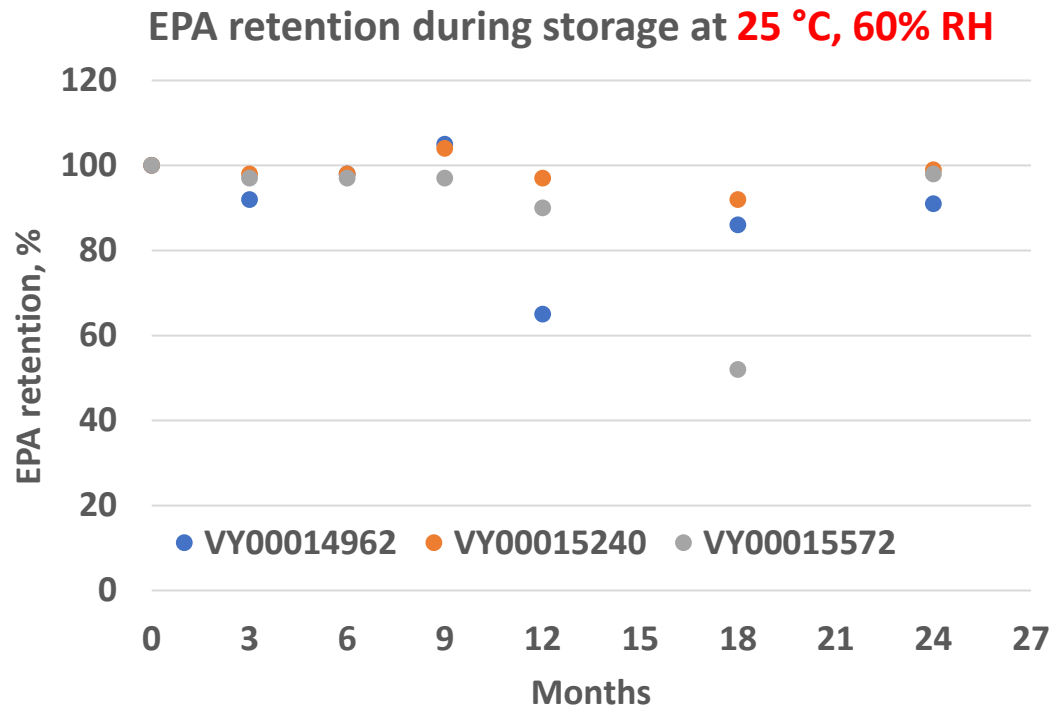


DHA in MMO is Stable in a Dry Dog Food During 24 Months of Storage



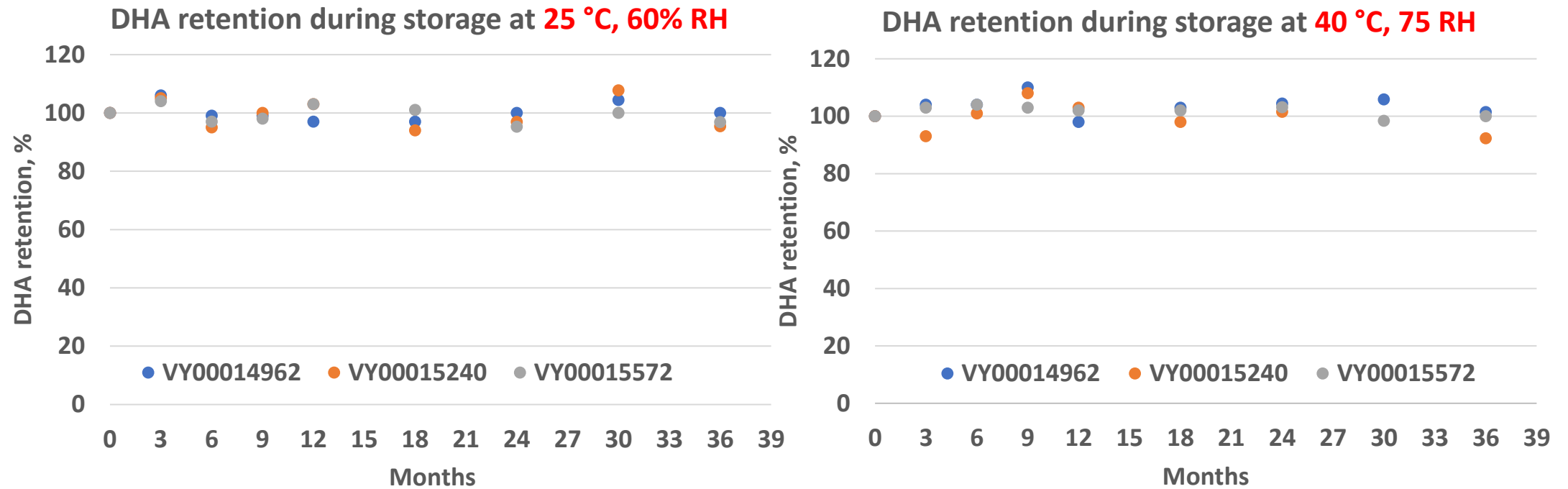
PV < 2.0 meq/kg fat throughout the study

EPA in MMO is Stable in a Dry Dog Food During 24 Months of Storage



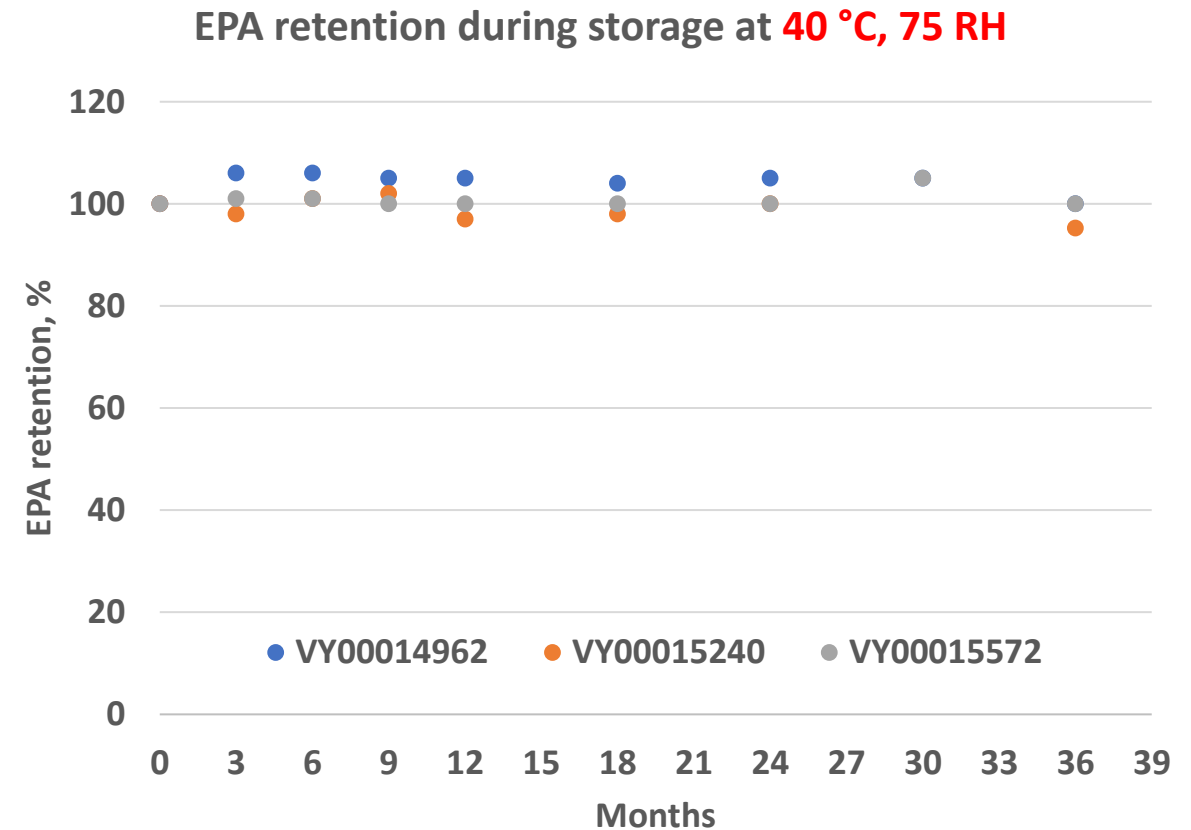
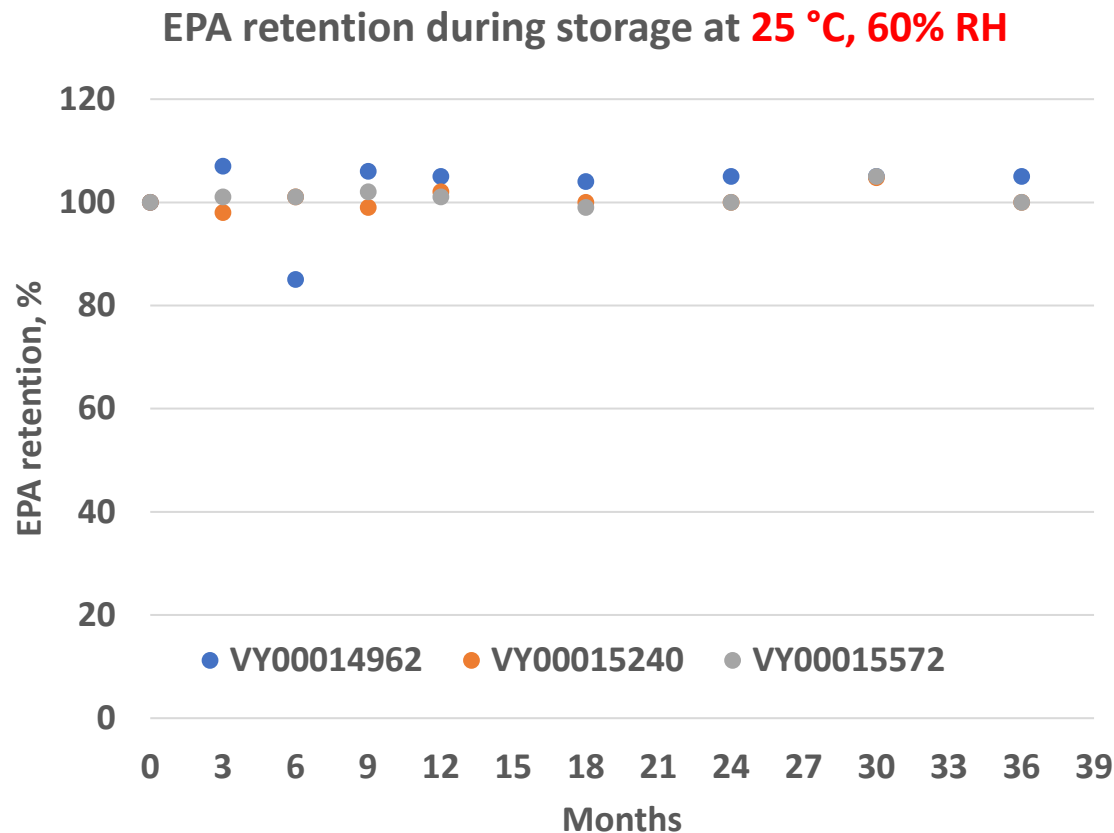
PV < 2.0 meq/kg fat throughout the study

DHA in MMO Is Stable in a Wet Cat Food During 36 Months of Storage



PV < 2.0 meq/kg fat throughout the study

EPA in MMO Is Stable in a Wet Cat Food During 36 Months of Storage



PV < 2.0 meq/kg fat throughout the study

Summary



Marine microalgae oil is:

- ✓ Stable in a typical dry dog or cat food during expanding **extrusion**
- ✓ Stable in a typical wet dog or cat food during **retort**
- ✓ Stable in a typical pet food during **HPP and freeze drying**
- ✓ Stable in a typical dry dog or cat food during **24 months** of long-term storage
- ✓ Stable in a typical wet dog or cat food during **36 months** of long-term storage

MMO Provides Excellent Opportunities for Innovations in Pet Food & Supplement



High Potency

64% total Omega-3,
58% EPA + DHA, 2% ARA.
Frees space in formulas



Fish Free

Fish free cultivation allows for a waste free
and sustainable process



Natural

Natural marine algae compliant with
AAFCO natural definition
Non GM.



Palatable

Proven palatability & consistency over
fish oil in dog & cat food applications*



Safe

Cultivated on land in a controlled
environment. Free from ocean-borne
contaminants* (e.g. heavy metals, dioxins).
Certified MSC/ASC



Consistent

Produced using a 100%
controlled cultivation process. Consistent
application stability.

Potency (EPA/DHA)
Palatability
Stability
Consistency
Supply assurance
Safety <i>no ocean born contaminant: PCB, dioxin, heavy metal</i>
Allergen free / Biological hazards free
Application flexibility <i>To be used on both coating & inclusion</i>
Innovative claims
Non-GMO
Natural
Regulatory <i>approved for cats and dogs all life stages</i>
Sustainability

Thank You

We bring progress to life™

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