

Molecular Distillation or Oil Refining?

The Facts on Fish Oil

Fish oils are commonly purified through molecular distillation or oil refining. Both methods have advantages and disadvantages, and in some cases, are combined to generate oil with the desired qualities. To guarantee you receive the fish oil that best meets your needs, Bioriginal offers fish oils that have been purified through either method, as well as a combination of the two. The end application should determine the purification method. Let us help you make your choice.

Molecular Distillation

Molecular Distillation: a distillation process primarily used to concentrate omega-3 fatty acids (EPA and DHA) in fish oil, and remove contaminants.

Molecular distillation involves:

- Converting the raw oil into an ethyl ester.
- Separating the ethyl ester fatty acids from contaminants in a vacuum system to ensure temperatures are well below the oil's normal boiling point.
- Utilizing molecular weights to isolate the ethyl ester fatty acids, leaving unwanted contaminants behind.
- Recovering these now distilled fatty acids into a final product with extremely low levels of contaminants.



Molecular Distillation Advantages

- **Stability:** the vacuum allows oils to be processed at minimal temperatures, reducing the risk of oxidative damage.
- **Purity:** separating the oil's components by weight allows contaminants to be reduced far below industry standards.
- **Concentration:** weight grouping allows the processor to concentrate fatty acids.

Molecular Distillation Disadvantages

- **Cost:** the cost for this complicated technology is relatively high.
- **Natural Form:** the starting natural triglyceride form is lost in the process.

Oil Refining

Oil Refining: a purification process utilized to remove contaminants, but does not offer concentration options. Oil refining involves:

- **Neutralization:** free fatty acids are removed through neutralization with a base.
- **Bleaching:** an absorbent such as bleaching earth or active carbon is used to reduce color pigments and contaminants to levels which are within acceptable limits.
- **Deodorization:** a combination of steam and vacuum is employed to remove volatile components responsible for the oil's odor and flavor.

* Deodorization is otherwise referred to as steam distillation

Oil Refining Advantages

- **Taste & Color:** neutralization and bleaching reduce flavor and color.
- **Cost:** the cost for this more conventional purification is relatively less expensive.
- **Natural Oils:** the starting natural triglyceride form is maintained throughout the process.

Oil Refining Disadvantages

- **Concentration:** fatty acid content is dependent on the initial raw material. Concentrations are not possible.
- **Purity:** contaminant removal is less efficient than weight collection, but still meets industry standards.
- **Stability:** oil refining involves higher temperatures than molecular distillation, therefore there is increased risk for oxidative damage.

It's Your Choice

Bioriginal offers molecularly distilled and refined oils, as well as oils purified through a combination of both methods to guarantee we meet our customers' needs.

Process/ Feature	Molecularly Distilled	Molecularly Distilled & Refined	Refined
Stability	Superior	Superior	Acceptable
Purity	Superior	Superior	Acceptable
Concentration	Optional	Optional	No
Natural Triglyceride	No	No	Yes
Taste & Odor	Acceptable	Superior	Superior
Color	Acceptable	Superior	Superior
Processing Costs	Medium	High	Low

© Bioriginal Food & Science Corp.
102 Melville Street, Saskatoon, Saskatchewan, Canada S7J 0R1
Telephone: (306) 975-1166 • Facsimile: (306) 242-3829
Website: www.bioriginal.com • Email: business@bioriginal.com

© Bioriginal Europe/Asia
Bosland 40, 3258 AC Den Bommel, The Netherlands
Telephone: +31 (0) 187 618 020 • Facsimile: +31 (0) 187 618 040
Website: www.bioriginal.nl • Email: info@bioriginal.nl

Disclaimer: This information is provided in good faith as educational material. It is the customer's responsibility to check the suitability of the material under FDA (DSHEA), Health Canada, and/or any other rules regarding the use of this material. Bioriginal is not responsible for compliance with various rules regarding the use of this literature as promotional material.