WHAT IS CLAIMED:

1. A microbial oil comprising a triglyceride fraction of at least 70% by weight, wherein the docosahexaenoic acid content of the triglyceride fraction is at least 50% by weight, and wherein the docosapentaenoic acid n-6 content of the triglyceride fraction is from 0.5% by weight to 6% by weight, and wherein the oil comprises 5% by weight or less of heptadecanoic acid.

2. The microbial oil of claim 1, further comprising an arachidonic acid content of the triglyceride fraction of 1.5% or less by weight.

3. A microbial oil comprising a triglyceride fraction of at least 70% by weight, wherein the docosahexaenoic acid content of the triglyceride fraction is at least 40% by weight, wherein the docosapentaenoic acid n-6 content of the triglyceride fraction is from at least 0.5% by weight to 6% by weight, and wherein the ratio of docosahexaenoic acid to docosapentaenoic acid n-6 is greater than 6:1, and wherein the oil comprises 5% by weight or less of heptadecanoic acid.

4. A microbial oil comprising a triglyceride fraction of at least 70% by weight, wherein the docosahexaenoic acid content of the triglyceride fraction is at least 60% by weight, and wherein the oil comprises 5% by weight or less of heptadecanoic acid.

5. The microbial oil of any one of claims 1 to 4, wherein at least 20% of the triglycerides in the triglyceride fraction contain docosahexaenoic acid at two positions in the triglyceride selected from any two of the *sn*-1, *sn*-2, and *sn*-3 positions.

6. The microbial oil of any one of claims 1 to 4, wherein at least 5% of the triglycerides in the triglyceride fraction contain docosahexaenoic acid at all three of the *sn*-1, *sn*-2, and *sn*-3 positions in the triglyceride.

7. A food product, cosmetic, or pharmaceutical composition for animals or humans, comprising the microbial oil of any one of claims 1 to 6.

8. The food product of claim 7, wherein the food product is an infant formula.

9. The food product of claim 8, wherein the infant formula is suitable for premature infants.

10. The food product of claim 7, wherein the food product is milk, a beverage, a therapeutic drink, a nutritional drink, or a combination thereof.

11. The food product of claim 7, wherein the food product is an additive for animal or human food.

12. The food product of claim 7, wherein the food product is a nutritional supplement.

13. The food product of claim 7, wherein the food product is an animal feed.

14. The animal feed of claim 13, wherein the animal feed is an aquaculture feed.

15. The animal feed of claim 13, wherein the animal feed is a domestic animal feed, a zoological animal feed, a work animal feed, a livestock feed, or a combination thereof.

16. Use of the ~~isolated microorganism, biomass, or~~ microbial oil of any one of claims 1 to 6, or mixtures thereof, for the manufacture of a medicament for the treatment of inflammation ~~or a condition related thereto~~.

17. The ~~isolated microorganism, biomass, or~~ microbial oil of any one of claims 1 to 6, or mixtures thereof, for use in the treatment of inflammation ~~or a condition related thereto~~.

18. The microbial oil of any one of claims 1 to 6, wherein said oil is a crude oil.

19. The microbial oil of any one of claims 1 to 6, 18, wherein said oil is a refined oil.

20. The microbial oil of any one of claims 1 to 6, 18 to 19, wherein said oil is a diluted microbial oil.

21. The microbial oil of anyone of claims 1 to 6, 18 to 19, wherein said oil is an enriched oil.

22. An infant formula comprising the microbial oil of any one of claims 1 to 6, 18 to 21, or mixtures thereof in combination with a physically refined oil derived from a arachidonic acid-producing microorganism.

23. The infant formula according to claim 22, wherein the arachidonic acid-producing microorganism is selected from *Mortierella alpina* and *Mortierella* sect. *schmuckeri*.

24. An infant formula supplemented with a microbial oil of any one of claims 1 to 6, 18 to 21, or mixtures thereof in combination with an oil rich in arachidonic acid.