Supplementary

Table S1.Ingredients (g/kg diet) of experimental diets in rat feeding trial

|  |  |  |  |
| --- | --- | --- | --- |
|  Ingredients (g/kg) | PO | PO/FO (1:1) | FO |
| Soybean Oil\* | 50 | 50 | 50 |
| Sandeel Oil† | - | 35 | 70 |
| Camelina Oil‡ | 70 | 35 | - |
| Casein protein§ | 232 | 232 | 232 |
| Corn starch║ | 446 | 446 | 446 |
| Sucrose║ | 90 | 90 | 90 |
| Cellulose║ | 50 | 50 | 50 |
| Tert-butylhydroquinone║ | 0.014 | 0.014 | 0.014 |
| Mineral Mix (AIN-93MX) ║ | 35 | 35 | 35 |
| Vitamin Mix (AIN-93VX) ║ | 10 | 10 | 10 |
| L-Methionine║ | 1.6 | 1.6 | 1.6 |
| L-Cystine║ | 3 | 3 | 3 |
| Choline Bitartrate¶  | 2.5 | 2.5 | 2.5 |
| Growth and Maintenance Supplement\*\* | 10 | 10 | 10 |

PO, plant oil; PO/FO; plant oil/fish oil; FO, fish oil.

\* Denofa AS (Norway).

† Vedde AS (Norway).

‡ Norsk Matraps at Askim Frukt og Bærpresseri (Norway).

§ Sigma-Aldrich (USA), contains 86.25 % crude protein

║ Dyets Inc. (USA).

¶ Dyets Inc. (USA), contains 41.1% choline.

\*\* Dyets Inc. (USA), contains 2.5 g vitamin B12, 2.5g vitamin K1, and 995g sucrose per kg.

Table S2. Fatty acid composition (% of total fatty acids) of diets in rat feeding trial

|  |  |  |  |
| --- | --- | --- | --- |
| Fatty acid %  | PO | PO/FO (1:1)  | FO |
| ∑SFA\* | 12.24 | 15.59 | 19.27 |
| ∑MUFA† | 25.58 | 29.07 | 32.85 |
| ∑PUFA‡ | 59.45 | 51.62 | 43.1 |
| EPA  | 0 | 2.90 | 5.99 |
| DHA | 0 | 2.53 | 5.26 |
| ∑*n-3* VLC-PUFA | 0 | 0.02 | 0.04 |

PO, plant oil; PO/FO; plant oil/fish oil; FO, fish oil; SFA, saturated fatty acids; MUFA, monounsaturated fatty acids; PUFA, polyunsaturated fatty acids

\* Includes 14:0, 16.0, 18:0, 20:0;

† Includes 16:1 *n*-7, 18:1 *n*-9, 20:1 *n*-9, 22:1 *n*-11, 22:1 *n*-9;

‡ Includes 18:2 *n*-6, 18:3 *n*-3, 18:4 *n*-3, 20:5 *n*-3, 22:5 *n*-3, 22:6 *n*-3

Table S3. Ingredients (% included in diet) in feed of experimental diets in salmon feeding trial Groups are named according to percentage of VLC-Concentrate (VLC-Conc) included in the feed

|  |  |
| --- | --- |
|  | VLC-Conc (%) |
| Ingredients (%) | 0 | 2.5 | 5.0 | 7.5 | 10 |
|  | % | % | % | % | % |
| Fish meal \* | 50.00 | 50.00 | 50.00 | 50.00 | 50.00 |
| Wheat †  | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 |
| Wheat gluten  | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 |
| Soy meal concentrate ‡ | 10.00 | 10.00 | 10.00 | 10.00 | 10.00 |
| Choline chloride § | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 |
| Soy lecithin ║ |  |  |  |  |  |
| Fish oil \* | 13.54 | 10.15 | 6.76 | 3.38 | 0.00 |
| Canola oil ¶ | 0 | 1.25 | 2.50 | 3.75 | 4.99 |
| Vitamin-mix  | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Mono sodium phosphate  | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Asta 10%  | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| Mineralmix | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 |
| EPA (EPAX 6015 TGN) \*\* | 0.10 | 0.07 | 0.05 | 0.02 | 0.00 |
| DHA (EPAX 0460 TGN) \*\* | 1.36 | 1.02 | 0,68 | 0.34 | 0.00 |
| VLC-Conc \*\* | 0 | 2.5 | 5 | 7,5 | 10 |

\* Vedde AS (Norway).

† Norgesmøllene AS (Norway).

‡ Agrokorn (Germany).

§ Vilomix (Norway).

║ Denofa (Norway).

¶ Nuseed US (Australia).

\*\* Epax Norway AS (Norway).

Table S4. Fatty acid composition (% of total fatty acids) of diets used in salmon feeding trial. Groups are named according to percentage of VLC-Concentrate (VLC-Conc) included in the feed

|  |  |
| --- | --- |
|  | VLC-Conc (%) |
| Fatty acid % | 0 | 2.5 | 5 | 7.5 | 10 |
| ∑SFA \* | 18.8 | 16.1 | 13.0 | 10.3 | 7.7 |
| ∑MUFA † | 42.5 | 39.5 | 35.2 | 32.3 | 28.3 |
| ∑ *n-6* PUFA ‡ | 4.2 | 5.1 | 6.0 | 7.1 | 7.8 |
| ∑ *n-3* PUFA § | 23.7 | 24.4 | 24.6 | 25.5 | 25.5 |
| ∑PUFA | 28.4 | 30.0 | 31.1 | 32.9 | 33.6 |
| EPA | 6.5 | 6.6 | 6.4 | 6.5 | 6.3 |
| DHA | 11.8 | 11.9 | 11.9 | 12.0 | 11.9 |
| ∑*n-3* VLC-PUFA | 0.1 | 2.6 | 5.0 | 7.5 | 10.1 |

SFA, saturated fatty acids; MUFA, monounsaturated fatty acids; PUFA, polyunsaturated fatty acids; UI, unidentified

\* Includes 14:0, 16.0, 18:0, 20:0, 22:0;

† Includes 16:1 *n*-7, 18:1 *n*-5+*n*-7+*n*-9, 20:1 *n*-7+*n*-9, 22:1 *n*-7+*n*-9+*n*-11, 22:1 *n*-9, 24:1 *n*-9;

‡ Includes 18:2 *n*-6, 18:3 *n*-6, 20:2 *n*-6, 20:3 *n*-6, 20:4 *n*-6, 22:4 *n*-6;

§ Includes 18:3 *n*-3, 18:4 *n*-3, 20:3 *n*-3, 20:4 *n*-3, 20:5 *n*-3, 21:5 *n*-3, 22:5 *n*-3, 22:6 *n*-3

Table S5. Ingredients (% included in diet) in feed of experimental diets in mouse feeding trial

|  |  |  |  |
| --- | --- | --- | --- |
| Ingredients (%) | Ctr-PO | Ctr-FO | VLC-Conc |
| Corn Starch  | 37.25 | 37.25 | 37.25 |
| Sucrose | 20.00 | 20.00 | 20.00 |
| Casein – Vitamin tested | 18.96 | 18.96 | 18.96 |
| Lard | 5.00 | 5.00 | 5.00 |
| Soy oil \* | 5.00 | 0.00 | 0.00 |
| Fish oil † | 0.00 | 5.00 | 0.00 |
| VLC-Conc ‡ | 0.00 | 0.00 | 5.00 |
| Powdered Cellulose | 4.74 | 4.74 | 4.74 |
| Maltodextrin | 3.32 | 3.32 | 3.32 |
| Potassium Citrate, Tribasic Monohydrate | 1.56 | 1.56 | 1.56 |
| Calcium Phosphate | 1.23 | 1.23 | 1.23 |
| DIO Mineral Mix | 0.95 | 0.95 | 0.95 |
| AIN-76A Vitamin Mix | 0.95 | 0.95 | 0.95 |
| Calcium Carbonate | 0.52 | 0.52 | 0.52 |
| L-Cystine | 0.28 | 0.28 | 0.28 |
| Choline Bitrate | 0.19 | 0.19 | 0.19 |
| FD&C Yellow No. 5 | 0.05 | 0.05 | 0.05 |

Ctr-PO, control plant oil; Ctr-FO, control fish oil; VLC-Conc, very-long-chain concentrate.

\* Standard soy oil from grocery store

† Fish oil concentrate based on anchovies, mix of conventional fish oil concentrates (Epax Norway AS, Norway)

‡ VLC-PUFA concentrate based on anchovies (Epax Norway AS, Norway)

Table S6. Fatty acid composition (% of fat) of diets in mouse feeding trial

|  |  |  |  |
| --- | --- | --- | --- |
| Fat % | Ctr-PO | Ctr-FO | VLC-Conc |
| ∑SFA \* | 29.30 | 30.25 | 32.34 |
| ∑MUFA † | 69.46 | 57.30 | 33.58 |
| ∑PUFA (≤C22) ‡ | 0 | 10.89 | 17.45 |
| EPA | 0 | 1.03 | 0.80 |
| DHA | 0 | 7.65 | 4.44 |
| ∑*n-3* VLC-PUFA § | 0 | 0.15 | 12.02 |

Ctr-PO, control plant oil; Ctr-FO, control fish oil; VLC-conc, very-long-chain concentrate; SFA, saturated fatty acids; MUFA, monounsaturated fatty acids; PUFA, polyunsaturated fatty acids; VLC-PUFA, very-long-chain polyunsaturated fatty acids; UI, unidentified

\* Includes 14:0, 16.0, 18:0, 20:0, 22:0;

† Includes 16:1, 18:1, 20:1, 22:1, 24:1;

‡ Includes 18:2 *n*-6, 20:4 *n*-3, 20:5 *n*-3, 22:5 *n*-3, 22:5 *n*-6, 22:6 *n*-6

§ Includes 24:4 *n*-3, 24:5 *n*-3, 24:6 *n*-3, 26:5 *n*-3, 26:6 *n*-3, 26:7 *n*-3, 28:5 *n*-3, 28:6 *n*-3, 28:7 *n*-3, 28:8 *n*-3