**Table 1S**

Formulation and proximate analysis of the experimental diets (% dry matter).

|  |  |
| --- | --- |
| Ingredients  | Diets (ELE supplementation level %) |
|  | Diet1 (0%) | Diet2 (0.5%) | Diet3 (1.0%) | Diet4 (2.0%) |
| Whitefish meal a | 36 | 36 | 36 | 36 |
| Krill meal b | 10 | 10 | 10 | 10 |
| Squid meal c | 4 | 4 | 4 | 4 |
| Soy protein concentrate b | 5 | 5 | 5 | 5 |
| Wheat gluten b | 12 | 12 | 12 | 12 |
| Yeast | 4 | 4 | 4 | 4 |
| microcrystalline celluloseto | 2 | 1.5 | 1.0 | 0 |
| α-Starch | 8 | 8 | 8 | 8 |
| Alginae sodium | 2 | 2 | 2 | 2 |
| Vitamin premix d | 1.5 | 1.5 | 1.5 | 1.5 |
| Mineral premix e | 1 | 1 | 1 | 1 |
| Ascorbyl polyphosphate | 0.2 | 0.2 | 0.2 | 0.2 |
| Mold inhibitor | 0.05 | 0.05 | 0.05 | 0.05 |
| Antioxidant | 0.05 | 0.05 | 0.05 | 0.05 |
| Choline chloride | 0.2 | 0.2 | 0.2 | 0.2 |
| Fish oil | 9 | 9 | 9 | 9 |
| Soybean lecithin | 5 | 5 | 5 | 5 |
| ELE f | 0 | 0.5 | 1.0 | 2.0 |
| Proximate composition |  |  |  |  |
| Crude protein | 53.52 | 53.79 | 53.81 | 53.13 |
| Crude lipid | 18.46 | 18.53 | 18.25 | 18.00 |
| Ash | 12.66 | 12.56 | 12.09 | 12.65 |

a Commercially available from Great Seven Biotechnology Co., Ltd in Qingdao, China; elementary composition (dry matter): White fish meal, crude protein, 71.73%, crude lipid,4.76%.

b Commercially available from Qingdao Bio-ways Ingredients Biotechnology Co., Ltd. (Qingdao, China); elementary composition (dry matter): Soy protein concentrate, crude protein, 66.70%. Wheat gluten, crude protein, 85.06%.

c Commercially available from market squid, then drying and crushing; elementary composition (dry matter): Squid meal, crude protein, 81.81%, crude lipid, 5.16%.

d Composition of vitamin premix (IU or g kg−1): vitamin A palmitate, 3000000 IU; vitamin D3, 1200000 IU; DL-α-vitamin E, 40.0 g kg-1; menadione, 8.0 g kg-1; thiamine-HCl, 5.0 g kg-1; riboflavin, 5.0 g kg-1; D-calcium pantothenate, 16.0 mg kg-1; pyridoxine-HCl, 4.0 mg kg-1; inositol, 200.0 mg kg-1; biotin, 8.0 mg kg-1; folic acid, 1.5 mg kg-1; 4-aminobenzoic acid, 5.0 mg kg-1; niacin, 20.0 mg kg-1 ;vitamin B12, 0.01 mg kg-1; L-ascorgyl-2-monophosphate-Na (3%),2000.0 mg kg-1.

e Composition of mineral premix (g kg−1 premix): Ca(H2PO4)· H2O,675.0; COSO4·H2O, 0.15; CuSO4·H2O, 5.0; FeSO4·7H2O, 50.0; KCl, 0.1; MnSO4·2H2O, 101.7; MnSO4·2H2O, 18.0; NaCl, 80.0; NaSeO3·H2O, 0.05; ZnSO4·7H2O, 20.0.

f The eucommia ulmoides leaf extract was purchased from Shaanxi Chen-xi Bio-Technology Co., Ltd in Shaanxi, China; elementary composition: chlorogenic acid, ≥3.5%; total flavone, ≥8.0%; polysaccharide, ≥20.0%.

**Table 2S**

Sequences of the PCR primers used in this study.

|  |  |  |  |
| --- | --- | --- | --- |
| Target gene | Forward primers (5′-3′) | Reverse primers (5′-3′) | Accession number |
| *npy* | AAAGAGGTCCAGTCCTGAGATT | GTGGCGGCTCATAGTGGTAA | XM019275410 |
| *ghrelin* | TGACCTTGTGGTGCAAGTCGAC  | CCGATTTCAAAGGGGGCACT  | KC899122 |
| *leptin* | GATGTTCTGGATGGACCTGC | AGACACCACTGATGCGGACT | XM010729765 |
| *tnfa* | ACACCTCTCAGCCACAGGAT | CCGTGTCCCACTCCATAGTT | NM001303385 |
| *ifnγ* | TCAGACCTCCGCACCATCA | GCAACCATTGTAACGCCACTTA | XM019258900 |
| *cox-2* | CTGGAAAGGCAACACAAGC | CGGTGAGAGTCAGGGACAT | XM010734489 |
| *il-1β* | CATAGGGATGGGGACAACGA | AGGGGACGGACACAAGGGTA | XM010736551 |
| *il-6* | CGACACACCCACTATTTACAAC | TCCCATTTTCTGAACTGCCTCT | XM010734753 |
| *β-actin* | GACCTGACAGACTACCTCATG | AGTTGAAGGTGGTCTCGTGGA | GU584189 |

*npy*: neuropeptide Y, *tnfa*: tumor necrosis factor *a*, *ifnγ*: interferon γ, *cox-2*: cyclooxygenase-2, *il-1β*: interleukin-1β, *il-6*: interleukin-6.