**Supplemental Table 1.** Formulation and chemical composition of the experimental diets (g/kg dry matter)

|  |  |  |  |
| --- | --- | --- | --- |
| Ingredient (g/kg) | Group |  |  |
|  | Control | LA1 | LA2 |
| Fish meal | 60 | 60 | 60 |
| Soybean meal | 291 | 291 | 291 |
| Cottonseed meal | 291 | 291 | 291 |
| Wheat flour | 286 | 286 | 286 |
| Lard oil | 17 | 17 | 17 |
| linseed oil | 15 | 15 | 15 |
| Soybean oil | 3 | 3 | 3 |
| Ca(H2PO4)2 | 15 | 15 | 15 |
| Mixture\* | 10 | 10 | 10 |
| α-Lipoic acid† | 0 | 0.6 | 1.2 |
| Bentonite | 12 | 11.4 | 10.8 |
| Total | 1000 | 1000 | 1000 |
| Proximate composition |  |  |  |
| Moisture (%) | 7.65 | 7.54 | 7.70 |
| Crude protein (%, N%\*6.25) | 38.79 | 38.03 | 38.48 |
| Lipid (%) | 5.56 | 5.58 | 5.36 |
| Ash (%) | 6.97 | 7.06 | 7.00 |

\* Contained 1% vitamin and 1% mineral; Ingredients including/1 kg: VA 67 IU, VD 16.2 IU, VE 7.4 g, VK3 340 mg, VB1 670 mg, VB2 1000 mg, VB6 800 mg, VB12 1.4 mg, VC 10 g, D-pantothenic acid 2.65 g, folic acid 330 mg, nicotinamide 5.35 g, choline chloride 35 g, biotin 34 mg, inositol 8 g, Fe 14 g, Cu 350 mg, Zn 4 g, Mn 1.4 mg, Mg 10 g, Co 30 mg, I 40 mg, Se 35 mg.

† Supplied by Suzhou Fushilai Pharmaceutical Co., Ltd. (Changshu, Jiangsu Province, China): > 99% purity.

**Supplemental Table 2.** Primers used in real-time quantitative PCR.

|  |  |  |  |
| --- | --- | --- | --- |
| Target gene | Accession number | Forward (5’-3’) | Reverse (5’-3’) |
| β-actin | DQ211096 | GACCTGACTGACTACCTCAT | CGAAGTCAAGAGCCACATAG |
| Diacylglycerol O-acyltransferase (DGAT) | KY800895 | CACCTTCCAAGTACCTTCTG | AGATCCCACTCGCCTATT |
| Lipoprotein lipase (LPL) | FJ716100 | TACAGCGGCGTTCACACTTG | CTACATGAGCACCAAGACTG |
| Fatty acid synthase (FAS) | GQ466046 | CCTCAGCTTACAGCAGAATC | CTCTTCAGCAAGGGAGTTTAG |
| Adipose triglyceride lipase (ATGL) | HQ845211 | TCGTGCAAGCGTGTATATG | GCTCGTACTGAGGCAAATTA |
| Hormone-sensitive lipase (HSL) | HQ446238 | TGGAACGTTACTGAGTCTGG | AAGCGCACGTTGACTGG |
| Fork head box o1 (Foxo1) | EF100905 | ATCATGCTGTGGGCTATTG | TCAAACACAGGAAGGAAGC |
| Peroxisome proliferator activated receptor α (PPARα) | FJ623265 | CGCTGAGGTTCGGATATTT | ACGTCACCTGGTCATTTAAG |
| Peroxisome proliferator activated receptor γ (PPARγ) | EU847421 | GCATCTGTACGAGTCCTATCT | GAGACTTCATGTCGTGGATAAC |
| Carnitine palmitoyltransferase 1 (CPT-1) | JF728839 | GCATCCATGACACGTTTATTC | GAAGTTTCTCTTCTCTCGTCTC |
| Target of rapamycin (TOR) | JX854449 | GGTACTGCAGAGAACTGATG | GAAAGTATGAGGCTGGAAGG |
| Insulin-like growth factor-1 (IGF) | EU051323.1 | CTTTAAGTGTACCATGCGCTGT | ATTTGCCGGTTTTCACGGGT |
| Ribosomal protein S6 kinase (S6K) | EF373673 | TGGAAAGGTTTTTCAAGTTCGCA | AGCTCTCCACCGCTAAGGTA |
| Glutamate dehydrogenase (GLDH) | KT861863 | CCGTGTAAAGGAGGTATCCGT | ATCAATGCCAGGCCCAATGA |
| Myogenic differentiation antigen (MyoD) | JQ793893.1 | CGAGAAGACGGAACAGTTATG | CACGATACTCGACAGACAATC |
| Myogenin (MyoG) | JQ793897.1 | GACAAACCGTCTCCATCATC | CTTGCGCTTACACACCTT |