

Table S1. Composition and nutrient content of the diet.

Ingredients	%	Nutrient content	%
Fish meal	7.80	Crude protein ⁴	28.69
Gelatin	6.00	Crude lipid ⁴	5.36
Soybean protein	26.00	n-3 ⁴	1.04
Corn starch	19.90	n-6 ⁴	0.96
α -starch	24.00	Available phosphorus ⁴	0.40
Fish oil	2.34		
Soybean oil	1.81		
Cellulose	5.00		
Ca (H ₂ PO ₄) ₂	1.30		
Vitamin premix ¹	1.00		
Mineral premix ²	2.00		
MOS premix ³	1.00		
Choline chloride	1.00		
Ethoxyquin (30%)	0.05		
DL-Met (99%)	0.61		
L-Trp (99%)	0.08		
Thr (98.5%)	0.11		

¹ Per kilogram of vitamin premix (g kg⁻¹): retinyl acetate (500,000 IU g⁻¹), 0.39; cholecalciferol (500,000 IU g⁻¹), 0.40; D, L- α -tocopherol acetate (50%), 23.23; menadione (22.9%), 0.83; cyanocobalamin (1%), 0.94; D-biotin (2%), 0.75; folic acid (95%), 0.42; thiamine nitrate (98%), 0.09; ascorhyl acetate (95%), 9.77; niacin (99%), 4.04; meso-inositol (98%), 19.39; Calcium-D-pantothenate (98%), 3.85; riboflavin (80%), 0.73; pyridoxine hydrochloride (98%), 0.62. All ingredients were diluted with corn starch to 1 kg.

² Per kilogram of mineral premix (g kg⁻¹): MnSO₄·H₂O (31.8% Mn), 2.6590; MgSO₄·H₂O (15.0% Mg), 200.0000; FeSO₄·H₂O (30.0% Fe), 12.2500; ZnSO₄·H₂O (34.5% Zn), 8.2460; CuSO₄·5H₂O (25.0% Cu), 0.9560; KI (76.9% I), 0.0650; Na₂SeO₃ (44.7% Se), 0.0168. All ingredients were diluted with corn starch to 1 kg.

³ MOS premix (mg kg⁻¹): premix was added to obtain graded levels of MOS.

⁴ Crude protein and crude lipid content were measured value. Available phosphorus, n-3 and n-6 contents calculated according to NRC (2011).

Table S2 Real-time PCR primer sequences ¹.

Target gene	Primer sequence (5'→3')	Temperature(°C)	Accession number
<i>Occludin</i>	Forward: TATCTGTATCACTACTGCGTCG Reverse: CATTCAACCAATCCTCCA	59.4	KF193855
<i>ZO-1</i>	Forward: CGGTGTCTTCGTAGTCGG Reverse: CAGTTGGTTTGGGTTTCAG	59.4	KJ000055
<i>ZO-2</i>	Forward: TACAGCGGGACTCTAAAATGG Reverse: TCACACGGTCGTTCTCAAAG	60.3	KM112095
<i>Claudin-b</i>	Forward: GAGGGAATCTGGATGAGC Reverse: ATGGCAATGATGGTGAGA	57.0	KF193860
<i>Claudin-c</i>	Forward: GAGGGAATCTGGATGAGC Reverse: CTGTTATGAAAGCGGCAC	59.4	KF193859
<i>Claudin-f</i>	Forward: GCTGGAGTTGCCTGTCTTATTC Reverse: ACCAATCTCCCTCTTTTGTGTC	57.1	KM112097
<i>Claudin-3c</i>	Forward: ATCACTCGGGACTTCTA Reverse: CAGCAAACCAATGTAG	57.0	KF193858
<i>Claudin-7a</i>	Forward: ACTTACCAGGGACTGTGGATGT Reverse: CACTATCATCAAAGCACGGGT	59.3	KT625604
<i>Claudin-7b</i>	Forward: CTAAGTGTGGTGGTGATGAC Reverse: AACAAATGCTACAAAGGGCTG	59.3	KT445866
<i>Claudin-11</i>	Forward: TCTCAACTGCTCTGTATCACTGC Reverse: TTTCTGGTTCACCTCCGAGG	62.3	KT445867
<i>Claudin-12</i>	Forward: CCCTGAAGTGCCACAA Reverse: GCGTATGTCACGGGAGAA	55.4	KF998571
<i>Claudin-15a</i>	Forward: TGCTTTATTTCTTGCTTTC Reverse: CTCGTACAGGGTTGAGGTG	59.0	KF193857
<i>Claudin-15b</i>	Forward: AGTGTTCTAAGATAGGAGGGGAG Reverse: AGCCCTTCTCCGATTCAT	62.3	KT757304
<i>JAM-A</i>	Forward: ACTGTGAGGTGCTTGGAA Reverse: CTGTTGTGACTGAAGAAGGA	61.4	KY780630
<i>E-cadherin</i>	Forward: GACTGTAACGCTGAAGAGA Reverse: CTGTGGAGAGGAGATGTTC	61.4	MN661354
<i>α-catenin</i>	Forward: GCAATCTTCTCTCCTTTATCC Reverse: ACTTGTGAACTCCAGCAAT	61.4	HQ338751
<i>β-catenin</i>	Forward: GTCTGCTTGCCATCTTCA Reverse: CAGGTTGTGTAGAGTCGTAA	64.5	MN661349
<i>Nectin</i>	Forward: GCCAGTGACCAAGATGAC	61.4	MN661350

	Reverse: ACAGTGCCATTTCGGATTG		
<i>Afadin</i>	Forward: CCTGTGCTCACACTACTG	61.4	MN661352
	Reverse: GTCGTTGCCTGGACTATG		
<i>MLCK</i>	Forward: GAAGGTCAGGGCATCTCA	53.0	KM279719
	Reverse: GGGTCGGGCTTATCTACT		
<i>RhoA</i>	Forward: GCAGGACAAGAGGACTATG	63.3	MN661351
	Reverse: GTGTTTCATCATTCCGTAGGT		
<i>ROCK</i>	Forward: AGTCCAAGTCTGCTGCTA	63.3	KY780630
	Reverse: CCTCTCCTTCTGCTTCATC		
<i>NMII</i>	Forward: AGCCAACTCGTCAATGTC	61.4	MN661353
	Reverse: CCTTGGAATACTTCTCTGTCT		
<i>β-actin</i>	Forward: GGCTGTGCTGTCCCTGTA	61.4	M25013
	Reverse: GGGCATAACCCTCGTAGAT		
<i>GAPDH</i>	Forward: GTTACAAGGGAGAAGTTCACCAT	58.0	GQ266395
	Reverse: CCGGTAGACTCGACTACATACAG		

¹ *ZO*, zonula occludins; *JAM-A*, junctional adhesion molecule-A; *RhoA*, a small Rho GTPase protein; *ROCK*, the Rho associated protein kinase; *MLCK*, myosin light chain kinase; *NMII*, Non-muscle myosin II.