

Table S1. Feed formula of basal diet used in this study

Component	Content (%)
Soybean meal (with hulls)	35
Wheat middling	10
Barley malt sprouts	17.5
Brewer's grain	10
Alfalfa meal	10
Wheat bran	10
Palm oil	2
Monocalcium phosphate	2
Mineral premix	1
Bentonite	1
Gelatinized starch (corn)	0.28
Vitamin premix	1
NaCl	0.2
Ethoxyquin	0.02

Vitamin premix is purchased by a commercial production (Yulong®, Guangzhou Southern Biotechnology Company Limited, Guangzhou, China. License number: Guangdong feeding (2020) 01131. Executive standard: Q/NFSW 19-2021). Mineral premix is purchased from feed manufacturer (Chelota®, Chelota Biotechnology Group Company Limited, Deyang, China. License number: Sichuan feed premix (2015) 05005). HLM and other feed ingredients are purchased from the feed market of Guangzhou.

Table S2. The initial and final weight of average daily gain measurement.

No.	Control		5% HLM		10% HLM		20% HLM	
	Initial weight (g)	Final weight (g)	Initial weight (g)	Final weight (g)	Initial weight (g)	Final weight (g)	Initial weight (g)	Final weight (g)
1	711	1152.05	728.24	1437.66	740.04	1849.61	714.09	2463.48
2	712.94	1177.2	717.3	1389.33	729.85	1905.28	735.53	2540.89
3	700.99	1145.47	728.96	1472.9	740.04	1926.79	678.74	2556.75

No. means that the number of replicates for each treatment group. There were 12 tilapias per group.

Table S3. Flavor composition of tilapia.

Flavor compound	RT (min)	RI	HMD-BID	Abundance (mean ± SEM)			
				Control	5% HLM	10% HLM	20% HLM
Cytosine	17.64	1525	000063	2.03E+06 ±	2.76E+06 ±	3.52E+06 ±	4.26E+06 ±
			0	4.55E+04	1.82E+04	5.77E+04	3.36E+04
Guanosine	40.57	2792	000013	5.32E+06 ±	6.78E+06 ±	7.80E+06 ±	8.92E+06 ±
			3	1.23E+05	6.78E+04	5.57E+04	6.65E+04
Inosine	37.54	2624	000019	2.76E+07 ±	3.99E+07 ±	5.14E+07 ±	6.48E+07 ±
			5	1.17E+06	5.85E+05	1.40E+06	4.97E+05
Uridine	41.27	2442	000029	2.74E+06 ±	3.73E+06 ±	4.74E+06 ±	5.71E+06 ±
			6	3.11E+04	4.05E+04	3.31E+04	4.22E+04
Xanthine	28.25	2121	000029	5.39E+06 ±	7.31E+06 ±	9.25E+06 ±	1.25E+07 ±
			2	1.61E+05	1.56E+05	1.54E+05	4.50E+05
Alanine	7.05	1153	000016	1.32E+07 ±	1.81E+07 ±	2.41E+07 ±	2.83E+07 ±
			1	6.39E+05	4.77E+05	4.81E+05	4.63E+05

Aspartic acid	17.61	1348	000019 1	1.55E+08 ± 1.17E+06	2.14E+08 ± 4.98E+06	2.65E+08 ± 3.13E+06	3.04E+08 ± 2.16E+06
Glutamic acid	17.67	1508	000014 8	1.78E+07 ± 4.59E+05	2.77E+07 ± 4.86E+05	3.75E+07 ± 5.34E+05	4.74E+07 ± 5.10E+05
Glycine	7.41	1071	000012 3	7.92E+07 ± 3.79E+05	9.94E+07 ± 3.16E+05	1.45E+08 ± 1.41E+06	1.80E+08 ± 4.50E+05
Tyrosine	25.33	1962	000015 8	3.06E+06 ± 4.66E+04	4.09E+06 ± 5.48E+04	5.07E+06 ± 6.19E+04	6.07E+06 ± 5.05E+04
9,12-Octadeca- dienoic acid	31.32	2214	024770 6	1.14E+06 ± 2.53E+04	1.51E+06 ± 6.78E+03	1.83E+06 ± 1.87E+04	2.39E+06 ± 5.53E+04
9,12,15-Octade- catienoic acid	30.91	2212	000138 8	3.43E+07 ± 1.39E+06	4.42E+07 ± 5.85E+05	5.77E+07 ± 2.33E+05	6.79E+07 ± 2.73E+05
9-Octadecenoic acid	31.54	2218	006270 3	2.24E+06 ± 4.61E+04	2.66E+06 ± 2.11E+04	3.14E+06 ± 2.59E+04	3.49E+06 ± 3.32E+04
Arachidonic acid	38.73	2369	000104 3	8.34E+06 ± 8.87E+04	1.15E+07 ± 3.64E+05	1.54E+07 ± 1.35E+05	1.82E+07 ± 2.16E+05
2-Methyl-3-fu- ranthiol	7.23	1077	003661 1	1.91E+06 ± 7.39E+04	3.02E+06 ± 4.14E+05	3.92E+06 ± 7.36E+04	4.96E+06 ± 9.18E+04
Nonanal	8.52	1323	005983 5	2.53E+05 ± 6.28E+03	4.02E+05 ± 9.20E+04	6.07E+05 ± 2.66E+04	8.14E+05 ± 3.55E+04
Trimethylamine	8.17	748	003253 9	5.69E+06 ± 3.07E+04	4.73E+06 ± 4.28E+04	3.69E+06 ± 3.24E+04	2.73E+06 ± 4.22E+04

RI: Kovats retention index (RI). RT is the retention time in minutes. Abundance values of GC-MS detection represent relative content in these samples, with a unit of 1, where the abundance of each group is expressed as mean ± SEM.