

TABLE 7-1 Nutrient Requirements for Channel Catfish, Rainbow Trout, Pacific Salmon, Common Carp, and Tilapia as Percentages of Diet, Milligrams per Kilogram of Diet, or International Units (IU) per Kilogram of Diet (as-fed basis)^a

	Channel Catfish	Rainbow Trout	Pacific Salmon	Common Carp	Tilapia
Energy Base ^b (kcal DE/kg diet)→	3,000	3,600	3,600	3,200	3,000
Protein, crude (digestible), percent	32 (25)	35 (34)	35 (34)	35 (30.5)	32 (25)
Amino acids					
Arginine, percent	1.20	1.5	2.04	1.31	1.18
Histidine, percent	0.42	0.7	0.61	0.64	0.48
Isoleucine, percent	0.73	0.9	0.75	0.76	0.57
Leucine, percent	0.98	1.4	1.33	1.00	0.95
Lysine, percent	1.43	1.8	1.70	1.74	1.43
Methionine + cystine, percent	0.64	1.0	1.36	0.94	0.90
Phenylalanine + tyrosine, percent	1.40	1.8	1.73	1.98	1.55
Threonine, percent	0.56	0.8	0.75	1.19	1.05
Tryptophan, percent	0.14	0.2	0.17	0.24	0.28
Valine, percent	0.84	1.2	1.09	1.10	0.78
n-3 fatty acids, percent	0.5-1	1	1-2	1	—
n-6 fatty acids, percent	—	1	—	1	0.5-1
Macrominerals					
Calcium, percent	R	1E	NT	NT	R
Chlorine, percent	R	0.9E	NT	NT	NT
Magnesium, percent	0.04	0.05	NT	0.05	0.06
Phosphorus, percent	0.45	0.6	0.6	0.6	0.5
Potassium, percent	R	0.7	0.8	NT	NT
Sodium, percent	R	0.6E	NT	NT	NT
Microminerals					
Copper, mg/kg	5	3	NT	3	R
Iodine, mg/kg	1.1E	1.1	0.6-1.1	NT	NT
Iron, mg/kg	30	60	NT	150	NT
Manganese, mg/kg	2.4	13	R	13	R
Zinc, mg/kg	20	30	R	30	20
Selenium, mg/kg	0.25	0.3	R	NT	NT
Fat-soluble vitamins					
A, IU/kg	1,000-2,000	2,500	2,500	4,000	NT
D, IU/kg	500	2,400	NT	NT	NT
E, IU/kg	50	50	50	100	50
K, mg/kg	R	R	R	NT	NT
Water-soluble vitamins					
Riboflavin, mg/kg	9	4	7	7	6
Pantothenic acid, mg/kg	15	20	20	30	10
Niacin, mg/kg	14	10	R	28	NT
Vitamin B ₁₂ , mg/kg	R	0.01E	R	NR	NR
Choline, mg/kg	400	1,000	800	500	NT
Biotin, mg/kg	R	0.15	R	1	NT
Folate, mg/kg	1.5	1.0	2	NR	NT
Thiamin, mg/kg	1	1	R	0.5	NT
Vitamin B ₆ , mg/kg	3	3	6	6NT	—
Myo-inositol, mg/kg	NR	300	300	440	NT
Vitamin C, mg/kg	25-50	50	50	R	50

NOTE: These requirements have been determined with highly purified ingredients in which the nutrients are highly digestible, therefore the values presented represent near 100 percent bioavailability.

^aR, required in diet but quantity not determined; NR, no dietary requirement demonstrated under experimental conditions; NT, not tested; and E, estimated.

^bTypical energy concentrations in commercial diets.