

Table 1 Formulation and proximate composition of experimental diets

Ingrédients (%)	Dietary protein					
	25%	35%	40%	45%	50%	60%
Casein <sup>a</sup>	8	16	21	27	34	44
Fish meal <sup>b</sup>	20.00	25.00	28.00	28.00	28.00	28.00
Yeast <sup>c</sup>	13.00	14.00	14.00	14.00	14.00	14.00
Dextrin <sup>d</sup>	22.50	10.00	7.00	6.00	3.50	2.00
Glucose <sup>e</sup>	25.00	23.50	19.50	14.50	10.00	2.00
Cod liver oil <sup>f</sup>	2.50	2.50	2.00	2.00	2.00	2.00
Soya oil <sup>g</sup>	3.00	3.00	2.50	2.50	2.50	2.00
Vitamin premix <sup>h</sup>	2.50	2.50	2.50	2.50	2.50	2.50
Mineral premix <sup>i</sup>	2.50	2.50	2.50	2.50	2.50	2.50
Carboxyméthylcellulose	1.00	1.00	1.00	1.00	1.00	1.00
<i>Proximate composition</i>						
Dry matter (DM, %)	81.10	81.50	84.12	85.70	87.82	87.53
Ash (% DM)	4.83	8.75	9.45	4.02	11.05	11.24
Crude protein (% DM)	25.97	35.54	41.10	45.48	50.59	57.88
Crude fat (% DM)	7.60	8.27	7.67	7.81	7.97	7.70
Gross energy (MJ/100g)	1.67	1.67	1.65	1.64	1.64	1.61
Protein / Energy (g/MJ)	15.55	21.28	24.90	27.73	30.84	35.95

Note: <sup>a</sup> 100% Casein complex, Scitec Nutrition (73% crude protein, 2.3% crude fat, 14.7 KJ g<sup>-1</sup> gross energy, Miami, USA); <sup>b</sup> Ghana farming network Ltd (64% crude protein, 9.6% crude fat, 18.7 KJ g<sup>-1</sup> gross energy, Accra, Ghana); <sup>c</sup> *Saccharomyces cerevisiae*, S.I. Lesaffre (56% crude protein, 0% crude fat, 16.72 KJ g<sup>-1</sup> gross energy, France); <sup>d</sup> Nestlé HealthCare Nutrition GmbH, D-67574 Osthofen (0.2% crude protein, 0% crude fat, 16.18 KJ.g<sup>-1</sup> gross energy); <sup>e</sup> SIGMA-ALDRICH (0% crude protein, 0% crude fat, 15.94 KJ g<sup>-1</sup> gross energy, France); <sup>f</sup> Setalg, France (0% crude protein, 100.0% crude fat, 37.00 KJ g<sup>-1</sup> gross energy, France); <sup>g</sup> Songhai center (0% crude protein, 99.9% crude fat, 37.00 KJ g<sup>-1</sup> gross energy, Benin); <sup>h</sup> Vitamin premix contains (g 100 g<sup>-1</sup> of premix): ascorbic acid, 50.0; D-calcium pantothenate, 5.0; choline chloride, 100.0; inositol, 5.0; menadione, 2.0; niacin, 5.0; pyridoxine HCl, 1.0; riboflavin, 3.0; thiamin HCl, 0.5; DL-alpha-tocopherol acetate (250 IU g<sup>-1</sup>), 8.0; vitamin A acetate (20,000 IU g<sup>-1</sup>), 5.0; vitamin micro-mix, 10.0; cellulose, 805.5. Vitamin micro-mix contains (g kg<sup>-1</sup> of micro-mix): biotin, 0.5; cholecalciferol (1 µg = 40 IU), 0.02; folic acid, 1.8; vitamin B<sub>12</sub>, 0.02; cellulose, 97.66; <sup>i</sup> Mineral premix contains (g kg<sup>-1</sup> of premix): calcium phosphate (monobasic) monohydrate, 136.0; calcium lactate pentahydrate, 348.49; ferrous sulfate heptahydrate, 5.0; magnesium sulfate heptahydrate, 132.0; potassium phosphate (dibasic), 240.0; sodium phosphate (monobasic) monohydrate, 88.0; sodium chloride, 45.0; aluminum chloride hexahydrate, 0.15; potassium iodide, 0.15; cupric sulfate pentahydrate, 0.50; manganese sulfate monohydrate, 0.70; cobalt chloride hexahydrate, 1.0; zinc sulfate heptahydrate, 3.0; sodium selenite, 0.011