

## Supplementary Information

### Supplementary Table S1

Ingredient g/100g diet	HC	NC	Challenge
Fish meal <sup>1</sup>	22.8	91.2	56.4
Fish oil <sup>2</sup>	13.2	4.8	9.6
Starch <sup>3</sup>	40.0	0.0	30.0
Glucose <sup>4</sup>	20.0	0.0	0.0
Vitamin mix <sup>5</sup>	1.0	1.0	1.0
Mineral mix <sup>6</sup>	1.0	1.0	1.0
Alginate <sup>7</sup>	2.0	2.0	2.0
<i>Approximate composition</i>			
Dry matter, DM (% diet)	90.1	93.4	92.0
Crude protein (% DM)	18.0	63.0	41.9
Crude lipids (% DM)	15.8	16.1	12.9
Gross energy (KJ g <sup>-1</sup> DM)	21.6	22.4	21.1
Ash (% DM)	5.0	15.6	11.3
Carbohydrates (% DM)	48.8	2.4	26.8

**Table S1. Formulation and proximate composition of experimental diets used in this experiment.** HC, high carbohydrate diet; NC, no carbohydrate diet.<sup>1</sup> Sopropeche, Boulogne-sur-Mer, France; <sup>2</sup> Sopropeche, Boulogne-sur-Mer, France; <sup>3</sup> gelatinized corn starch (Roquette, Lestrem, France); <sup>4</sup> D-(+)-glucose (Sigma-Aldrich, G7021); <sup>5</sup> supplying (kg<sup>-1</sup> diet): 60 IU DL- $\alpha$ -tocopherol acetate, 5 mg sodium menadione bisulphate, 15,000 IU retinyl acetate, 3000 IU DL-cholecalciferol, 15 mg thiamine, 30 mg riboflavin, 15 mg pyridoxine, 0.05 mg vitamin B<sub>12</sub>, 175 mg nicotinic acid, 500 mg folic acid, 1000 mg inositol, 2.5 mg biotin, 50 mg calcium pantothenate and 2000 mg choline chloride; <sup>6</sup> supplying (kg<sup>-1</sup> diet): 2.15 g calcium carbonate (40% Ca), 1.24 g magnesium oxide (60% Mg), 0.2 g ferric citrate, 0.4 mg potassium iodide (75% I), 0.4 g zinc sulphate (36% Zn), 0.3 g copper sulphate (25% Cu), 0.3 g manganese sulphate (33% Mn), 5 g dibasic calcium phosphate (20% Ca, 18% P), 2 mg cobalt sulphate, 3 mg sodium selenite (30% Se), 0.9 g potassium chloride and 0.4 g sodium chloride; and <sup>7</sup> Louis François, Marne-la-Vallée, France.