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Review

# Macronutrient Requirements of Silvery-Black Porgy (*Sparidentex hasta*): A Comparison with Other Farmed Sparid Species

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Academic Editor: Francisco J. Moyano
Received: 31 January 2017; Accepted: 5 May 2017; Published: 13 May 2017

**Abstract:** Silvery-black porgy (*Sparidentex hasta*) is recognized as one of the most promising fish species for aquaculture diversification in the Persian Gulf and the Oman Sea regions. In this regard, *S. hasta* has received considerable attention, and nutritional studies focused on establishing the nutritional requirements for improving diet formulation have been conducted during recent years. Considering the results from different dose–response nutritional studies on macronutrient requirements conducted in this species, it can be concluded that diets containing ca. 48% crude protein, 15% crude lipid, 15% carbohydrates and 20 KJ $g^{-1}$ gross energy are recommended for on-growing *S. hasta* juveniles. In addition, the optimum essential amino acid profile for this species (expressed as g 16 g $N^{-1}$), should be approximately arginine 5.3, lysine 6.0, threonine 5.2, histidine 2.5, isoleucine 4.6, leucine 5.4, methionine + cysteine 4.0 (in a diet containing 0.6 cysteine), phenylalanine + tyrosine 5.6 (in a diet containing 1.9 tyrosine), tryptophan 1.0 and valine 4.6. Moreover, the optimum dietary n-3 long chain polyunsaturated fatty acids and soybean lecithin are recommended to be 0.8% and 6%, respectively. The maximum replacement of fish meal with soy protein is recommended to be between 16.5% and 27.3%. In addition, different vegetal oil sources are also recommended for partial and almost complete replacement of fish oil in diets. Although the nutritional requirements in terms of macronutrients have been established under laboratory conditions, the analysis of the available literature indicate that future studies need to be conducted using a more holistic approach under intensive farming conditions in which different nutrients or additives need to be tested under different rearing conditions for refining nutrient requirements in this species.

**Keywords:** protein sources; lipids; fish meal substitution; essential amino acids; essential fatty acids; sobaity sea bream

## 1. Introduction

Due to their aquaculture potential, several new sparid species have been considered in recent years as potential candidates for aquaculture diversification in the world, taking advantage of their easy adaptation to captivity and the use of available production technology (i.e., husbandry and rearing protocols, diets, production facilities, etc.) similar to those of well-established aquaculture species such as the gilthead seabream (*Sparus aurata*) and red seabream (*Pagrus major*) [1]. Among different finfish species from the Persian Gulf and the Oman Sea regions, the silvery-black porgy,