

Effects of dehulled soybean meal as a fish meal replacer and apparent digestibility of the experimental diets in growing Korean rockfish *Sebastes schlegeli*

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Introduction

Feed cost accounts for approximately 50~70% of the fish production costs (Bai, 1996), and protein feedstuffs are the most important ingredient to formulate fish feeds. Fish meal is one of the most important protein sources in fish feeds. Therefore, demand for fish meal continuously increase and its price will stay high in the future. Because of limiting supply of fish meal around the world, the cost of producing fish would be expected to increase. Soybean meal has been tested to some degree in this capacity because of its generally favorable protein content and amino acid profile. Therefore, the purpose of this experiment is to evaluate dehulled soybean meal (DHSM) as a fish meal (FM) replacer in growing Korean rockfish diets.

Materials and Methods

This experiment was conducted to evaluate dehulled soybean meal (DHSM) as a fish meal (FM) replacer and to determine the proper inclusion level of dehulled soybean meal in growing Korean rockfish *Sebastes schlegeli* diets for 12weeks. The percentages of the grades levels of replacement of FM by DHSM on the basis of crude protein (CP) as follows: DHSM₀ (Control), 100% FM; DHSM₁₀, 90%FM : 10% DHSM; DHSM₁₅, 85% FM : 15% DHSM ; DHSM₂₀, 80% FM : 20% DHSM; DHSM_{20+AA}, 80% FM : 20% DHSM + Met & Lys; DHSM_{30+AA}, 70% FM : 30% DHSM + Met & Lys. Six experimental diets were formulated to contain 48% CP and 16.0 KJ available energy g⁻¹ by varying lipid content. Fish averaging 21.5 ± 0.05g (Mean ± SD) were distributed to each aquarium as a group of 20 fish reared in the flow

through system. Each diet were fed to triplicate groups to apparent satiation 2 times per day at a rate of 2.5% dry matter basis diet of wet body weight. At the end of the feeding trial, fish were counted to calculate weight gain (WG), feed efficiency (FE), specific growth rate (SGR), protein efficiency ratio (PER). IPF ratio (intraperitoneal fat ratio), condition factor (CF) and survival.

Results and Conclusions

There was no significant difference in weight gain (WG), feed efficiency (FE), specific growth rate (SGR) and intraperitoneal fat (IPF) ratio among fish fed six experimental diets ($P>0.05$). Apparent digestibility(AD)of fish fed DHSM₁₅, DHSM₂₀ and DHSM_{30+AA} diets were no significantly ($P>0.05$) different from those of fish fed the control diet. Apparent protein digestibility(ADP) showed the same trend as Apparent digestibility(AD). Therefore, based on the above results, we concluded that dehulled soybean meal could replace fish meal up to 20% without amino acids supplementation and up to 30% with amino acids (Met, Lys) supplementation for the maximum growth of growing Korean rockfish.

Table 1. Effects of the experimental diets for 12weeks in growing Korean rockfish

	diets						Pooled SEM
	DHSM ₀	DHSM ₁₀	DHSM ₁₅	DHSM ₂₀	DHSM _{20+AA}	DHSM _{30+AA}	
WG(%)	277.2	275.1	271.3	270.4	274.3	271.6	0.93
FE(%)	83.9	83.5	83.2	82.0	83.2	81.5	0.28
SGR(%)	1.58	1.57	1.56	1.56	1.57	1.56	0.003
PER	1.75 ^a	1.74 ^{ab}	1.73 ^{ab}	1.71 ^{ab}	1.70 ^b	1.70 ^b	0.003

Table 2. Apparent digestibility and apparent protein digestibility in Korean rockfish (% DM basis)

	Diets								Pooled SEM
	DHSM ₀	DHSM ₁₅	DHSM ₂₀	DHSM ₃₀	DHSM ₄₅	DHSM _{30+AA}	DHSM _{45+AA}	DHSM _{60+AA}	
AD (%)	82.0 ^a	78.3 ^a	77.4 ^{ab}	75.2 ^b	71.0 ^c	78.1 ^{ab}	74.2 ^b	71.0 ^c	0.78
ADP (%)	91.3 ^a	89.2 ^a	87.4 ^{ab}	86.2 ^b	81.3 ^c	88.3 ^{ab}	84.2 ^b	81.9 ^c	0.72

References

- Bai, S. C. 1996. Utilization of low Quality protein sources in fish feed production, Proceedings of the international symposium on aquaculture, pp121~127, Ocean University of Qingdao, China, November.