

Development of Diets for Gilthead Bream *Sparus aurata* L. cultured in Egypt

Elham A. WASSEF(*)

Fish Nutrition Laboratory, National Institute of Oceanography and Fisheries, Alexandria (Egypt)

ABSTRACT

Two novel raw materials, dry germinated soyabean meal and fish silage, were used as the major protein sources in *Sparus aurata* feeds. Amino acid analyses of both materials, on one hand and the experimental fish on the other hand, proved that they meet or exceed the requirements of the species.

Three balanced diets were formulated on the basic idea of replacement of fish meal either partially, by defatted soyabean meal/dried germinated soyameal, or completely by a mixture of both soyabean meal and fish silage. Preliminary observations, under aquarium conditions, indicated that these artificial feeds are appropriate for the species.

Table 1. Composition (% Dry Weight) of raw materials.

Ingredients	Crude protein	Ether extract	Carbo-hydrates*	Metabolic energy	Calcium	Phosphorus
Fish silage	73.4	17.1	1.2	14.7**	1.0	1.5
Soyabean meal, defatted	44.0	1.0	39.3	9.4	0.3	0.6
Fish meal	65.0	4.0	5.0	11.8	6.0	3.0
Dried germinated soya	43.9	16.7	28.2	15.4**	0.2	0.6
Cod liver-oil	-	100	-	35.0	-	-
Soyabean oil	-	100	-	37.0	-	-
Wheat starch	-	-	100	13.0	-	-
Calcium carbonate	-	-	-	-	38.0	-

* Includes nitrogen free extract and crude fiber.

** Estimated.

Table 2. Amino acid profiles for soyabean meal, fish silage and sea bream muscles.

Amino acid	Dry germinated soyabeans (g/100g)	Fish silage	Sea bream muscles (g/100g protein)	requirements*
Arginine	5.59	4.97	4.14	1.7/34**
Histidine	4.30	3.24	1.97	-
Threonine	2.97	3.58	5.63	-
Isoleucine	3.64	3.65	2.18	-
Leucine	6.09	6.08	6.06	-
Valine	3.86	4.13	3.60	-
Lysine (LYS)	4.49	7.23	6.49	1.7/34
Methionine	1.25	2.48	1.88	1.4/34
Tryptophan	-	0.87	-	0.2/34
Phenyl alanine	4.30	3.24	1.75	-
Aspartic acid	15.20	8.19	8.85	-
Serine	4.15	3.60	6.63	-
Glutamic acid	13.03	12.09	11.54	-
Glycine	3.14	4.80	17.45	-
Alanine	3.54	5.13	14.57	-
Tyrosine	4.03	2.80	1.22	-
Proline	4.46	3.57	3.71	-
Cystine	1.13	0.67	-	-
Availability LYS	4.31	-	-	-
% availability	96%	100%	-	-
% recovery	83%	79%	-	-

* After Sabaut and Luquet, 1974 (Loc. cited Wilson, 1985).

** Percent of protein in the diet.

REFERENCES

- DIVANACH, P., KENTOURI, M. AND DEWAVRIN, 1986. Sur le sevrage et l'évolution des Performances biologiques d'alevins de daurades, *Sparus aurata*, provenant d'élevage extensif, après remplacement des nourrisseurs en continu par des distributeurs libre service. *Aquaculture*, 52 : 21-29.
- EISAWY, A. AND WASSEF, E., 1984. Preliminary studies on rearing of the gilthead seabream, *Sparus aurata*, in brackish water ponds. *Aquaculture*, 38: 255-260.
- KRALJEVIC, M., 1984. On the experimental feeding of sea bream (*Sparus aurata* L.) under aquarium conditions. *Acta Adriat.* 25 (1/2) : 183-204.
- WILSON, R.P., 1985. Amino acid and protein requirements of fish. In : Nutrition and Feeding in Fish. Cowey, C.B., Mackie, A.M. and Bell, J.(eds), Academic Press London, 1-16.

(*) Present address, Girls College, Jeddah, Saudi Arabia.