

EGG QUALITY CHARACTERS OF LAYERS FED WITH LEATHER JACKET FISH (ODONUS SP) MEAL

R. Kavitha* and B. Mohan

Department of Animal Nutrition, Veterinary College and Research Institute,
Namakkal, Tamil Nadu – 637 001, India

Abstract: Two hundred white leghorn pullet birds of similar age and body weight were randomly divided into five treatment groups of 40 birds each. The birds were fed leather jacket fish meal (LJFM) (CP- 45.0%, EE-4.2 %, TA-26.0%, Ca- 6.0%, Ph-3.5% and AIA – 4.0%) at levels of 0, 2, 4, 6 and 8% in the diet for 56 days. The egg weight, albumen index, haugh unit, yolk index, yolk colour and shell thickness did not differ significantly among the various treatment groups. The results of taste panel score of hard cooked eggs showed a marginally lowered acceptable flavor in 8% LJFM group but the same condition was not seen when the eggs were scrambled and served. It is inferred from the results that the LJFM can be included safely and economically upto 8% level in commercial layer rations.

Keywords: Egger – type layer rations – leather jacket fish meal (odonus sp.) – Feeding value.

Introduction

Animal proteins have been a part of chicken ration for a very long time. The beneficial effect of fishmeal in improving the body weight gain, egg production has been well established but off late poultry entrepreneur often complaint problems of adulteration in fishmeal by the addition of tannery waste, urea etc. This often impairs the production performance of the birds. Hence, Poultry entrepreneur have started to purchase whole fish and process it into a meal before addition into the chicken ration. This has resulted in an improved production performance. Simultaneously, these have been as increased the demand for the fish both for the human consumption and animal feed processing. Hence, an alternate human inedible fish was explored for processing as a meal for chicken feed. One such fish is leather jacket (Odonus sp) which is available in plenty in the coastal districts of Tamil Nadu especially in Kanya Kumari District. It appears leathery in nature on drying and imparts as mild off flavor. Its preference for human consumption was comparatively lesser when compared to sardines and mackerels.

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Materials and Methods

Proximate Analysis

Dried LJFM was procured from fishermen in Kanyakumari District in Tamil Nadu and were analyzed for Proximate composition viz. Crude Protein (CP), Crude Fibre (CF), Ether Extract (EE), Total Ash (TA) and minerals namely calcium and Phosphorous as per the method of AOAC (1990). The NFE was calculated by difference.

Biological Experiments

A total of 200 white leghorn pullet birds of 22 weeks age with similar body weight were randomly divided into 5 groups of 40 birds. The Dietary treatment groups contained 0%, 2%, 4%, 6% and 8% inclusion of LJFM in an iso - caloric and iso-nitrogenous layer mash were fed for 56 days. All the birds were reared in well prepared two-tier cages following standard managemental practices uniformly for all treatment groups. Throughout the experiment water and feed were provided ad-libitum.

Egg Quality Studies

Ten eggs from each treatment were collected daily and weighed throughout the fifty six days of experimental period. In addition every week nine eggs per treatment were randomly collected and the internal qualities of eggs viz. albumen index, yolk index, haugh unit, yolk colour and shell thickness were analysed as per the standard methods.

Organoleptic qualities of eggs

During the last 4 weeks of experiment, 3 eggs per treatment per week were collected and were hard cooked and prepared as scrambled egg and served to ten panel members to assess the organoleptic properties viz. the colour, texture, chewability, flavour and overall acceptance of eggs (panda et al 1982) The data collected on various parameters were statistically analyzed as per the method of snedcor and cochrane (1989).

Results and Discussion

S.M. Mandekar et al (1993)-reported supplementation of layer diets containing oil cakes like groundnut cake and soya bean cake with fish meal as a source of animal protein results in significantly higher egg production, egg mass, feed efficiency. The egg weight, albumen index, haugh unit, yolk index, yolk colour and shell thickness did not differ significantly among the various treatment groups. Naulia et al (1998) also did not observe any significant difference in the various level of fish meal diet. The results of the taste panel score of hard cooked egg showed a marginally lowered acceptable flavour in 8% LJFM group but the same condition was not seen when the eggs were scrambled and served.

Conclusion

Based on the results, it is concluded that the LJFM can be safely and economically added upto 8% level in commercial layer rations.

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Table 1

Percent Proximate composition, acid insoluble ash, calcium, Phosphorous content of leather jacket fish meal (LJFM) (%DM)

Composition	Leather jacket fish meal
Dry matter	88.50
Crude Protein	45.00
Crude Fibre	2.00
Ether Extract	4.20
Total Ash	26.00
Acid insoluble Ash	4.00
Nitrogen free extract	11.30
Calcium	6.50
Phosphorous	3.50

Table 2: Ingredient composition (% DM) of layer mash

Ingredients	Percent level of leather jacket fish meal inclusion in the ration				
	0.0	2.0	4.0	6.0	8.0
Maize	32.00	30.0	30.00	30.00	30.00
Rice	10.00	10.00	10.00	10.00	10.00
Bajra	13.00	15.00	15.00	15.00	15.00
Soya Bean Meal	25.00	24.00	21.00	20.00	17.00
Sunflower Deoiled Cake	5.00	3.00	4.00	3.00	4.00
Deoiled Rice Bran	4.40	6.50	7.00	7.00	7.40
Leather Jacket Fish Meal	0.00	2.00	4.00	6.00	8.00
Di Calcium Phosphate	1.60	1.50	1.00	1.00	0.60
Calcite	3.00	3.00	3.00	3.00	3.00
Shellgrit	6.00	5.00	5.00	5.00	5.00
Total	100.00	100.00	100.00	100.00	100.00
Vitamin AB2D3K (g)	10.00	10.00	10.00	10.00	10.00
B Complex (g)	25.00	25.00	25.00	25.00	25.00
Trace Minerals (g)	100.00	100.00	100.00	100.00	100.00

Table 3**Effect of feeding leather jacket fish meal (LJFM) in Layers on egg quality (22-30 weeks)**

Parameters	Per cent level of inclusion of leather jacket fish meal				
	0.0	2.0	4.0	6.0	8.0
Egg weight (g)**	46.08± 1.44	46.37±1.44	46.01±1.12	46.18±1.27	46.78±1.71
Albumen index *	0.12 ±0.01	0.12±0.02	0.11±0.02	0.11±0.02	0.13±0.03
Haugh Unit *	95.9±4.43	94.0±7.10	94.5±3.61	93.0±5.08	98.0±5.02
Yolk index*	0.48±0.02	0.49±0.05	0.48±0.02	0.46±0.04	0.49±0.02
Yolk Colour score*	3.0 ±1.26	3.0 ±0.70	3.0 ±1.39	4.0 ±0.83	3.0 ±0.83
Average shell thickness (mm)*	0.338 ±0.01	0.341±0.03	0.33±0.02	0.345±0.02	0.337±0.001

** - Mean of 560 observations / treatment * - Mean of 9 observations / treatment

Table 4

Effect of feeding leather jacket fish meal (LJFM) on organoleptic qualities of eggs
Cooking method: Hard Cooking

Treatment	Colour	Texture	Chewability	Flavour	Overall acceptance
T1(0% LJFM)	60	59	67	77	114
T2(2% LJFM)	63	65	73	72	113
T3 (8% LJFM)	69	56	66	68	106

Cooking method: Scrambled egg.

Treatment	Colour	Texture	Chewability	Flavour	Overall acceptance
T1 (0% LJFM)	76	67	78	81	140
T2(2% LJFM)	88	62	79	86	123
T3 (8% LJFM)	70	61	76	83	128