Research Article

REPLACEMENT OF GROUNDNUT OIL CAKE BY SUNFLOWER OIL CAKE AND ITS EFFECT ON AGE AT SEXUAL MATURITY AND 50% PRODUCTION IN QUAIL BREEDERS

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ABSTRACT

The biological trial of twenty-four weeks duration was carried out with 400 adult Japanese quails equally and randomly distributed into ten treatment groups of two replicates. All the quails were housed in multi-tier breeder cages up to thirty weeks of age. The quails in control group were fed corn-soya based diet with no multi-enzyme supplementation. Treatment groups were fed on diets containing 25, 50, 75 and 100 per cent levels of sunflower cake replacing the groundnut cake on an isolysine and isomethionine basis with no multi-enzyme supplementation and, similar treatment groups were fed with multi-enzyme supplementation. The age at sexual maturity was neither influenced by feeding different levels of SFOC nor by enzyme supplementation. The age at 50% production was influenced significantly (P<0.01) both by feeding different levels of SFOC and by enzyme supplementation.

Key Words: Japanese Quails, Sunflower Cake, Multi-Enzyme, Age at Sexual Maturity

INTRODUCTION

One of the critical inputs for commercial quail farming is cost effective day old quail chick. Feed is the major cost factor in the production of which protein is a crucial factor which determines the cost of feed and in turn the production performance. Sunflower oil cake is the cheaper alternate source of vegetable protein than groundnut oil cake and soya and, is also rich in fibre which limits its utilization but could be enhanced through enzyme supplementation. Hence, the present study was undertaken to analyse the effect of Sunflower oil cake on age at sexual maturity and age at 50% production of Japanese quails at different levels of its inclusion replacing the groundnut oil cake.

MATERIALS AND METHODS

The biological trial of twenty-four weeks duration (7-30 weeks) was carried out with 400 adult Japanese quails were equally and randomly distributed in to ten different treatment groups (T0, T1, T2, T3, T4, T5, T6, T7, T8 and T9) of two replicates belonging to the same age. All the quails were housed in multi-tier Japanese quail breeder cages and standard feeding and other management practices were followed. The per cent ingredient and nutrient composition of the starter and layer diet for treatment groups are furnished (Table 1). Groundnut oil cake was utilized as a major source of vegetable protein in the control diet which was replaced by sunflower oil cake at graded levels on isolysine (1.3%) and isomethionine (0.5%) basis according to NRC standards (1977). The dietary treatments were control – T0 corn GNC based diet T1, T2, T3, T4 were 25, 50, 75 and 100 per cent replacement of GNC by SFOC T5 corn GNC based diet with multi enzyme, T6, T7, T8, T9 were 25, 50, 75 and 100 per cent levels replacement of GNC by SFOC with multi enzyme supplementation. Feeding was carried out up to thirty weeks of age. Data on age at sexual maturity, age at 50% egg production, egg weight and egg mass were recorded and subjected to analysis of variance as per Snedcor and Cochran (1989).

RESULTS AND DISCUSSION

The age at sexual maturity, age at 50% egg production, egg weight and egg mass as influenced by feeding different levels of SFOC with or without enzyme supplementation are presented in Table 2. *Age at sexual maturity:* Irrespective of the enzyme supplementation, when the groundnut oil cake was replaced by 0, 25, 50, 75 or 100 per cent level, the age at first egg ranged from 44.25 ± 4.25 to 49.50 ± 4.50 days. This is in agreement with reports of Tugay *et al.*, (2006) and Arumugam (2008).

Sr.	Ingredients	Control		25%		50%		75%		100%		
No.												
		0-6 wks	7-30 wks									
1	Maize	50	57	50	57	50	57	50	57	50	57	
2	Deoiled GNC	30	24	22.5	18	15	12	7.5	6	-	-	
3	SFOC	0	-	7.5	6	15	12	22.5	18	30	24	
4	Soyabean meal	8	5	8	5	8	5	8	5	8	5	
5	Fishmeal	10	8	10	8	10	8	10	8	10	8	
6	Shell grit		4		4		4		4		4	
7	Mineral mixture	2	2	2	2	2	2	2	2	2	2	
8	Vitamin mixture	0.1	-	0.1	-	0.1	-	0.1	-	0.1	-	
9	Total	100	100	100	100	100	100	100	100	100	100	
10	CP (%)	25.20	21.06	24.38	20.40	23.55	19.74	22.73	19.08	21.90	18.42	
11	ME (Kcal/kg)	2802	2775	2789	2765	2776	2755	2763	2745	2751	2735	
12	Calcium%	-	2.62	-	2.63	-	2.63	-	2.64	-	2.65	
13	Phosphorus	-	0.377	-	0.387	-	0.396	-	0.406	-	0.415	
14	E/P ratio	111.19	131.76	114.40	135.53	117.89	139.56	121.59	143.86	125.61	148.47	

Table 1: Composition of the ration

The composition of T5 to T9 diets were similar to T0 to T4 respectively except for the addition of 500 gm of enzyme mix per tonne of feed the enzyme contained cellulase 2000, hemicellulase 2500, glucosidase 245, pectinase 850 protease 48000 and amylase 11000 IU per gram

Table 2: Performance of quails

	T0	T5	Pooled	T1	T6	Pooled	T2	T7	Pooled	T3	T8	Pooled	T4	T9	Pooled
Age at first	50.50	44.00	47.25	44.00±	51.50	47.75	44.00	49.00	46.50	42.50	46.00	44.25	49.50	49.50	49.50
egg (days) ^{NS}	±7.50	±3.00	±5.25 ^a	5.00	±4.50	±4.75 ^a	±1.00	±7.00	±4.00 ^a	±3.50	±5.00	±4.25 ^a	±5.50	±3.50	±4.50 ^a
Age at 50%	61.50	61.00	61.25	55.50±	59.50	57.50	58.50	61.00	59.50	57.00	61.00	56.50	53.50	57.50	55.50
production	±1.50	±0.03	$\pm 0.76^{\circ}$	0.50	±1.50	$\pm 1.00^{ab}$	±0.50	±5.00	±2.75b ^c	± 1.00	± 5.00	$\pm 4.00^{a}$	± 5.50	±0.78	±3.14 ^a
(days) **															

Means bearing the same superscript within classes do not differ significantly.

** (P<0.01).

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Research Article

It was also observed that any level of replacement of groundnut oil cake with SFOC did not have any significant effect on the age at sexual maturity. When the GNC was replaced with enzyme supplemented SFOC at different levels the age at first egg ranged from 44.00 ± 3.00 to 51.50 ± 4.50 days with a mean of 48.00 ± 1.33 days.

Age at 50% production: Irrespective of the enzyme supplementation when the groundnut oil cake was replaced by 0, 25, 50, 75 or 100 per cent level, significant variation in the age of 50% production was observed. The 50 % production was attained by the birds on 61.25 ± 0.76 days when the diet is devoid of SFOC. However, the age at 50% production was significantly reduced (P<0.01) when the groundnut oil cake was replaced at 25 % level and remain the same up to 50% replacement. Further, the age at 50% production was still lowered significantly when the GNC was replaced at 75%. The age at 50% production varied from 57.00 ± 1.00 to 61.50 ± 1.50 days with a mean of 57.20 ± 1.36 when the GNC was replaced at different levels of SFOC without enzyme supplementation and varied from 56.00 ± 7.00 to 61.00 ± 0.03 days with a mean of 59.00 ± 0.99 days when the GNC replaced at different levels of SFOC with enzyme supplementation. This is in agreement with the findings of Bhanja *et al.*, (2006) and Arumugam (2008).

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