

**Research Article**

## **INFLUENCE OF SUNFLOWER CAKE INCLUSION ON AGE AT SEXUAL MATURITY AND AGE AT 50% PRODUCTION IN JAPANESE QUAIL BREEDERS**

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### **ABSTRACT**

The biological trial was carried out with 230 adult Japanese quails from 7-30 weeks of age. The birds were 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 protein mix consisting of 60% groundnut cake and 40% DORB on an iso-lysine and iso-methionine basis with no multi-enzyme supplementation and, similar treatment groups were fed with multi-enzyme supplementation. The age at sexual maturity was not influenced by feeding different levels of SFOC but was significantly influenced by enzyme supplementation. The age at 50% egg production was neither significantly influenced by enzyme supplementation nor by feeding different levels of SFOC.

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

### **INTRODUCTION**

Japanese quail, a small domesticated avian species has assumed importance throughout the world as bird and is commercially exploited for egg and meat production. The major input cost is the feed cost which accounts for nearly 75% of the total cost. This is due to continuous increase in the cost of feed ingredients. Such an unparalleled escalation in the feed cost is threatening to the rapid development of quail industry, and necessitates reduction in the feed cost by finding out alternate feed ingredients which are cheaper than the prime ingredients. Sunflower oil cake is the cheaper 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. Therefore, the present study was undertaken to analyse the influence of Sunflower oil cake on age at sexual maturity and age at 50% production in Japanese quails at different levels of its inclusion replacing the protein mix at various levels.

### **MATERIALS AND METHODS**

The biological trial of twenty-four weeks duration (7-30 weeks) was carried out with 230 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). A protein mixture consisting of 60% groundnut oil cake and 40% de-oiled rice bran was prepared and used as major protein source (31.4%) in the control diet (T0) which was replaced by sunflower oil cake at graded levels on iso-lysine (1.3%) and iso-methionine (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 protein mix 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 protein mix by SFOC with multi enzyme supplementation. Feeding was carried out up to thirty weeks of age. Data on age at sexual maturity and age at 50% production were recorded and subjected to analysis of variance as per Snedcor and Cochran (1989).

## Research Article

### 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.

**Table 1: Composition of the ration**

S. No.	Ingredients	Control		25%		50%		75%		100%	
		0-6 wks	7-30 wks	0-6 wks	7-30 wks	0-6 wks	7-30 wks	0-6 wks	7-30 wks	0-6 wks	7-30 wks
1	Maize	40	47	40	47	40	47	40	47	40	47
2	Protein mix	38	34	28.5	25.5	19	17	9.5	8.5	-	-
3	SFOC	-	-	9.5	8.5	19	17	28.5	25.5	38	34
4	Soyabean meal	10	5	10	5	10	5	10	5	10	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 (%)	24.23	20.51	24.29	20.56	24.34	20.61	24.40	20.66	24.40	20.72
11	ME (Kcal/kg)	2647	2612	2646	2611	2645	2611	2644	2610	2643	2609
12	Calcium%	-	2.623	-	2.640	-	2.658	-	2.675	-	2.693
13	Phosphorus	-	0.371	-	0.389	-	0.407	-	0.425	-	0.444
14	E/P ratio	109.24	127.35	108.93	126.99	108.66	126.68	108.36	126.33	108.31	125.91

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 egg (days) <sup>NS</sup>	43.50 ±0.50	47.00 ±1.00	45.25 ±0.75 <sup>a</sup>	45.50 ±0.50	46.00 ±2.00	45.75 ±1.25 <sup>a</sup>	45.50 ±1.50	44.50 ±0.50	45.50 ±1.00 <sup>a</sup>	44.50 ±0.50	44.50 ±0.50	44.50 ±0.50 <sup>a</sup>	43.50 ±0.50	45.00 ±1.00	44.25 ±0.75 <sup>a</sup>
Age at 50% production (days) <sup>NS</sup>	55.50 ±0.50	54.50 ±0.50	55.00 ±0.50 <sup>a</sup>	53.50 ±0.50	54.50 ±1.50	54.00 ±1.00 <sup>a</sup>	55.00 ±1.00	54.50 ±1.50	54.75 ±1.25 <sup>a</sup>	52.50 ±0.50	54.50 ±1.50	53.50 ±1.00 <sup>a</sup>	54.50 ±0.50	54.50 ±1.50	54.50 ±1.00 <sup>a</sup>

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

\* ( $P < 0.05$ ), \*\* ( $P < 0.01$ )

## Research Article

### Age at Sexual Maturity

Irrespective of the enzyme supplementation, when the protein mix was replaced by SFOC at 0, 25, 50, 75 or 100 per cent level, the age at sexual maturity have significant effect ( $P < 0.05$ ). The age at first egg ranged from  $43.50 \pm 0.50$  to  $45.50 \pm 0.50$  days with a mean of  $44.50 \pm 0.44$  days when the SFOC was not supplemented with enzyme supplementation. Upon enzyme supplementation, when the protein mix was replaced with enzyme supplemented SFOC at different levels the age at first egg ranged from  $44.50 \pm 0.50$  to  $47.00 \pm 1.00$  days with a mean of  $45.40 \pm 0.48$  days. Enzyme supplementation of SFOC significantly increased the age at first egg from  $44.50 \pm 0.44$  to  $45.40 \pm 0.48$  days. It was also observed that any level of replacement of protein mix with SFOC did not have any significant effect on the age at sexual maturity. This is in close agreement with the reports of Bhanja *et al.*, (2006) and Sangilimadan *et al.*, (2012).

### Age At 50% Production

Irrespective of the enzyme supplementation when the protein mix was replaced by 0, 25, 50, 75 or 100 per cent level, did not have any significant variation in the age of 50% production. The age at 50% production varied from  $52.50 \pm 0.50$  to  $55.50 \pm 1.00$  days with a mean of  $54.20 \pm 0.53$  when the protein mix was replaced at different levels of SFOC without enzyme supplementation. When the enzyme supplemented SFOC replace the protein mix at different levels the average at 50% production was  $54.50 \pm 0.10$  days. It was also observed that any level of replacement of protein mix with SFOC had no significant effect on the age at 50% production. This is in close agreement with the reports of Bhanja *et al.*, (2006) and Sangilimadan *et al.*, (2012).

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