

Original Research Article

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## To Economize the Feed Cost of Broiler Japanese Quail (*Coturnix coturnix japonica*) by Feeding Fish Silage

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### ABSTRACT

The present day Indians prefer quail meat due to low cholesterol and fat content than that of other poultry meats. One hundred ninety two (192) 7days old broiler quail chicks of either sex were taken for the study. The chicks were weighed and randomly distributed into four dietary treatments with four replicates in each group having twelve (12) chicks in each replicate. The dietary treatments were: T<sub>1</sub> - control diet; T<sub>2</sub>- diet containing 5% fish silage and T<sub>3</sub>-diet containing 10% fish silage and T<sub>4</sub> - diet containing 15% fish silage. The cost of experimental diet per kg fed to the birds during the period of experiment was estimated to be Rs 29.11 (T<sub>1</sub>), 28.52(T<sub>2</sub>), 28.10 (T<sub>3</sub>) and 27.72(T<sub>4</sub>). The cost of feed per kg of weight gain was the lowest in T<sub>2</sub> (Rs.99.88) while it was highest in case of T<sub>3</sub> (Rs 121.62). Therefore, it is concluded that AFS can be included at 5% level in the diet of broiler Japanese quails to economize the feed cost.

#### Keywords

Fish silage,  
Economization,  
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### Introduction

Quail farming is in demand in the present days as quails are hardy, easy to handle and can accommodate to various agro climatic regions which again suits to the requirements of Indian farmers. The health conscious consumers of modern Indian societies also prefer quails as a source of lean meat having

relatively low fat and cholesterol than that of other poultry meat. The low floor space requirement of quail encourages the small or marginal farmers for quail farming. According to Livestock census (2012) the quail population of India has shown a marked increase. The concept of fish silage first came from Sweden in the year 1930 followed by Denmark making the first commercial fish

silage production in 1940 (FAO, 2016). Fish silage basically is a liquid product made from either whole fish or parts of fish that are liquefied by action of enzymes in the fish in the presence of an added acid. The enzymes breakdown the fish proteins into smaller soluble units and the acid help to speed up their activity while preventing bacterial spoilage (FAO, 2016). It can be prepared by ensiling the fish waste either by addition of organic and inorganic acids which is also known as acid treated or chemical silage or by addition of a carbon source and *Lactobacilli* bacteria for lactic acid fermentation also known as fermented or biological fish silage (Ramirez *et al.*, 2013). The acid treated silage is considered to be better than that of the fermented one because of a lower cost of production involved. Taking both cost and quality, formic acid is the acid of choice for preparation of acid treated silage.

### **Materials and Methods**

One hundred ninety two (192) 7day old broiler quail chicks of either sex, were taken for the study. The chicks were weighed and randomly distributed into four dietary treatments with four replicates in each group having twelve (12) chicks in each replicate. The experiment was carried out for a period of 4 weeks.

The dietary treatments were: T<sub>1</sub> - control diet; T<sub>2</sub>- diet containing 5% fish silage and T<sub>3</sub>-diet containing 10% fish silage and T<sub>4</sub> - diet containing 15% fish silage.

The chicks were fed with iso-caloric and iso-nitrogenous diet from 7<sup>th</sup> to 35<sup>th</sup> day of life. The chicks under treatment groups were provided with prescribed incorporation of fish silage from 7<sup>th</sup> to 35<sup>th</sup> day of life. During the period of study all the birds were given with a balanced diet having 2905 Kcal of ME/Kg of ration and 23.9% C.P. approximately. The

ingredients and the nutrient composition are presented in Table 2 and 3.

The data pertaining to various parameters were subjected to statistical analysis under completely randomized design employing one way analysis of variance (Snedecor and Cochran, 1989). The means of different treatments were compared with Duncan's multiple range test (Duncan, 1955). Significance was considered at  $p < 0.05$  level.

### **Results and Discussion**

The cost of feed per kg live weight gain and the feed cost per bird are given in Table 4. The cost of experimental diet per kg fed to the birds during the period of experiment was estimated to be Rs 29.11 (T<sub>1</sub>), 28.52(T<sub>2</sub>), 28.10 (T<sub>3</sub>) and 27.72(T<sub>4</sub>). The cost of feed per kg of weight gain was the lowest in T<sub>2</sub> (Rs.99.88) while it was highest in case of T<sub>3</sub> (Rs 121.62). However there was a difference of Rs 2.94 between T<sub>1</sub> and T<sub>2</sub> which shows that diet with 5% fish silage was more economical on weight gain basis.

The feed cost per kg live weight gain was lowest in T<sub>2</sub> (5% AFS) with a value of Rs 99.88, which could be attributed to the low cost of feed due to dietary incorporation of fish silage. This finding was in agreement with those of Boitai (2015) and Vedhanayakam *et al.*, (1976) who reported lower cost of production due to dietary incorporation of AFS in broiler chicken. The cost of feed per kg weight gain in case of T<sub>3</sub> was highest being higher than that of control, which could be due to comparatively higher FCR (4.33). Darsana *et al.*, (2009) observed a reduction of Rs 0.50 per kg feed due to replacement of fish silage with fish meal in broiler diet causes without affecting overall performance. Dietary inclusion of AFS at 5% level in broiler quail chicks reduced the feed cost by Rs 2.94 per kg live weight gain when

compared to that of the control. Although a reduction in body weight gain (12.12 g) was observed in broiler quails due to dietary incorporation of 5% AFS in the present study,

an improvement in FCR amounting to saving of Rs 2.94 per kg live weight gain was observed.

**Table.1** Design of the experiment

Treatment no.	Treatment	No. of quail chicks
<b>Control group(T<sub>1</sub>)</b>	Control Diet	48
<b>T<sub>2</sub></b>	Diet with 5% fish silage	48
<b>T<sub>3</sub></b>	Diet with 10% Fish silage	48
<b>T<sub>4</sub></b>	Diet with 15% Fish silage	48

**Table.2** Formulation of fish silage with 0%, 5%,10% and 15% Fish silage

SI. No	Ingredients (Parts/quintal)	Control diet	Diet with 5% fish silage	Diet with 10% fish silage	Diet with 15% fish silage
<b>1</b>	<b>Maize</b>	58.1	53	51	47.9
<b>2</b>	<b>Fish silage</b>	-	5	10	15
<b>3</b>	<b>Deoiled rice bran</b>	-	3.05	3.2	3.9
<b>4</b>	<b>Deoiled soya meal</b>	38.5	35.1	32.2	29.5
<b>5</b>	<b>Choline chloride 50%</b>	0.12	0.12	0.15	0.15
<b>6</b>	<b>Salt</b>	0.2	0.25	0.25	0.25
<b>7</b>	<b>Sodium bicarbonate</b>	0.2	0.2	0.2	0.2
<b>8</b>	<b>Calcite powder (Ca=34%)</b>	1.34	1.4	1.25	1.25
<b>9</b>	<b>Dicalcium phosphate</b>	1.28	1.6	1.56	1.56
<b>10</b>	<b>ABDK vitamin</b>	0.025	0.025	0.025	0.025
<b>11</b>	<b>DL-Methionine</b>	0.12	0.13	0.13	0.14
<b>12</b>	<b>B-complex</b>	0.03	0.025	0.025	0.025
<b>13</b>	<b>Mineral mixture</b>	0.12	0.12	0.12	0.12
	<b>TOTAL</b>	<b>100.035</b>	<b>100.02</b>	<b>100.11</b>	<b>100.02</b>

Composition: Each 1 kg Trace min-CB contains Manganese: 90g, Zinc: 80g, Iron: 90g, Copper: 15g, Iodine: 2g, Selenium: 300 mg.

\*5kg fish silage (20 kg liquid silage), 10kg fish silage (40 kg liquid silage), 15 kg fish silage (60kg fish silage)

**Table.3** Calculated values of different feeding treatments

Calculated value	Diet with 0% Fish silage	Diet with 5% Fish silage	Diet with 10% Fish silage	Diet with 15% Fish silage
ME (Kcal/Kg)	2905	2925	2924	2940
CP%	23.9	23.83	23.85	23.69
CF%	-	-	-	-
Lysine(%)	1.26	1.28	1.29	1.28
Methionine(%)	0.35	0.5	0.51	0.51
Calcium(%)	0.9	0.9	0.91	0.92
Phosphorus(%)	0.42	0.43	0.44	0.44

**Table.4** Economics of production

Particulars	T <sub>1</sub> (Control diet without fish silage)	T <sub>2</sub> (Diet with 5% fish silage)	T <sub>3</sub> (Diet with 10% fish silage)	T <sub>4</sub> (Diet with 15% fish silage)
Cumulative body weight gain (g)	123.10	110.98	80.25	70.01
Cumulative feed consumption(g)	434.19	391.97	347.35	288.66
Cumulative FCR	3.53	3.53	4.33	4.12
Cost of feed/ bird (During experimental period)	Rs 12.64	Rs 11.17	Rs 9.76	Rs 8.00
Cost of feed / kg weight gain	Rs.102.82	Rs.99.88	Rs.121.62	Rs.114.31

In conclusion, acid Treated Fish Silage can be included at 5% level in the diet of broiler Japanese quails to economize the feed cost. This can help in economizing the cost of production for commercial quail farms and for the farmers at village level.

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