

## **INFLUENCE OF DIFFERENT LEVELS OF DIETARY GARLIC ON CARCASS CHARACTERISTICS AND ORGANOLEPTIC PROPERTIES OF COOKED MEAT OF JAPANESE QUAILS**

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**Abstract:** A biological experiment was conducted by adding garlic at 0, 0.5, 1.0 and 1.5 per cent level in the basal diet of Japanese quail for a period of 4 weeks to assess the carcass characteristics and organoleptic properties of cooked meat. The results of the experiment revealed that dietary inclusion of garlic had no significant difference on carcass characteristics and organoleptic properties except flavour and overall acceptability which showed highly significant difference ( $P < 0.01$ ) at 1.5 per cent level than control group.

**Keywords:** Garlic, Eviscerated weight, Organoleptic properties, Japanese quails.

### **INTRODUCTION**

The fast growing nature of Japanese quails and their short generation interval has been associated with the use of antibiotic growth promoters in poultry feed in order to improve the quality of the product. Although birds raised with these feed additives achieved good performance, their potential side effects became a real public health problem. During the last decades, phytobiotics, probiotics and prebiotics have witnessed an increased application in modern poultry industry to problems emerging from the use of nutritional antibiotics and general antibiotic resistance. Garlic contains fructooligosaccharides (FOS) with prebiotic activity. Moreover, garlic powder contains various levels of allicin which is rich in vitamin content (vitamin C, thiamine, riboflavin and niacin), selenium and potassium. The addition of garlic powder to the feed of Japanese quails has a beneficial effect on their growth and meat performance.

### **MATERIALS AND METHODS**

A biological experiment was conducted by using 240 day old Japanese quail chicks belonging to single hatch. These chicks were randomly grouped into 4 treatments with 6

replicates of 10 chicks each. All the birds were reared under standard managerial practices up to four weeks of age.

The locally available garlic was purchased, powdered and incorporated into the standard Japanese quail diet to form different experimental diets. The treatment groups of the experiment were as follows:

| Treatment groups | Particulars                                 | Number of replicates per treatment | Number of birds per replicate | Total number of birds per treatment |
|------------------|---|------------------------------------|-------------------------------|-------------------------------------|
| T <sub>1</sub>   | Basal diet                                  | 6                                  | 10                            | 60                                  |
| T <sub>2</sub>   | Basal diet + 5 g Garlic powder/ kg of diet  | 6                                  | 10                            | 60                                  |
| T <sub>3</sub>   | Basal diet + 10 g Garlic powder/ kg of diet | 6                                  | 10                            | 60                                  |
| T <sub>4</sub>   | Basal diet + 15 g Garlic powder/ kg of diet | 6                                  | 10                            | 60                                  |
| <b>Total</b>     |   |                                    |                               | <b>240</b>                          |

Throughout the study period of 4 weeks, data on daily feed consumption, weekly body weight and mortality were recorded and at the end of study period, two birds from each replicate (one male and one female) were slaughtered for carcass characteristics and organoleptic properties. The data collected were subjected to statistical analysis as per the method suggested by Snedecor and Cochran (1989). Angular transformation was applied to percentages wherever needed before carrying out statistical analysis.

## RESULTS AND DISCUSSION

The mean per cent eviscerated weight and organoleptic properties of cooked meat of Japanese quails reared from one to four weeks of age as influenced by dietary supplementation of garlic are presented in Table I and II, respectively.

The analysis of variance of data revealed that there was no significant difference in the per cent eviscerated weight between the treatment groups. But in the garlic supplemented groups, it was noticed that the eviscerated weight was better in T<sub>2</sub> (69.39 %) group followed by T<sub>3</sub> (69.59 %) and T<sub>4</sub> (69.84 %) groups which had numerically higher per cent eviscerated weight than the control group T<sub>1</sub> (69.12 %).

The sensory evaluation characters colour, tenderness, juiciness and mouth coating of cooked Japanese quail meat revealed no significant difference between treatment groups whereas flavour and overall acceptability in the garlic treated groups showed highly significant difference ( $P < 0.01$ ) compared to the control group.

The results were in accordance with finding of Onibi *et al.* (2009); Abdullah *et al.* (2010), Fadlalla *et al.* (2010), Raessi *et al.* (2010), Amouzmehr *et al.* (2012), Issa and Omar (2012) and Elagib *et al.* (2013) who also recorded no significant difference in per cent eviscerated weight due to garlic supplementation.

Onibi *et al.* (2009) reported no significant difference in sensory evaluation of boiled broiler meat between control and treated groups, but the palatability of meat samples increased with increased levels of supplementary garlic in the diet.

### SUMMARY

It has been concluded that by supplementing different levels of dietary garlic to Japanese quails, the group T<sub>4</sub> (1.5 % garlic) had numerically higher eviscerated weight (69.84 %) compared to the rest of the treatment groups. Flavour of the garlic treated Japanese quail meat was appealing but other sensory characters showed no significant influence.

**Table I: Mean ( $\pm$  S.E.) eviscerated weight as percent live weight of Japanese quails reared up to four weeks of age as influenced by various levels of dietary garlic**

| Treatment groups | Eviscerated weight (%) |
|------------------|------------------------|
| T <sub>1</sub>   | 69.12 $\pm$ 1.18       |
| T <sub>2</sub>   | 69.39 $\pm$ 0.61       |
| T <sub>3</sub>   | 69.59 $\pm$ 0.18       |
| T <sub>4</sub>   | 69.84 $\pm$ 0.32       |

Value given in each cell is the mean of 12 observations

**Table II: Mean ( $\pm$  S.E.) organoleptic properties of cooked meat of Japanese quails reared up to four weeks of age as influenced by various levels of dietary garlic**

| Sensory Parameters    | T <sub>1</sub>               | T <sub>2</sub>                | T <sub>3</sub>                | T <sub>4</sub>               |
|-----------------------|------------------------------|-------------------------------|-------------------------------|------------------------------|
| Appearance            | 6.15 $\pm$ 0.26              | 6.28 $\pm$ 0.34               | 6.34 $\pm$ 0.29               | 6.22 $\pm$ 0.33              |
| Flavour               | 5.87 <sup>C</sup> $\pm$ 0.38 | 7.32 <sup>AB</sup> $\pm$ 0.21 | 7.46 <sup>AB</sup> $\pm$ 0.33 | 7.90 <sup>A</sup> $\pm$ 0.35 |
| Tenderness            | 6.33 $\pm$ 0.30              | 6.12 $\pm$ 0.23               | 6.45 $\pm$ 0.18               | 6.57 $\pm$ 0.28              |
| Juiciness             | 6.77 $\pm$ 0.22              | 6.33 $\pm$ 0.32               | 6.28 $\pm$ 0.27               | 6.68 $\pm$ 0.32              |
| Mouth coating         | 7.01 $\pm$ 0.33              | 7.12 $\pm$ 0.28               | 7.50 $\pm$ 0.30               | 7.43 $\pm$ 0.31              |
| Overall acceptability | 5.61 <sup>C</sup> $\pm$ 0.30 | 6.16 <sup>AB</sup> $\pm$ 0.33 | 6.56 <sup>AB</sup> $\pm$ 0.25 | 6.97 <sup>A</sup> $\pm$ 0.29 |

Value given in each cell is the mean of 6 observations

<sup>A-C</sup> Means within a column with no common superscript differ significantly (P<0.01)

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