

## **Study on Effect of Curry Leaves Supplementation with Broiler Feed on Growth Performance, Feed Intake and Feed Conversion Ratio of Broiler chicken**

W.W.H.A. Sampath , N.M.N. Nambapana  
*Uva Wellassa Univesity, Badulla, Sri Lanka*

*and*

G.A.P Ganegoda  
*CIC Feed (Pvt)Ltd, P.O.Box 2, No.252, Kurunduwatte Road, Ekala, Sri Lanka*

### **Introduction**

The broiler industry has developed all over the world during past few decades. When considering the production of 79.9 million broiler chicks in Sri Lanka in 2007, there is an increase in 2008, 2009 and 2010 years (Department of Animal Production and Health, 2010). The production of poultry meat and other poultry products have been drastically increased in Sri Lanka within last few years. The world broiler meat production in 2010 was 73 million metric tons (USDA-FAS, 2010). China, Brazil, European Union, Mexico are the main Broiler producers in the world (USDA-FAS, 2007). Poultry meat and other poultry products such as eggs, have a higher demand in Sri Lanka. When considering the consumption pattern of the meat in Sri Lanka, chicken meat (broiler meat) has the highest demand and broiler meat has been included in the gazette as an essential food item in Sri Lanka since 2007.

The requirement of nutrients for broilers is higher than the other livestock animals. Proper nutrition and the better intensive management practices are essentials in poultry industry. Hence feed cost is major cost component in poultry industry and it is accounted up to 60%-70% of the total cost of production. The production of feed in 2009 for poultry in Sri Lanka was 454,000 Mt. However the feed price has increased after 2008 and the profit margin of the industry has gone down (Department of Animal Product and Health, 2009).

To overcome this limitation in the industry, feed supplementation is done by the farmers/producers. The supplementation is done using low cost, available feed stuffs and without affecting the performance of birds and the quality of the meat. Performance of the animal can be increased by increasing the feed conversion by improving the internal environment modification. This can be achieved by inclusion of antibiotics into feed. Antibiotics are the chemicals those which antagonistic towards or destructive of life (The penguin encyclopedia of nutrition, 1985).

Some of other feed ingredients are used to restrict or avoid the usage of antibiotic growth promoters (AGPs). Some of those are probiotics, prebiotics, synbiotics, enzymes, acidifiers, antioxidants, phytogenic additives and herbal extracts (Pauline, 2009). The usage of natural plant based materials improves the feed intake, feed digestibility, feed conversion efficiency, the quality of the meat and reduce mortality (Hathurusinghe, 2008). Natural herbal materials increase colour lipid oxidation and reduce gut microbial content (Cross *et al.*, 2007). Essential oils, organic acids and phytogenic compounds enhance production of gastric secretions, stimulate blood circulation and reduce level of pathogenic bacteria (Buchaan *et al.*, 2008)

This study was done to investigate the effect of curry leaves incorporated broiler feed on growth performance and feed conversion ratio of broiler chicken under field condition in Sri Lanka. For the study, the dried, blended curry leaves supplementation was used. The study hypothesized that dietary supplementation of curry leaves has an ability to improve the health, performance and reduce the cost of production of broilers.

### **Methodology**

For the experiment, 99 day old male Hubbard flex chicks were divided into three treatment groups having 33 birds per each group. There were three treatments as control group who were fed with basal diet, 1% and 2% curry leaf supplementation respectively with basal diet. Brooding was practiced in first seven days by dividing only as treatment groups. Then each treatment group was divided into three replicates randomly in day 8<sup>th</sup> to 42<sup>nd</sup> of age. Initial body weights, weekly body weight and daily feed intake were measured during the experimental period.

Birds were provided ad libitum clean drinking water throughout the study except in vaccination protocol. Multi vitamin mixture (Vita light) was given with drinking water in first five days of the study and after vaccination. The birds were vaccinated with ND vaccine on 3<sup>rd</sup>, 14<sup>th</sup> day and Gumboro (Infectious Bursal Disease –IBD) vaccine on 14<sup>th</sup>, 21<sup>st</sup>, 28<sup>th</sup> day. Mortality and reasons for deaths were recorded throughout the period of study. During the brooding period (day 1 to 7), daily group feed intakes were recorded and weekly live body weights were measured on day eight. Following replication, body weights and feed intakes were recorded on replicate basis. In each replicate, daily feed intakes were recorded and weekly body weights were recorded on 8<sup>th</sup>, 15<sup>th</sup>, 22<sup>nd</sup>, 29<sup>th</sup>, 36<sup>th</sup>, and 42<sup>nd</sup> day. Average body weight gain and feed conversion ratio (FCR) were calculated using above measurements. Each variable was analyzed using Completely Randomized Design (CRD). Data were analyzed according to the General Linear Model (GLM) of ANOVA (Minitab 14). Three curry leaves samples were taken from three lots of curry leaf powder to prepare composite sample for the analysis. The curry leaves samples were subjected to sieve analysis and proximate analysis (crude protein, crude fat, crude fiber, moisture, and total ash).

### **Results and discussion**

Proximate analysis of the curry leave supplemented diet consisted moisture 21.98%, ash 9.92%, crude protein 6.10%, crude fat 1.00% and crude fiber 3.70%.

Results of weekly body weight gain, feed intake, FCR and Results of sieve analysis are given in Table 1 and Table 2 respectively. According to the sieve analysis 08  $\mu\text{m}$  and 16  $\mu\text{m}$  were the dominating particle size of curry leaf used in the experiment. According to results of experiment the body weight gain of chicks fed with curry leaves supplemented diets were higher ( $P < 0.05$ ) than the basal diet.

Final body weight gain of the birds fed basal diet was lower ( $P < 0.05$ ) than that of other two supplementary groups. These findings of the study agree with the observations of Hathurusinghe (2008) that states dietary herbal compounds improve the body weight gain and final body weight of broilers

The feed intake of chicks and FCR in curry leaves supplemented diets were lower ( $P < 0.05$ ) than that of basal diet but weight gains were high in curry leaves supplemented diets. There was no significant difference ( $P > 0.05$ ) between 1% and 2% curry leaves supplemented diets for weight gain, feed intake or FCR.

Table 1: Weekly body weight gain, feed intake, and FCR of broiler birds

Parameter	Period (days)	Basal diet-BD (Control)	BD + 1% Curry leaves	BD + 2% Curry leaves
Body Weight Gain (g)	1-7	144.87	159.61	150.58
	8-14	361.33	381.22	372.66
	15-21	769.33	788.66	772.51
	22-28	1293.80	1288.66	1292.00
	29-35	1828.68	1726.57	1788.00
	36-42	2028.71	2235.40	2247.31
Feed Intake (g)	1-7	125.26	116.72	116.88
	8-14	414.48	404.31	402.29
	15-21	955.14	927.56	921.65
	22-28	1711.11	1659.20	1644.89
FCR	29-35	2672.38	2567.24	2558.74
	36-42	3747.32	3589.94	3583.41
	1-7	0.64	0.55	0.58
	8-14	1.00	0.93	0.95
	15-21	1.16	1.10	1.12
	22-28	1.27	1.24	1.22
	29-35	1.42	1.44	1.39
	36-42	1.80	1.57	1.56

Table 2: Results of sieve analysis

Mesh Number ( $\mu\text{m}$ )	Curry leaves Powder (g)	Percentage
07	02	06.25
08	10	31.25
10	05	15.62
12	02	06.25
16	07	21.87
30	02	06.25
35	01	03.12
Bottom plate	03	09.37

### Conclusions

Dietary supplement of curry leaves into broiler feed significantly improves the Body Weight Gain (BWG) and decreases Feed Intake (FI) and Feed Conversion Ratio (FCR) in an effective manner. The current study revealed that the curry leaves can replace dietary antibiotics and since there was no significant difference between 1% and 2%

curry leaves supplementation on the BWG, FI and FCR, 1% curry leaf supplementation is adequate to be used in broiler industry. The study showed that there is a potential to add value to nationally available curry leaf plant through the broiler feed industry.

However, further studies are needed to investigate new phytogetic feed additives with more available herbals and medicinal plants in Sri Lanka.

### **References**

- Department of Animal Production and Health, Annual Report, 2009. Peradeniya, Kandy, Sri Lanka.
- Department of Animal Production and Health, Annual Report, 2010. Peradeniya, Kandy, Sri Lanka.
- USDA-FAS attach reports. 2010. Official statistics and results of Office Research, United States Department of Agriculture. USA.
- USDA-FAS attach reports. 2007. Official statistics and results of Office Research, United States Department of Agriculture. USA.
- The penguin encyclopedia of nutrition 1985. Penguin books Ltd, Harmondsworth, Middlesex, England.
- Pauline, G. 2009. Cyber extention: Antibiotics and the mode of action. (Accessed on 20.06.2011) Available at <<http://ezinearticles.com/?Antibiotics-And-The-Mode-Of-action> and id=1193644>
- Hathurusinghe, H.D.K.C. 2008. Potential use of selected herbs and spices as alternatives to antibiotics in broilers. Final year research project, Department of animal science, Faculty of Agriculture, University of Peradeniya.
- Cross, D.E., R.M. Devin, K. Hillman and T. Acamovic 2007. The effect of herbes and their associated oils on performance, dietary digestibility and gut microflora in chickens from 7 to 28 days of age. *Brit. Poult. Sci.* 48:496-506.
- Buchaan, N.P., J.M. Hott, S.E. Cultip, A.L. Rack and A. Asmer 2008. The effect of a natural antibiotic alternative and a natural growth promoter feed additive on broiler performance and carcass quality. *J. Appl. Poult.* 17:202-210.