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Effect of Wild Mint (*Mentha longifolia*) Infusion on the Over All Performance of Broiler Chicks

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Abstract: An attempt was made to evaluate the effect of aqueous extract of wild mint (*Mentha lngifolia*) on the overall performance of broiler chicks at NWFP Agricultural University, Peshawar in July 2005. Three levels of fresh wild mint infusion at the rate of 50, 40 and 30 mL L^{-1} of fresh drinking water were provided to chicks in groups A, B and C, respectively and group D was kept as control, each group was replicated four times with 10 chicks per replicate, reared for 35 days, in an open sided house in cages of the same size. No vaccination was practiced. Data were recorded daily for feed intake, water intake and for weight gain on weekly basis. Feed conversion efficiency, dressing percentage, percent mortality, weight of different body organs (breast, thigh and leg), giblets (liver, heart and gizzard), intestine and economics for each group was calculated at the end of experimental period. It was found that group B receiving 40 mL L^{-1} of wild mint infusion in drinking water had a significant ($p<0.05$) effect on mean body weight gain, feed intake, water intake, feed conversion efficiency, dressing percentage and weight of different body organs (breast, thigh and leg). Significant ($p<0.05$) differences were also found in mortality, highest mortality was observed in group D (10%) as compared with groups A, B and C, however there was no significant effect on giblets (liver, heart, gizzard), intestine and weight of abdominal fat. Mean feed cost and gross return was significantly ($p<0.05$) effected for group B. Feed cost was lower and gross return was significantly ($p<0.05$) higher for group B than other treated groups and control.

Key words: Habek mint infusion, growth performance, mortality, cost, broilers

INTRODUCTION

Feed is the major segment of cost of production in poultry industry. Efforts have been made since the very beginning of poultry industry to increase the efficiency of feed utilization to minimize per unit cost of production. In view of the ban on antibiotic that were previously and still in most of developing countries are used as growth promoters, poultry scientists today are challenged to find out new alternatives to these synthetic growth promoters that could be as or more effective to keep the poultry gut healthy and well balanced with normal micro flora that is recognized as a fundamental precondition for cost efficient and environmentally sound poultry production. Medicinal plants and herbs found in nature are mostly utilized for treatment and curative purposes by human beings since long. The active constituents in leaves, stem, seeds and roots barks of these medicinal plants are highly effective to combat different diseases and to improve the digestion, that in turn could improve the performance of the recipients.

Wild mint (*Mentha longifolia*) known as horse or habek mint, is often used in domestic herbal remedy, being valued especially for its antimicrobial, antiseptic, antispasmodic, choleretic, carminative and central nervous system stimulant properties and its beneficial effects on the digestion (Chopra *et al*., 1986). The major compounds are carvone (67.3%), limonene (13.5%), I, 8-cineole (5.4%), menthone (2.9%), linalool (2.8%) and isomenthone (1.2%) that exhibit strong antibacterial and antioxidant activities (Younis *et al*., 2004) keeping in view the important medicinal properties of wild mint, a research study was conducted with the objective to evaluate the effect of different level of wild mint infusion as a natural growth promoter on the overall performance and economics of broiler production.

MATERIALS AND METHODS

This research study was conducted in Completely Randomized Design (CRD). One hundred and sixty day old broiler chicks were purchased from the local hatchery

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and were divided into four groups A, B, C and D for various treatments with four replicates per group and 10 birds per replicate that were reared in cages in an open sided house, provided with feeders, drinkers, electric bulbs and sand was used as bedding material. Strict sanitation practices were maintained in the house before and during the course of experiment. Group A, B and C was given wild mint infusion at the rate of 50, 40 and 30 mL L^{-1} of drinking water, respectively, while group D was kept as control. Mean total body weight gain, feed intake, FCR and water intake were calculated and it the end of experiment dressing percentage, weight of different body organs, giblets, intestine and abdominal fat were also calculated. Computer package M STAT C was used to perform the data analysis using CRD design and comparison of mean was made by Duncan's multiple-range test (Steel and Torrie, 1980).

Preparation of wild mint infusion: Fresh wild mint leaves and bark were used to prepare an infusion according to the method described by Leila (1977). Hundred grams of fresh wild mint were taken in a non-metallic jar and 1 L of hot boiled distilled water were poured on it and was kept at room temperature for 5-8 h to prepare an infusion that were used on freshly basis.

RESULTS AND DISCUSSION

Body weight gain: Mean body weight gain was higher ($p<0.05$) for group B than the other three groups. No difference in the mean body weight gain of group A and C was observed, indicating that level of mint infusion used in these two groups have same influence mean body weight gain and were found better than control group D. The three level of infusion used in this study have shown increased body weight gain compared with control group D, but the best level that had highest effect was that of group B (Table 1). The findings of present study supporting the findings of Al-Ankari *et al.* (2004) who reported that wild mint (*M.longifolia)* inclusion to broiler diet resulted a significant increase in mean body weight gain. The findings of this experiment could also be correlated to the findings of Durrani *et al.* (2006) who reported that broiler diet containing medicinal plant (*Curcuma longa*) resulted in significantly higher weight gain as compared to control.

Feed intake: Mean feed intake was significantly ($p<0.05$) higher in group A than other groups and lower in group B (Table 1). The results of this study support the observations of Spirling and Daniels (2001) who reported that mint has a positive effect on digestion and can strongly affect feed intake. These results could also be supported by the findings of Mimica-Dukic *et al.* (1999) who reported that pharmacological properties of wild mint were resulted in increased intestinal motility, total bile secretion, hepatic anti oxidant status and feed intake in mice.

Water intake: No difference ($p<0.05$) in the mean water intake of group A, B, C and D was found however mean water intake by group A and B was significantly ($p<0.05$) higher than group C and D (Table 1).

Feed Conversion Ratio (FCR): Mean FCR value for group B was significantly ($p<0.05$) better than the rest of three groups. Mean FCR value for group A and D was indifferent. Improved FCR in group B was due to higher body weight gain and lower feed intake in this group that received mint infusion at the rate of 40 mL L^{-1} of water (Table 1). The findings of the present study are in agreement with Grieve (1981) and Chopra *et al.* (1992) they reported that wild mint has significant effect on the feed conversion efficiency in studies on animals. The findings of this study could be supported by the findings of Larson (1988) who reported that wild mint infusion significantly increased intestinal efficiency and give better feed conversion efficiency in mice. Brander (1985) reported that wild mint has antimicrobial properties and could be used as growth promoter; to improve feed utilization and weight gain in poultry bird.

Dressing percentage: Mean dressing percentage for group A, B, C and D was 57.94, 59.42, 58.44 and 58.01%, respectively, as shown in Table 2. Mean dressing percentage for group B was higher ($p<0.05$) than A, C and D.

Mortality: Percent mortality for groups A, B, C and D was 2.5, 2.5, 5.0 and 10%, respectively, as presented in Table 2. Mean percent mortality for group D was higher ($p<0.05$) (10%) than the rest of three groups while lower in group A and B. Guha *et al.* (1991) reported that herbal medicines show less mortality (2-3%) in treated groups than in non treated control group in chicks.

Weight of different body organs: Mean breast, leg and thigh weight for group B and C were significantly ($p<0.05$) higher than group A and D, while mean breast and thigh weight for group A were higher than group D as shown in Table 3. Mean leg weight for group B and C was significantly ($p<0.05$) higher than group A and D, while no significant difference was found between group A and D and B and C (Table 3).

Table 1: Mean values of body weight gain, feed intake, water intake and FCR among four groups

Groups	*M. longifolia* infusion L^{-1} of water (mL)	Mean body weight gain $chick^{-1}$ (g)	Mean body feed intake $chick^{-1}$ (g)	Mean water intake $chick^{-1}$ (mL)	Mean FCR value $chick^{-1}$
A	50	1192^{bc}	2666^{a}	6861^{a}	2.24^{b}
B	40	1315^{a}	2513^{c}	6839^{a}	1.91^{a}
C	30	1227^{b}	2607^{ab}	6540^{b}	2.12^{ab}
D	Control	1145^{c}	2581^{bc}	6568^{b}	2.25^{b}

Means in columns with different superscripts were significantly different at $\alpha = 0.05$

Table 2: Mean values of percent dressing and mortality among four groups

Groups	*M. longifolia* infusion L^{-1} of water (mL)	Mean dressing Percentage $chick^{-1}$	Percent mortality $group^{-1}$
A	50	57.94^{b}	2.5^{c}
B	40	59.42a	2.5c
C	30	58.44^{ab}	5.0^{b}
D	Control	58.01^{b}	10^{a}

Mean in column with different superscripts were significantly different at $\alpha = 0.05$

Table 3: Mean values of weight of different body organs among four groups

Groups	*M. longifolia* infusion L^{-1} of water (mL)	Mean breast weight $chick^{-1}$ (g)	Mean thing weight $chick^{-1}$ (g)	Mean leg weight $chick^{-1}$ (g)
A	50	246.0^{ab}	68.41^{ab}	60.66^{b}
B	40	275.3^{a}	73.33^{a}	66.92^{a}
C	30	286.8^{a}	74.41^{a}	69.42^{a}
D	Control	243.8^{b}	58.29^{b}	59.58^{b}

Means in columns with different superscripts were significantly different at $\alpha = 0.05$

Table 4: Mean values of giblet, intestine and abdominal fat weight among four groups

Groups	*M. longifolia* infusion L^{-1} of water (mL)	Mean liver weight $chick^{-1}$ (g)	Mean heart weight $chick^{-1}$(g)	Mean gizzard $chick^{-1}$ (g)	Mean intestine weight $chick^{-1}$(g)	Mean abdominal weight $chick^{-1}$(g)
A	50	37.25	6.92	23.58	98.75	28.83
B	40	40.66	7.58	25.66	95.17	26.83
C	30	41.58	7.75	23.83	97.50	24.58
D	Control	39.75	6.91	23.91	93.92	31.58

Means in columns with different superscripts were significantly different at $\alpha = 0.05$

Table 5: Mean values of feed cost and gross return $chick^{-1}$ among four groups

Group	*M. longifolia* infusion L^{-1} of water (mL)	Mean feed cost $chick^{-1}$ (Rs)	Mean Gross return $chick^{-1}$ (Rs)
A	50	38.57	82.17^{bc}
B	40	36.68	90.05^{a}
C	30	37.85	85.14^{b}
D	Control	37.41	79.82^{c}

Means in column with different superscripts were significantly different at $\alpha = 0.05$

Weight of giblets and abdominal fat: Mean weights of liver, heart, gizzard, intestine and abdominal fat were not altered ($p<0.05$) for group A, B, C and D as given in Table 4. These findings could be supported by the findings of Hernandez *et al.* (2004) who reported no difference in the mean weight of proventiculus, gizzard, intestine, liver and pancreas in broilers fed on two herbal plants extract. Our findings are also in accord to the findings of Elangovan *et al.* (1996) who reported that dietary treatment with herbal plant neem (alkali-treated) did not cause any pathological change in liver, heart, gizzard, intestine and no difference in the mean weight of these organs and abdominal fat.

Economics of experimental study feed cost: One objective of present study was to determine the feasibility of the wild mint (*M. longifolia*) infusion in broiler production in terms of feed cost and gross return. Mean feed cost per chick was Rs. 38.57, Rs. 36.68, Rs. 37.85 and Rs. 37.41 for group A, B, C and D, respectively, as Illustrated in Table 5. No significant ($p<0.05$) difference was found among wall treated groups for feed cost. Mean feed cost also included the cost of wild mint (*M. longifolia*) infusion used for groups A, B and C.

Gross return: Mean gross return per chick was Rs. 82.17, Rs. 90.05 Rs. 85.14 and Rs. 79.82 for group A, B, C and D, respectively, as presented in Table 5. Mean gross return for group B was significantly ($p<0.05$) higher than group A, C and D. The gross return for group D was significant ($p<0.05$) lower than the other groups.

Findings from the present study highlight the importance of wild infusion at the rate of 40 mL L^{-1} of drinking water during summer season made a significant

improvement in the overall performance and economics of broiler production. Further research work is needed to study its effects on meat quality, immunity and digestibility of broiler chicks and also in layers and breeders.

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