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SHORT COMMUNCATION

EFFECT OF HYDROPONIC MAIZE FODDER SUPPLEMENTATION ON PRODUCTION PERFORMANCE IN BROILERS

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SUMMARY

Hydroponic maize fodder is found as nutrient rich feed source for livestock and poultry. Under intensive system of broiler production, feeds account for 70-80% of the total cost of production. It was evident that inclusion of hydroponically grown cereal fodder in the poultry diet can reduce the cost on feeding in free range system. Present experiment was conducted to study the effect of inclusion of hydroponic maize fodder in the broiler poultry diet on growth rate and FCR. Day old broiler chicks were brooded together, given basal feed and vaccinated. At three weeks age, the chicks were divided into two groups. Group 1 was fed on 100% basal feed and group 2 fed on basal feed + 50 g hydroponic maize fodder. A low cost hydroponic fodder production devise was fabricated and utilized in the experiment for production of hydroponic maize fodder. 6.0 kg HMF was obtained from one kilogram of maize seed within 7 days without using any nutrients in the irrigated water. Nutritional profile of maize grain and fodder were analyzed using proximate analysis and found that The DM, CP, CF, EE, TA and NFE contents in HMF were 14.3 15.8, 12.62, 3.74, 3.27 and 64.57 respectively. Data on body weight, feed consumption and FCR was collected at weekly interval up to sixth week. The data was statistically analyzed using SPSS version 20. Body weight, Cumulative feed consumption and FCR in Group 1 and Group 2 were 2084.9±10.63 g, 3624±18.9 g, 1.74 and 2075.9±11.56 g, 3321±3.49 g, 1.60 respectively. The present study concluded that supplementation of hydroponic maize fodder in the broiler poultry diet reduce the feed cost by Rs. 10.36 per bird.

Key words : Hydroponic maize fodder, broiler, poultry diet

Poultry industry in India is constantly growing due to increase in consumption and generating employment. Under intensive system of broiler production, feed accounts for 80% of the total cost of production. Increase in demand for cereals, the cost of poultry feed is high resulting low net returns from broiler production. It is evident that sprouted grains have more nutritional value due to conversion of complex compounds to simpler and eliminate the effect of anti-nutritional factors. The sprouted grains have more protein value of gains by converting the protein polymers into amino acids and small peptides. The germination process improves lysine content and also activated enzymes and vitamins. Hydroponically grown maize fodder (HMF) is found as nutrient rich feed source of livestock. Inclusion of 23% of hydroponic barley fodder in Kuroiler diet increased the growth rate (Alinaitwe *et al.,* 2019). However, no information is available on supplementation of hydroponic maize fodder in boiler feed. Keeping this in view, present study was conducted to found the effect of hydroponic maize fodder supplementation on production performance in boilers.

The experiment was conducted in a commercial broiler farm at Manchal village of Ranga reddy district of Telangana (India) state for 21 days. The broiler chicks (vencobb-65) were kept for brooding for 21 days with complete vaccination and fed with broiler starter feed. At the age of 3 weeks, the birds were weighed for initial body weight and divided in to two groups consisting of 50 chicks in each group. The first group (T_1) fed with basal feed and another group (T_2) fed with basal feed along with 50 g (wet) hydroponic maize fodder per bird. Proximate analysis was done to determine the nutritive value of maize grains and hydroponic maize sprouts after 7 days. Initial data on body weight and body weights of chicks was recorded at weekly interval from 3rd to 6th week using electronic weighing balance. T-test and ANOVA was used for statistical significance of the data.

Production of hydroponic maize fodder

A low cost device was fabricated for production of hydroponic maize fodder at on site.

Clean seeds of maize (*Zea mays*) were soaked in tap water for 12 h and kept for sprouting in air tight condition for 36 h. The sprouted maize seed spread in the trays @ 1.5 kg/3.75 sft^{-1}. The first trays were on the top row and change every day to the lower rows replacing with new trays. The seedlings were allowed to grow for 5 days and on sixth day, entire fodder along with roots was removed. The fodder is then allowed to dry for 30 min and then cut into small pieces and mixed with basal feed.

The nutritive value of maize grain and Hydroponic maize fodder is given in Table 1. The results indicate that the nutritive value of HMF was found more nutritious than maize grain. The sprouting of maize grown up to 7 days resulted in increase of crude protein, ether extract, crude fiber and total ash content but decrease in carbohydrate was observed. The decrease in NFE content may be due to utilization for germination process as reported by Naik *et al.*, (2015). Similarly the digestibility of HMF also improved due to hydrolytic enzymes in the sprouting

TABLE 1
Nutritive value of hydroponic maize fodder and maize grain

Nutrient	Hydroponic maize fodder (8^{th} day after sprouting)	Maize grain
Dry matter	14.3	89.58
Crude protein	15.8	9.75
Ether Extract	3.74	2.93
Crude fiber	12.62	2.95
NFE	64.57	82.27
Total Ash	3.27	2.1

maize seed broke down the starch, protein and fat in to simple form of sugars, amino acids and fatty acids as reported by Sneath and Mclntosh (2003).

The mean weekly live weights of broiler chicks are presented in Table 2. Higher body weight at six weeks age and growth rate was observed in basal feed. It was also observed that the growth rate in T1 and T2 was 58.59 g/day and 58.35 g/day. From this study it is evident that inclusion of 25% HMF to the basal feed had partial affect on the growth rate of broiler chicken.

TABLE 2
Mean live weight of broiler chicken during experiment period

Age of the bird	T_1		T_2	
	Body weight (g)	Weight gain (g)	Body weight (g)	Weight gain (g)
3 weeks (initial data)	854.9±3.33	-	850.40±4.54	-
4 weeks	1356.6±5.29	501.7±2.42	1349.80±4.72	499.4±7.52
5 weeks	1875.7±4.29	519.1±3.59	1868.8±2.12	519.0±3.59
6 weeks	2084.9±10.63	209.2±9.51	2075.90±11.56	207.1±11.41

Mean cumulative feed intake and Feed conversion ratio (FCR) of broiler chicken during the experiment is presented in Table 3. The results revealed that the cumulative feed intake and FCR is high in T_1 compare to T_2. This indicated that inclusion of 25% HMF in basal feed reduced the feed intake and thereby low FCR value which reflected on saving of feed cost of Rs.10.36 per bird. The results are in accordance with the findings of Alinaitwe *et al.,* (2019) reported in Kuroilers that inclusion of sprouted barley fodder increase the growth rate and reduced the cost of per kilogram of chicken meat production.

CONCLUSIONS

The nutritive value of gains can be improved though sprouting. Low cost hydroponic devise developed by the Krishi vigyan Kendra, Yagantipalle can be effectively utilized for production of hydroponic maize fodder (HMF). The protein value in the maize grains increase up to 7 days and can be supplemented as feed to the poultry. Supplementation of 50 g of HMF per bird along with the basal feed did not affect the growth rate in broiler chicken. It also reduces the cumulative feed intake and feed conversion ratio. Inclusion of HMF decreases the cost of feeding in broiler chicken meat production. Further research is required to standardize the technology.

TABLE 3
Mean cumulative feed intake and FCR of broiler chicken during experiment

Age of the bird	T_1		T_2	
	Cumulative feed intake (g)	FCR	Cumulative feed intake (g)	FCR
4 weeks	1951.1±48.9	1.14	1746.3±35.24	1.29
5 weeks	2862.3±34.06	1.53	2527.0±32.33	1.35
6 weeks	3624.6±61.7	1.74	3321±30.31	1.60

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