Short Communication

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Morinda (Noni) fruits: Nutritional substitute in poultry production

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Backyard poultry farming is considered to be a profitable complementary enterprise in agriculture and constitutes an important activity for accelerating the tribal economy. Feed supplements in poultry production has significant role to improve the productivity of chicks. Now a day the food safety and security is more seriously considered than before. The medicinal plants and herbs have been used for many years in the treatment of various diseases in animals and human beings. The use of medicinal plants extracts in poultry for growth and immunity has been reported by many workers (Narimani-Rad *et al.*, 2011; Javed *et al.*, 2009). Now-a-days, medicinal plants extracts are used in animal feed as growth promoters. Due to prohibition of most of the antimicrobial feed additives in animal/ poultry feed and also due to their residual effects in animals/ poultry, plant extracts are becoming more popular. These feed additives act as antibacterial, antioxidant, anticarcinogenic, antifungal, analgesic, insecticidal, anticoccidial and growth promoters and these plant extracts compete with the synthetic drugs. Morinda commonly known as noni has a rich history in Ayurveda and grows widely throughout the coastal regions of many countries. Its fruit and leaves have been consumed as traditional foods in some area of Southeast Asia and in the Pacific islands. Reports suggested that the fruit has been used as a feed supplement for livestock and poultry (Sunder *et al.*, 2011). Mroinda commonly known as Noni, has been used for treatment of various kinds of illnesses and as a growth tonic in human being (Bruggnecate, 1992; Solomon, 1999). Morinda is a minor forest produce, it belongs to Rubiaceae family its Sanskrit name is 'Ayushka' means longevity. Phytodiversity in morinda is quite wide spread over species in the genus Morinda, Intra-species variation is also large. The species found in Gujarat especially in Panchmahal district is *Morinda tomentosa* locally known as 'Aledi'. It is found naturally growing in forest areas on the field's bund, road side and waste land mostly in Jambughoda, Halol, Kalol, Ghogamba, and Godhra Talukas of Panchmahal district. These talukas are tribal dominated. As tribal people depend on their surrounded natural resources for their day to day requirement like food, feed, fodder, fuel fiber, fragrant and phytomedicine. They use almost all parts of Morinda for different purposes viz. root paste is applied for antidote against venom of poisonous insects, its decoction is used to cure chronic skin diseases, leaves are used with worm oil for control of swelling and muscular pain, leaves ash is also made into paste in oil base and applied on wounds and boil, seeds are used as poultice. Its bark and wood are used to make yellow color. Kite festival is one of the very famous festivals of Gujarat among all communities. Most of the tribal people used Morinda barks to dye the kite thread. Its timber is used for making poles and pillars and handles of farm implements because of strong and light weight. Its fragrant and beautiful flowers are offered to God and used to decorate the houses. Villagers of these areas eat ripened Morinda (Aledi) fruits. In view of importance of Morinda (Noni), the study was conducted to find out the effect of Morinda (Noni) dried fruits powder as feed supplementations on growth and health performance of poultry chicks under backyard system of rearing.

An experiment was conducted at KVK, Panchmahals under the semi- arid condition of Gujarat, India, to assess the effect of Noni fruit (Morinda) supplementation on growth of poultry chicken under backyard rearing system. Forty Pratap Dhan chicken chicks of two week of age were randomly distributed equally in two groups i.e. Chicks of T1 (Control group) were maintained under backyard with basal diet and T2 (Morinda feed supplementation group) Chicks were maintained under backyard with basal diet plus 2 percent dried morinda fruit powder. Commercial maize-rice based standard poultry feed were used as basal ration. The herbal based feed supplementation was prepared by using dried ripped morinda fruit powder and mixed with commercial poultry feed. The birds were fed *ad libitum* and provided with plentiful clean drinking water. No medication and deworming were given throughout the experiment. The given flocks are being monitored by the KVK personals for proper maintenance of health of birds. The birds were reared under back yard management system throughout the entire periods of study. Individual body weight was recorded at two week intervals. The data pertaining to various parameters were calculated and analyzed as advocated by Sendecor and Cochran, 1994.

The data regarding mean body weight of poultry chicken at 2 to 20 weeks of age are presented in Table 1. It is evident from the results that feeding of dry ripened fruit powder of *Morinda tomentosa* with basal diet was found very effective to enhance the body weight and reduced the mortality. It is due to the higher nutritive value of Noni fruit and developed the immunity against the common diseases of the poultry chicks. It was observed that the body weight of 4

weeks old chicks was found to be 261.77 ± 6.39g in the *Morinda* fed group while it was recorded 252.41 ± 7.44g under control group. At the age of 20 weeks, the body weight of poultry chicks was recorded 1756.19 ±56.37and 1416.32 ± 0.028g in group T1and group T2, respectively. The body weight in group T2 was higher as compared to control group. The average age at first egg laying in Pratap Dhan chickens under morinda supplementation and control group was recorded 151.49±1.10 and 167.36±2.13 days, respectively. It seems that Morinda fruits are very effective in terms of anti oxidants and nutrients (vitamins, mineral and other nutrition's) Sodhi, 2011 reported that noni fruits contained 150 nutraceuticals and other medical activities constitutes including enzymes, alkaloids, phyto nutrients, minerals and vitamins which might have been responsible for enhancing the body weight of poultry chicks.

Observations were also recorded on the percentage of mortality rate during the course of the study. The mortality in chicken during the period from 6 to 20 weeks and 21 to 40 weeks of age was recorded 12.60 and 5.32 and 7.33 and 2.71 per cent, respectively. However, there was no mortality after 40 weeks of age. it may be due to the development of immunity power in the body of chicks. An immune modulatory polysaccharide rich substance from the fruit juice of Morinda has also been reported by Hirazummi and Fuussasawa (1999). Lata *et al*., (2009) also reported that dry fruits powder of *Morinda citrifolia* were very effective for production, reproduction and health of poultry.

It may be concluded that feeding of 2 percent dried morinda fruit powder with basal diet was very effective to enhance the body weight and to develop the immunity against the common diseases of poultry chicks. Birds are healthy and more productive with feeding dried *Morinda* fruits powder and people readily accepted this new intervention because *Morinda* is well known plants and easily accessable.

Table 1: Effect of Noni fruit supplement on performance of poultry chicks.

Parameters	Group I (control)	Group II (NFS*)
	Overall	Overall
2 week body weight (g)	$156^{a} \pm 21$	$150^{a} \pm 0.17$
4 week body weight (g)	$252.41^{a} \pm 7.44$	$261.77^{a} \pm 6.39$
6 week body weight (g)	$344.31^{a} \pm 7.84$	$385.37^{b} \pm 8.87$
8 week body weight (g)	$462.48^{a} \pm 10.02$	$614.12^{b} \pm 8.57$
10 week body weight (g)	$625.45^{a} \pm 22.68$	$779.61^{b} \pm 16.48$
12 week body weight (g)	$882.35^{a} \pm 17.13$	$1060.57^{b} \pm 19.24$
14 week body weight (g)	$928.13^{a} \pm 0.02$	$1185.55^{b} \pm 26.42$
16 week body weight (g)	$1136.34^{a} \pm 0.11$	$1396.78^{b} \pm 46.56$
18 week body weight (g)	$1323.39^{a} \pm 0.03$	$1562.85^{b} \pm 50.61$
20 week body weight (g)	$1416.32^{a} \pm 0.028$	$1756.19^{b} \pm 56.37$
Age at first egg laying (days)	167.36±2.13	151.49±1.10
Per cent mortality from 6 to 20 week of age	12.60	5.32
Per cent mortality from 21 to 40 week of age	7.33	2.71

Figures with different superscript in raw differ significantly $P < 0.05$, * Noni Fruit supplementation

Table 2. Effect of Noni fruit supplement on egg production and egg quality parameters of chicken

Parameters	Group I Mean ± SE	Group II (NFS*) Mean ± SE
40 weeks egg production	$43.67^{a} \pm 0.51$	$52.33^{b} \pm 0.55$
Egg weight at 28 weeks of age (g)	$42.46^{a} \pm 0.39$	$48.62^{b} \pm 0.46$
Egg weight at 40 weeks of age(g)	$50.23^{a} \pm 0.42$	$54.28^{b} \pm 0.43$
Albumen weight (g)	27.73±0.41	30.16±0.48
Albumen percentage	55.21±0.32	55.57±0.31
Yolk weight (g)	17.62±0.21	18.92±0.23
Yolk percentage	35.09±0.34	34.86±0.29
Shell weight	4.87±0.09	5.19±0.06
Shell percentage	9.70±0.13	9.57±0.11

Figures with different superscript in raw differ significantly $P < 0.05$, * Noni Fruit supplementation

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