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Low cost feed formulation for economical rearing of rural poultry

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Abstract
Population explosion worldwide has increased the demand for egg and meat over year. In India Availability of easy, economical poultry feed at reasonable cost is key for successful poultry business. Incorporation of conventional feed ingrediants in poultry feed has increased the cost of production tremendously. This lead to search for alternative unconventional locally available cheap feed sources for reducing the feed cost which in turn can reduce the total cost of production of meat and egg and making them easily available at cheaper cost in rural India. Low cost rearing of poultry bird will be a boon for marginal farmers and landless poor. Various easily available unconventional feed sources such as azolla, jujube, fruit, wheat bran, available in local or rural region could be a better alternative to conventional poultry feed. In present study non conventional feed sources was tested using different concentration of Azolla, jujube fruit powder, soybean grain and wheat bran. It is found that the treatment with Azolla (46.66%) + Jujube fruit powder (13.33%) + Soybean grain (26.33%) + Wheat bran (13.33%) was the best combination feed for poultry compared with the rest of the treatment and control. The birds fed with this feed did not showed any mortality however 40% and 30% mortality were observed in birds supplemented with control and market feed respectively.

Keywords: Low cost, formulation, economical, poultry

Introduction
Poultry industry as one of the most profitable business of agriculture provides nutritious meats and egg for human consumption. The feed constitutes 60-70 % of the total cost of production, any attempt to reduce the feed cost may lead to a significant reduction in the total cost of production. There is ever increasing demand for conventional feed ingredients for feeding of poultry. Incorporation of these feed ingredients in poultry feed has increased the cost of production enormously. Attempts to utilize locally available cheap non conventional feed sources may benefit the end users in reducing the feed cost which in turn can reduce the total cost of production of meat and egg and making them easily available at cheaper cost in rural India. Various low cost food materials like Azolla, wheat bran and Ber available in local areas which can be play boom role for poultry. Azolla is a free floating water fern that floats in water and fixes atmospheric nitrogen in association with the nitrogen fixing blue green alga, *Anabaena azolla*. Azolla is considered to be a potential biofertilizer in terms of nitrogen contribution to rice crop (Kannaiyan, 1992). Wheat bran is produced during the flour milling of wheat and consists of the protective layers of wheat grains. Bran contains much of the vitamins and protein of the wheat grain. Wheat bran is very palatable and can be fed to pigs, poultry, cattle, sheep and horses. Wheat bran has a laxative effect due partly to the fibre being only partially digested (Evans, 1985) [4]. The availability of such feed ingredients is not adequate because of the spiraling cost of raw materials and ever increasing competition with the human beings for the same food items. Hence, the search for alternative feed sources has become inevitable to reduce the feed cost (Swin, 2016) [10]. Jujube is a plant in the Rhamnaceae family, which includes 45 genera and 550 species. It grows as a wild plant in tropical and subtropical regions (Mukhtar *et al*. 2004) [7]. *Z. jujuba* Mill is a fruit of the Ziziphus genus that has a pleasant taste and serves as a medicinal plant (Gao *et al*., 2013) [5]. This plant, which is the native wild plant of many countries, delivers significant nutritional and medicinal values

(Xie, 2018) [13]. It is easily available in forest area or agriculture sector. It contains biologically active components are vitamin C, phenolics, flavonoids, triterpenic acids, and polysaccharides (Qing, 2013) [9]. Dried Jujube fruits powder can play an important role in digestion of feed material and improve immunity of chicks in poultry business between 1-8th weeks. The objective of present study to developed. Considering the demand for egg and meat in the coming years, low cost poultry rearing is a boon for marginal farmers and landless poor. There is an opportunity to utilize locally available non-conventional feed sources for low cost rearing of rural poultry. Hence, it challenges us to test these feed sources for producing low cost poultry feed to produce more meat and egg with less cost.

Material and Method

The work was undertaken at Assistant Director of Animal Husbandry Poultry Projects, Yavatmal and Vasantrao Naik college of Agricultural Biotechnology, Yavatmal. The birds of *Giriraj* species brought from regional hatchery centre, Nagpur. Five batches were made and each batch contain 25 birds all the batches provided all the facility like water, brooder, vaccination etc. Azolla produced at VNCAB college campus and about one kg of fresh azolla (mean yield per day in a season) was obtained from a pond of 6 X 4 feet size. Three different type of low cost feed material was developed and given name as T1, T2 and T3 depicted in Table 1. One batch of 25 birds supplement with Control feed which contain food grain of wheat, rice and sorghum and one T2 was standard feed (market feed) three treatment (T3,T4 and T5) belong to low cost feed. T3 contain azolla (66%) + wheat bran (34%), T4 Azolla (50%) + wheat bran (20%) + ber powder (30%) and T5 Azolla (46.66%) + wheat bran (13.33%) + ber powder (Jujube fruit powder) (13.33%) + soybean (26.33%). Vaccination was done on 5th and 6th week. Weight gain recorded in per week on digital weighing balance.

Table 1: Feed treatment for five different batches of Giriraja chicks

Batch	Treatments	Number of Birds	Supplemented feed
Batch 1	Control	25	Wheat, Jawar, Rice grain
Batch 2	Standard	25	Market feed
Batch 3	T1	25	Azolla (66%) + wheat bran (34%)
Batch 4	T2	25	Azolla (50%) + wheat bran (20%) + Ber powder (5%)
Batch 5	T3	25	Azolla (46.66%) + wheat bran (13.33%) + soybean (26.33%) + Ber powder (10%)

Results

The objective of feed formulation reduced cost and to derive a balanced diet that will provide appropriate quantities of biologically available nutrients required by the bird. In present study, natural ingredients were used for the formulation of feed material. All the batches of birds provided all the require facility.

Weight gain of birds

Differences in weight gain by birds was studied by subjecting five batches of birds to different treatments against control and standard feed. It is observed that the first batch supplemented control (food grain of rice, wheat and sorghum) showed lowest average weight gain up to 150gm. Batch 2nd supplemented with standard feed material (market feed) showed highest weight gain 800 gm upto 8 week. Whereas, Batch 3rd, Batch 4th and Batch 5th was provided with treatment T1, T2 and T3 (Table 1) respectively. It is found that the birds from batch 3rd provided with treatment T1 showed average growth up to 160gm, the birds from batch 4th and 5th supplemented with treatment T2 and T3 showed highest weight gain of 430gm among rest of the treatments depicted in fig.1 & 2.

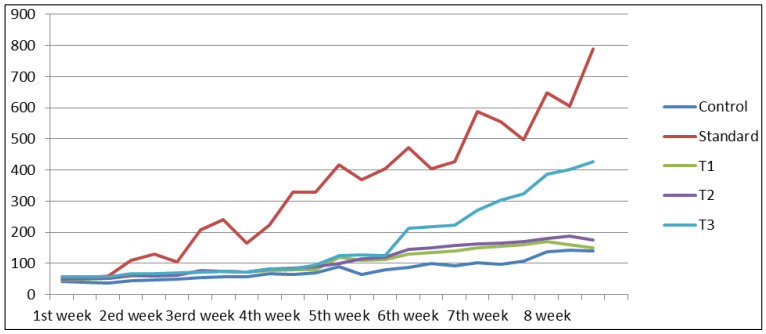

Fig 1: Weight gain by birds of different batches up to eight week

Market feed supplemented birds

Control feed supplemented birds

Fed with TreatmentT2 and T3 (Low cost feed)birds

Fig 2: Weight gain by birds on 8th week

Mortality percentage in birds

When birds were supplemented with low cost feed consumption rate of feed was found increased as compared to control and standard batches. After feeding low cost feed up to 5 week without providing any type of medicine, it was observed that there was no adverse effect on their body and no mortality recorded compared with birds supplemented with control feed and market feed which showed 40% and 30% mortality respectively (Table 2).

Table 2: Mortality percentage in birds

Sr. No.	Particular	Control Feed	Market Feed	Low Cost Feed		
				T1	T2	T3
1	Total Expenditure	1645	4341	1700	1720	1760
2	Average Weight gain	150gm	800gm	150 gm	180 gm	430gm
3	Mortality % in 8th week	40%	30%	No Mortality	No Mortality	No Mortality

Expenditure for preparation of feed material

Feed is the major input and feed cost is the major constraint but a major mean for manipulating production cost and making enterprise profitable. In present study, five different combination of unconventional feed sources were used to feed five batches of birds as shown in table no.1 & fig no.3. Total cost for the preparation of control feed was 1645/- Rs (Table 3). Total expenditure for preparation of low cost feed material was 1760/- Rs. The total cost require for the preparation of market feed was 4341/-Rs as shown in table no.3. For the preparation of market feed require more cost compare to control and low cost feed material but weight gain of birds is more compare to other feed material depicted in table no.2 & fig.1. Even though weight gain in birds fed with low cost feed material is less compared to market feed but mortality percentage was not noted. Mortality was found in birds fed with market and control feed (Table 2).

Market feed (Standard) Control Feed Low Cost Feed

Fig 3: Feed material for chicks

Table 3: Expenditure for preparation of feed material

Sr. No	Feed content	Control feed			Market Feed			Low cost feed		
		Required Quantity (kg)	Rate (Rs/Kg)	Total	Required Quantity (kg)	Rate (Rs/Kg)	Total	Required Quantity (kg)	Rate (Rs/Kg)	Total
1	Wheat	60	7	420	-	-	-	-		
2	Rice	35	10	350	-	-	-	-		
3	Jawar	05	19	95	-	-	-	-		
4	Maize	-	-	-	57	19.50	1111.5	-		
5	Soybean	-	-	-				25	20	240
6	Soybean DOC	-	-	-	36.5	33	1204.5	-		
7	Wheat bran	-	-	-	-	-		15	5	75
8	Ber powder	-	-	-	-	-		13	15	195
9	Azolla	-	-	-	-	-		47	10	470
10	Veg oil	-	-	-	15	55	825	-	-	-
11	Hi Pro	-	-	-	5	84	420	-	-	-
12	Labour charge	2	300	600	2	300	600	2	300	600
13	Electricity charge	30 units	6	180	30 units	6	180	30units	6	180
Grand Total =				1645			4341			1760

Discussion

In present investigation, low cost unconventional feed sources which are easily available in local region like Azolla, Ber powder, soybean grains, wheat bran etc. were used as a feed for birds. Feed material contain nutrition as well as immune response against disease is the need of poultry industry (Humphrey, 2005) [6]. Feed containing nutrition can influence bird's ability to mount an immune response and resist infectious disease. Jujube fruit is use as non-conventional feed ingredient in feed preparation which is rich in nutritive value

(Pareek, 2013) [8]. Jujube plant contains alkaloids, flavonoids, glycosides, saponin (Bhatt & Dhyani, 2013) [2] and it play an important role in bird purification, antimicrobial activity and detoxification. Birds supplemented with market feed showed more weight gain compared to low cost feed and control feed because it contains higher quantity (kg) of soybean. Soybean meal is the main protein source of poultry feed and is used in several forms in India because of its high protein content and digestibility (Thirumalaisamy, 2016) [11].

Conclusion

Feed produced from percent combination of nonconventional feed sources like Azolla (46.66%) + Ber powder (13.33%) + Soybean (26.33%) + Wheat bran (13.33%) could the best combination for low cost rearing of poultry bird. This will help to decrease the overall cost of feed and significantly increase economy of marginal farmer. Further there is need to search some more non conventional feed sources to accomplish weight gain by bids fed with low cost poultry feed

References

1. Alalade OA, Layayi EA. Chemical composition and the feeding value of azolla (*Azolla pinnata*) Meal of egg type Chicks, International Journal of Poultry Science 2006;5(2):137-141.
2. Bhatt S, Dhyan S. Quantification of secondory metabolites from *Zizipus Mauritiana* LAM. BARK International J of Biotech & res 2013;3(2):1-6.
3. Chandra A, Gupta IC. Arid Fruit Research Scientific Publishers, Jodhpur 1994.
4. Evans M. Nutrient Composition of Feedstuffs for Pigs & Poultry, Queensland Department of Primary Industries Information Series Q185001 1985.
5. Gao QH, Wu CS, Wang M. The jujube (*Ziziphus jujuba* Mill.) fruit: A review of current knowledge of fruit composition and health benefits. J Agric Food Chem 2013;61(14):3351-3363.
6. Humphrey BD. Nutrient needs of the immune system3rd Mid-Atlantic Nutrition Conferenc 2005.
7. Mukhtar HM, Ansari SH, Ali M, Naved T. New compounds from Zizyphus vulgaris. Pharm Biol 2004;42(7):508-511.
8. Pareek S. Nutritional composition of jujube fruit, Emir. J Food Agric 2013;25(6):463-470.
9. Qing-Han Gao, Chun-Sen Wu, Min Wang. The Jujube (*Ziziphus Jujuba* Mill.) Fruit: A Review of Current Knowledge of Fruit Composition and Health Benefits. J Agric. Food Chem 2013;61(14):3351-3363.
10. Swin BK. Low Cost Feed Formulation for Rural Poultry Production, ICAR- Short Course on Empowering Farmwomen Through Livestock and Poultry Intervention, ICAR-Central Avian Research Institute (CARI) Regional Centre, Bhubaneswar 2016.
11. Thirumalaisamy G, Muralidharan J, Senthil Kumar S, Hema Sayee R, Priyadharsini M. Cost-effective feeding of Poultry, Int Jour of Sci, Env and Tech 2016;5(6):3997 -4005.
12. Tripathi Preeti, Tripathi Shalini. Ziziphus Jujuba: A Psychopharmacological Review, International Journal of Research and Development in Pharmacy and life Sciences 2014;3(3):959-966.
13. Xie B, Wang PJ, Yan ZW. Growth performance, nutrient digestibility, carcass traits, body composition, and meat quality of goat fed Chinese jujube (*Ziziphus jujuba* Mill) fruit as a replacement for maize in diet. Anim Feed Sci Technol 2018;246:127-136.