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PROMOTION OF BACK YARD POULTRY FOR AUGMENTING EGG CONSUMPTION IN RURAL HOUSEHOLDS

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Introduction

There is high prevalence of protein calorie malnutrition and micronutrient deficiencies in India, particularly in growing children and women [1-3]. This is understandable since cereal–based Indian diets are qualitatively deficient in micronutrients due to low intake of vegetables, fruits, pulses and foods of livestock origin [1]. Apart from micronutrients, livestock-based foods are good source of high quality protein. Amongst foods of livestock origin, poultry egg is most promising in terms of cost benefit ratio. While the consumption of animal meat in India has declined between 1985 and 2003 that of poultry meat and eggs has increased. This is possible due to tremendous increase in commercial poultry farms [4, 5]. Price of poultry has shown little rise from 1996-2006 due to increased competition, and organised marketing of poultry products simultaneous with remarkable improvements in genetics, nutrition, disease management and housing of birds. Commercial poultry has largely benefited urban population since these large farms are established around urban and peri-urban areas where large demand for these products exists. Transport of live birds or even eggs is difficult for rural areas because of poor roads and scarce demand. Back yard poultry (BYP) offers great promise in these areas more in terms of household food security than income, though potential for augmenting income and employment for women is also there [4, 5]. Back yard poultry, with nondescript country birds is routinely found in rural households in India. These birds are well acclimatised, have prominent brooding behaviour and mothering ability. But they are small in size; lay only 30-40 eggs per year making BYP uneconomical and nutritionally inadequate. In recent years improved birds for BYP which are good layers yielding over 150 eggs per year have been developed [6].

Though case studies suggesting benefits of BYP for raising household income have been reported [7], there is no information on the impact of BYP on consumption of eggs or poultry by the family and its impact on human nutrition. The present report examines the feasibility of promoting BYP using improved birds in villages of Medak district of the South Indian State of Andhra Pradesh to augment the household nutritional security with minimal inputs.

Materials and Methods

This report includes findings of two studies. Location of both the studies was villages from Medak district in the State of Andhra Pradesh (Table I). It is a low rain fall area where farming is the major occupation. Most families have small or marginal land holdings- own or leased. The first project (2007-2010), included eight villages from four mandals (population 10,000), (Table I). BYP was a part of a larger project on 'Diversification from agriculture to nutritionally and environmentally promotive horticulture in a dry land area' [8]. The second project (2010-2012), included five villages from the Narsapur mandal, four of which were from the earlier study, plus an additional village (Table I). It was beamed at empowerment of adolescent girls through scientific and social engineering.

Introduction of improved BYP

In the project 1, two types of improved birds- Gramapriya and Rajasri were introduced as BYP. Total of 164 families who were willing to pay for the hens and construct night shelters with partial contribution from the project funds, received the birds. Initially Gramapriya breed, a good layer type bird of medium size, developed by Project Directorate on Poultry, (Indian Council of Agriculture Research), Hyderabad, was given to 79 households. Subsequently, Rajasri breed bird with better attributes like medium body size, long shanks, better flight and good egg production (ranging from 150-175 eggs), developed by All India Coordinated Project on Poultry(AICP) breeding, Sri Venkateswara Veterinary University, Rajendranagar, Hyderabad [6] was given to 85 families. Each family was given four female and one male bird, three months old. The participants were advised to remove the cocks of non-descript variety to prevent cross breeding of stock.

In the second project, Rajasri breed was given to 35 families. Since AICRP-ANGRAU insisted on selling only one day old chicks, two

TABLE I

Villages Selected for the Two Studies

Village	Mandal	Population	Project 1	Project 2
Mantur	Narsapur	720	+	+
Reddypalli	Narsapur	1483	+	+
PCKUnta	Narsapur	1317	+	+
Ramchandrapur	Narsapur	1279	+	+
Pilutla	Sivampet	3110	+	_
CC Kunta	Sivampet	1720	+	_
Mangapur	Hatnura	2300	+	_
Nastipur	Hatnura	1400	+	_
Narayanpur	Narsapur	1149	_	+

+ Village included - Village not included

local farmers who were trained in rearing one day old chicks were persuaded to buy them, raise them for 3 to 4 months and sell them to the community. This became an income generation activity for them. Each family purchased four birds, mostly females. Few families preferred to purchase 3 females and 1 male bird. One male bird was given free by way of incentive. All the birds in the village regardless of pedigree were immunised against Fowl pox and Newcastle disease. Periodical de-worming was advocated to remove internal parasites. In both the projects, families with preschool age children were given preference

Training programmes

Centralised training was given 2 to 4 times a year (at the DCT hospital campus, in Narsapur village) on management of BYP (need for well ventilated night shelter; supplementary feeding besides foraging for optimal egg production; brooding and rearing of young chicks; ,identification of sick birds, importance of isolating them from healthy birds, preventive vaccination for important poultry diseases; etc) at the DCT centre in Narsapur. Hands on training in villages during frequent visits by project staff were also given and staff attention was provided promptly whenever needed in case of emergencies. Nutrition education stressing the importance of home consumption of eggs and poultry, particularly by growing children, adolescents and pregnant and lactating women was an important component of the training programmes. Construction of a low-cost night shelter with partial financial support from the project was insisted upon.

Impact evaluation

Impact of the project was assessed by studying the acceptance of the project (willingness to pay for the birds and other inputs, build night shelter, immunisation, provision of special feed etc), as well as increase in egg consumption. The latter was measured through an initial and end-line semi-quantitative diet survey (Tables II and III) in which the families were asked about number of members above the age of one (capita), frequency of egg consumption in a typical week (no guests, feasting or fasting) and number of eggs cooked each time. From this, estimate of weekly per capita egg consumption was calculated. Such a semi-quantitative method of diet survey can be used in a rural area where diets lack variety [8].

Results and Discussion

Impact on frequency and number of eggs consumed

The community readily accepted the project. The families paid Rs. 500/- (including transport) for the four birds purchased by them. Construction of night shelter was subsidised. Due to practical constraints, detailed record of eggs laid or used for hatching chicks etc. could not be maintained. However, a few educated farmers who kept such records reported 130 -140 eggs per hen per year. Data in Tables II and III show that the impact of improved BYP on egg consumption was marked. Both the frequency as well as number of eggs consumed increased significantly in both the projects, after the introduction of BYP. Knowledge of poultry management also improved and the farmers appreciated the importance of eating eggs for maintaining good health. Most eggs were

TABLE II

Impact of Back Yard Poultry with Improved Birds on Egg Consumption in the First Project

Details	Initial[1] Mean ±SD	End–line[2] Mean ±SD	P value[3]
Number of households	164	164	
Frequency of egg consumption per week/household	1.37 ± 2.20	2.2 ± 0.43	<0.01
Number of eggs consumed per capita per week	0.7±0.34	2.43±0.92	<0.01

1. Before distributing the birds
2. At the end of 2.5 years of the project.
3. Two sample t-test to test the significance between initial and end- line values.

consumed at home. A few hatched at home and a few sold at higher price for hatching to other families.

The ready acceptance of BYP is understandable since the investment needed is low, with no additional demand for land or water. Since these birds forage, demand on additional feed is not much and manageable with the locally available food grains like sorghum and broken rice or other minor millets. The impact of improved BYP on egg consumption of families is very encouraging. In the present study, within-family distribution of eggs was not studied, but the need to give eggs to children and pregnant and lactating women was stressed. Assessment of nutrition status in terms of growth of children or reduction in micronutrient deficiencies was also not done due to practical constraints. However, with this level of increase in egg consumption, impact on nutrition can be expected since egg is an unadulterated wholesome food with highest biological value, rich in good quality protein (gold standard) and micronutrients, particularly the most limiting ones in Indian diet- vitamin A and riboflavin besides minerals. Though BYP may not contribute to income in a big way, it can generate some income through sale of eggs and birds, particularly if the stock expands through hatching of eggs.

TABLE III

Impact of Back Yard Poultry With Improved Birds on Egg Consumption in the Second Project

Details	Initial[1] Mean ±SD (June 2011)	End –line[2] Mean ±SD (December 2012)	P value[3]
Number of households	35	35	
Frequency of egg consumption per week/household	1.82 ± 0.568	2.48 ± 0.562	<0.001
Number of eggs consumed per capita per week	1.78 ± 0.832	2.55 ± 0.618	<0.001

1. Before distributing the birds
2. At the end of 1.5 years of the project
3. Two sample T-test to test the significance between initial and end- line values

Recently the Government of Andhra Pradesh has introduced eggs- once or twice a week in the school Mid-Day-Meal (MDM) programme as well as the supplementary feeding programme for pre-school children in its Integrated Child Development Scheme (ICDS). Village- level production of eggs in BYP can supply eggs to these programmes if there is a quantum jump in production. With proper training, BYP farming can become an income generation activity for self- help groups [9]. A combination of BYP and homestead production of vegetables, fruits, legumes and millets can be a good food- based approach to combat malnutrition [7].

Problems encountered

Despite construction of night shelters, birds were lost due to predation by cats and mongooses during the day when they forage freely. Some families sold the birds. Though 30per cent families increased the stock by hatching, the quality could not be ensured due to access to local breeds of cocks. Total removal of local breeds of cocks would be questioned from the point of view of loss of local biodiversity.

Attempts to introduce one day old chicks to families was not successful, since most of the chicks died due to inexperienced management by the beneficiaries. This problem can be resolved by establishing Mother units near the areas of distribution to rear the day old chicks to eight weeks of age by properly trained local farmers. This will help in saving of distribution costs, avoid chick mortalities and ensure proper vaccination to chicks before placing them in beneficiary house holds.

These units can be established by resourceful/funding authorities and to be handled by local farmers specially trained for the purpose.

Summary and Conclusion

Cereal-pulse-based Indian diets are very deficient in micronutrients due to low intake of legumes, vegetables, fruits and animal products. Animal foods (including milk & eggs) are a good source of high quality protein and micronutrients. Poultry eggs are least expensive among livestock- based foods.

The feasibility of promoting back yard poultry (BYP) using improved high egg-yielding birds to increase food security of rural households was examined in two separate studies. In both the studies landless, small and marginal land- holding families from 8 and 5 villages respectively from Medak district of the South Indian state of Andhra Pradesh were motivated to accept high egg-yielding varieties of BYP developed by the local veterinary institutions. Centralised and decentralised training was given in poultry management (vaccination, deworming, supplementary feeding, construction of night shelter etc). Immunisation for Fowl pox and Newcastle disease was done for all the birds in the village including the nondescript ones. Nutrition education of the community was an important component of the project.

Each of the stake holders (164 in the first project and 35 adolescent girls in the second project) received 3- 4 months old birds (4 hens and 1 cock). Some families preferred to get

three hens and two cocks. The families paid Rs 500, including transportation, for four birds and one cock was given free as incentive. Well –ventilated, brick and mud night shelters with grills for windows and door were constructed to accommodate 10-15 birds. Initial and end-line, semi quantitative diet surveys done after 3 years in the first project and 18 months in the second project showed that weekly frequency as well as per capita number of eggs consumed per week increased significantly after the introduction of BYP. BYP is a promising model for improving household food and nutrition security.

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REFERENCES

1. National Nutrition Monitoring Bureau. Diet and nutrition status of population and prevalence of hypertension among adults in rural areas. Technical Report No. 24, National Institute of Nutrition, Hyderabad, India, Indian Council of Medical Research, 2006.
2. National Nutrition Monitoring Bureau. Prevalence of micronutrient deficiencies. Technical report No. 22, National Institute of Nutrition, Hyderabad, Indian Council of Medical Research, 2003.
3. UNICEF, The State of the World's Children Special Edition: Celebrating 20 Years of the Convention on the Rights of the Child. 2009.
4. Pica-Ciamarra, U. and Otte, J. Poultry food security and poverty in India. : Looking beyond the farm gate. Pro-Poor Livestock Policy Initiative. A living from livestock. RR Nr.09-02 February 2009. WWW.fAO.org./ag/pplpi.html
5. Government of India. Basic animal husbandry statistics. Ministry of agriculture, Government of India, New Delhi, 2006.
6. Viroji Rao, S.T. and Chinni Pretam. Breeding strategies for improved birds in backyard poultry. Lead paper presented at National Workshop on 'Synthasising experiences in promotion of backyard poultry' July 9,10, 2009, Hyderabad, India.
7. Talkukdar, A., Haselow, N.J., Osel, A.K., Villate, E., Reario, D., Kroeun, H., SokHoing, L., Uddin, A., Dhunge, S. and Quinn, V. Homestead food production model contributes to improved household food security and nutrition status of young children and women in poor populations. Field Actions Science Reports (online), Special issue 1-Urban Agriculture, Online since 17 fevrier 2010, Connection on 13 juin 2010. URL : http//factsreports.revues.org/index404.html.
8. Bamji, M.S., Murty, P.V.V.S., Rao, M.V.V. and Satyanarayana, G. Diversification from agriculture to nutritionally and environmentally promotive horticulture in a dry land area. *Sight and Life,* 2011, **25**, 38-42.
9. Raha, C. and Marse, R. Towards good livestock policies: Back yard poultry farming through self-help groups in west Bengal. Good Practice Note, Delhi, India. SA PPLPP (2009) Code: SAGP 11.