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TRAINING IMPACT ON HOUSEHOLD ECONOMY FROM BACKYARD CHICKEN

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ABSTRACT

One hundred out of 200 randomly interviewed females in 10 villages of Mardan were selected to establish female groups. The members were trained in backyard chicken production by Female Livestock Extension Workers under the Livestock Extension Women Worker project, North West Frontier Province (NWFP), Pakistan. Regular follow up visits were made and data prior to and after one-year of training were collected to assess the impact of training on contribution of backyard chicken production to household economy and other associated problems. Training significantly ($p < 0.05$) improved contribution of backyard chicken to household economy. Hatchability, mortality and flock size had a significant ($p < 0.01$) association with cash income obtained from backyard chicken. Extension workers had mobility problems and the handouts/material provided was not fully understandable by members. Extension workers couldn't fully transform most of the terminology regarding chicken production into local language. Late arrival of extension workers to the appointed places was one of the major complaints made by most of the members. Training, regular monitoring of the production activities, increased flock size, effective control of diseases and extending extension services to the whole community would be important factors to increase subsistent income obtained from backyard chicken.

1. INTRODUCTION

Backyard, one of the subsistent chicken production activities, contributes a significant portion (Rs.5959.485±267.60) to per capita total annual cash income (Shakir, Mian & Farooq, 1999). Bessei (1989) and Farooq and Mian (2002) reported backyard chicken production on small farms contributing a considerable amount to the cash income of rural families. In 1998-99 there were 243 million backyard chickens (135

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million chicks, 54 million layers and 54 million cocks), which contributed Rs. 57591 in million to the National economy of Pakistan (Economic Survey 1998-99). Revenues generated from the backyard chicken could further be increased when backyard chicken is given due attention in terms of good health coverage, introduction of highly productive stock and reduced mortality. Shakir *et al* (1999), Farooq, Shoukat, Asrar, Shah, Durrani, Asghar & Faisal (2000) and Farooq *et al* (2001) also reported proper health coverage, increase in flock size, introduction of exotic birds, reduction in mortality and provision of training to the farmers in backyard chicken for maximizing benefits.

Thus, realizing the importance of backyard chicken in increasing rural household income and alleviation of poverty through subsistent income generation, Female Livestock Extension Women workers (FLEWs) were trained under the Livestock Extension Women Workers (LEWW) project, North West Frontier Province (NWFP) in various disciplines of livestock production practices to help the poor and subsistent females in generating higher income. The FLEW(s) were providing inputs to females in terms of training, health coverage and establishing linkages of the farmers with other organizations working for livestock development. The activities of the FLEW(s) were regularly monitored by the project staff and on spot training was provided in groups. Such activities were also undertaken by numerous projects in the past, however no such efforts were made to quantify the benefits of the extension services given to member female farmers. The present study was thus, undertaken to quantify the impact of training on contribution of backyard chicken to household economy over a year period.

2. MATERIALS AND METHODS

A research project was planned during the year 1998-99 to assess the impact of training given during to 100 women members in 10 different villages of Mardan division, Pakistan by Female Livestock Extension Workers (FLEWs) under the Livestock Extension Women Workers (LEWW) project, North West Frontier Province (NWFP), Pakistan. Initially, 200 women were randomly interviewed to select 100 eager women for establishing various groups to be trained in backyard chicken production and regularly visited/monitored by the FLEW(s). In each village one-group comprising 10 women was established by FLEW(s) to provide training in backyard chicken and regularly monitor their activities in bi-weekly meeting. Training included skill development in; production, breeding of highly productive stock, care of the newly hatched chicks, housing, feeding, disease prevention, hygienic measures, control of external and internal parasites, egg selection and storage, hatchability and its requirements, selection and

culling of birds, provision of vaccines and some other medicines etc. In addition, FLEW(s) were asked to develop linkages between the women groups and private organizations or agencies and civil veterinary hospitals of the Livestock and Dairy development Department, Government of NWFP. The FLEW(s) were specially trained to work for vertical expansion of backyard chicken within limited resources of the women. Thus, no significant increase in operational cost was expected while launching training program. For example, the women buying broken rice from the market for the newly hatched chicks were asked to replace it with chick starter for better growth and development of the chicks. However, if the women would like to make some drastic changes for higher production, then they could better be guided for increasing inputs. The project provided no other extra inputs in quantity except vaccines and some medicines. Majority of the women in the study area was already rearing mixed flocks of Rhode Island Red (RIR), Fayoumi and indigenous non-descript chicken (Desi). Information about household size, flock size, egg production, and consumption, morbidity, and mortality, egg, chick, and bird price, number of eggs, chicks, and birds sold and hatchability performance of backyard chicken were collected before starting training program. After one-year period of training, activities and regular follow up visits, the aforementioned information regarding household chicken production were again recorded. All relevant information recorded, were later on transferred to a computer for analyses. Problems faced by FLEW(s) while executing extension activities were also asked. Information on ready availability of extension workers to the members was also enquired from the farmers. Cost of production on chicken under backyard condition is almost negligible, thus instead of calculating amount of monetary losses, the term economic ramification was used to work out reduction in gross or cash income resulting from morbidity, mortality and reduction in egg production. The data were analyzed using relevant statistical techniques of analyses namely, GLM (General Linear Model) procedure (Steel & Torrie, 1981), univariate and multiple regression analysis (Wonnacott & Wonnacott, 1985).

To ascertain the effect of effect of training status of the member on cash income obtained from the sale of chicks, the following statistical model was constructed adopting the procedure given by Steel and Torrie, (1981).

$$Y_{ij} = \mu + \alpha_i + e_{ij}$$

Where; Y_{ij} = j-th observation on cash income from the sale of chicks reared by women receiving i-th training in backyard chicken production, μ = Population constant common to all observations, α_i =

the effect of i -th training; $l =$ before receiving training, after receiving training, e_{ij} = the residual term associated with each Y_{ij} , assumed to be normally, independently and identically distributed with mean zero and variance 1.

A similar, model was employed to egg, chick, and bird price, number of eggs, chicks, and birds sold, per capita, and household total gross and cash income, gross and cash income from the sale of eggs, chicks, and adult birds and economic ramification.

The association between cash income from backyard chicken, number of eggs consumed and sold, morbidity, mortality and hatchability was established by constructing the following model adopting the procedure outlined by Wonnacott and Wonnacott (1985).

$$Y = b_0 + b_1X_1 + \varepsilon_i$$

Where, "Y" was response variable; "b_i" the partial regression coefficients; "X_i" the regressors and "e_i" was the residual term.

3. RESULTS AND DISCUSSION

3.1 Number of eggs, chicks, and birds sold and their prices

Average price of bird (Rs.84.89±1.2) and chick (Rs.25.75±1.46) was small ($p < 0.05$) before training than that after training (Rs.101.46±1, and Rs.31.27±1.38 respectively; Table 1). Non-significant differences existed in egg prices charged before and after training. The smaller price per bird before training is attributable to one-year duration after training was given. The data was collected for the second time after one-year of training, thus, no conclusive evidence could be grasped to justify the differences in prices before and after one-year period of training.

Training had a significant effect ($p < 0.01$) on number of eggs sold. Significantly smaller ($p < 0.05$) number of eggs per household and per capita were sold before training than that after training (Table 2). The higher per capita and or number of eggs sold by a household after getting training could be due to higher egg production, adoption of better husbandry practices and rearing highly productive stock of chicken. Non-significant differences existed between number of chicks and birds sold before and after getting training.

Table 1: Prices and economic ramification due to morbidity and mortality prior to and after the training in backyard chicken production

Variables	Before Training (1998)		After Training in 1999	
	Mean±SE	CV(%)	Mean±SE	CV(%)
Chick Price (Rs.)	25.75 _b ±1.46	25.4	31.27 _a ±1.44	22.6
Bird Price (Rs.)	84.89 _b ±1.23	14.1	101.46 _a ±1.00	9.7
Egg Price (Rs.)	2.54 _a ±0.02	8.9	2.56 _a ±0.02	8.3
a) Economic Ramification due to reduction in egg production (Rs.)	1425.4 _a ±19.26	40.5	1073.59 _b ±51.64	48.3
b) Economic Ramification due to mortality in chicks (Rs.)	101.01 _a ±13.50	59.8	86.04 _b ±5.39	46.3
c) Economic Ramification due to mortality in birds (Rs.)	358.19 _a ±28.39	81.6	290.92 _b ±27.82	90.5
Total Economic Ramification (a+b+c; Rs.)	1884.6 _a ±38.85	25.6	1450.55 _b ±64.92	54.6
Economic ramification per bird (Rs.)	100.51 _a ±23.09	73.1	47.05 _b ±6.70	77.3

3.2 Gross and cash income from backyard chicken

Training status of the women had a significant effect ($p < 0.01$) on annual household gross and cash income obtained from the sale of eggs, chicks and adult birds. Significantly lower ($p < 0.05$) annual household total gross (Rs. 3848.45±64) and cash income (Rs. 2981.70±54) was obtained by females before training than that after getting training in backyard chicken production (Rs. 6304.80±164 and Rs.4482.34±38, respectively; Table 2). Similarly, smaller per capita total annual gross (Rs. 398.80±12.7) and cash income (Rs. 308.96±7.9) was obtained by females before getting training than that after training (Rs. 651.99±38.1 and Rs.463.53±26.6, respectively; Table 2). Annual household gross and cash income from backyard chicken represented significantly lower ($p < 0.05$) gross income from total number of eggs, chicks and birds before getting training than after training (Table 2). Non-significant differences existed in per capita annual household cash income obtained from the sale of birds prior to and after getting training in backyard chicken production (Table 2). Non-significant differences also existed in per capita annual cash income from the sale of chicks by females before and after training. However, lower ($p < 0.05$) per capita annual cash income was obtained from the sale of eggs before training (Rs. 217.93±14.4) than after training (Rs. 364.5±21.2). The findings suggested a higher household or per capita gross and cash income from backyard chicken in Mardan division after the females were trained in backyard chicken production. This could be due to better care and management of the birds by trained farmers and raising large number of highly productive stock of backyard chicken than before training. In addition, reduction in morbidity, mortality in backyard chicken and better hatchability of eggs after getting training could be the other possibilities for obtaining higher gross and cash income. The non-significant differences in per capita annual cash income from the sale of chicks and adult birds before and after getting training in backyard chicken could be due to the awareness generated through training among females for maintaining a higher flock size and reduced sale of valuable birds and chicks.

Cash income from backyard chicken was affected by hatchability performance of chicken, morbidity, mortality and flock size. Percent hatchability ($b=24.07±6.66$), morbidity ($b=-39.34±8.49$), mortality ($b=-16.27±9.26$), flock size ($b=17.55±2.57$) and number of eggs sold ($b=2.52±0.07$) were found significantly ($p < 0.01$) associated with cash income obtained from backyard chicken (Table 3). Holding the other independent variables constant, one-percent increase in hatchability would result in an increase in cash income by Rs. 24.07. On the other hand, one-percent increase in morbidity or mortality will reduce cash

Table 2: Contribution of backyard chicken prior to and after training

Variables	Before Training (1998)		After Training (1999)	
	Mean±SE	CV(%)	Mean±SE	CV(%)
I) Household				
Eggs sold (#)	827.97 _b ±8.8	34.95	1376.86 _a ±33	23.6
Chicks sold (#)	6.76 _b ±0.9	118.1	8.30 _a ±0.6	52.23
Birds sold (#)	8.32 _a ±0.67	91.81	6.88 _b ±0.7	104.1
a) Gross income from eggs (Rs.)	2751.76 _b ±23	26.29	4169.27 _a ±100	25.25
b) Gross income from chicks (Rs.)	215.53 _b ±27.8	57.59	442.16 _a ±25.9	37.84
c) Gross Income from birds (Rs.)	881.16 _b ±58.9	69.40	1693.37 _a ±119	68.81
Total gross income (a+b+c; Rs.)	3848.45 _b ±64	38.00	6304.80 _a ±164	28.82
d) Cash income from eggs (Rs.)	2103.04 _b ±522	34.72	3524.76 _a ±24	24.94
e) Cash income from chicks (Rs.)	174.07 _b ±45.8	140.2	259.54 _a ±5.03	67.36
f) Cash income from birds (Rs.)	704.59 _a ±47.8	83.29	698.04 _a ±19.6	99.09
Total cash income (d+e+f; Rs.)	2981.70 _b ±54	54.78	4482.34 _a ±38	31.25
II) Per Capita				
Eggs sold	85.8 _b ±1.63	53.24	142.68 _a ±7.6	45.27
Chick sold	0.70 _b ±0.09	79.76	0.55 _b ±0.1	73.97
Birds sold	0.86 _b ±0.07	98.96	0.71 _b ±0.1	118.8
a) Gross income from eggs (Rs.)	285.16 _b ±5.6	51.61	431.15 _a ±23.8	49.02
b) Gross income from chicks (Rs.)	22.33 _b ±3.9	66.54	45.72 _a ±5.02	57.07
c) Gross income from birds (Rs.)	91.13 _b ±9.2	88.46	175.12 _a ±19.6	93.01
Total gross income (a+b+c; Rs.)	398.80 _b ±12.7	61.02	651.99 _a ±38.1	54.79
d) Cash income from eggs (Rs.)	217.93 _b ±14.4	56.57	364.5 _a ±21.2	98.33
Cash income from chicks (Rs.)	18.03 _b ±13.8	108.1	26.84 _a ±2.7	66.81
Cash income from birds (Rs.)	73.01 _a ±6.2	90.52	72.19 _a ±10.4	117.7
Total cash income (Rs.)	308.96_b±7.9	65.92	463.53_a±26.6	53.57

Table 3: Prediction of cash income from hatchability, morbidity, mortality, flock size and number of eggs sold, and consumed by a household

Response variable (X₀) = Cash income from backyard chicken						
Independent variables						
X ₁ = Per cent hatchability,		X ₂ = Per cent morbidity,				
X ₃ = Per cent mortality,		X ₄ = Flock size,				
X ₅ = Number of eggs sold,		X ₆ = Number of eggs consumed,				
Model 1, R² (adjusted) = 57.13%				Model 2, R² (adjusted) = 90.82%		
Estimates	Parameter Estimate±SE	P	r (partial)	Parameter Estimate±SE	p	r (partial)
b ₀	2188.59±635.08	0.0007	-	110.68±95.66	0.248	-
b ₁	24.07±6.66	0.0004	0.25			
b ₂	-39.34±8.49	0.0001	0.31			
b ₃	-16.27±9.26	0.0001	0.12			
b ₄				17.55±2.57	0.0001	0.44
b ₅				2.52±0.07	0.0001	0.93
b ₆				-0.36±0.61	0.5502	0.04

income by Rs. 39.34 and Rs. 16.27, respectively. Thus, efforts shall be made to keep the chicken health thereby avoiding undue risks of mortality and morbidity.

3.3 Economic ramification due to morbidity and mortality in backyard chicken

As cost of production on chicken under backyard condition is almost negligible, instead of calculating amount of monetary losses, the term economic ramification was used to work out reduction in gross or cash income resulting from morbidity, mortality and reduction in egg production. Training status of the women had a significant effect ($p < 0.01$) on total household economic ramification in backyard chicken. Total household economic ramification in backyard chicken was significantly higher ($p < 0.05$) before training was given to females than after training (Table 1). Household economic ramification due to reduction in egg production because of morbidity was also significantly higher ($p < 0.5$) before the females received training (Rs. 1425.4 \pm 19.26) than that after training (Rs. 1073.59 \pm 51.64). Similarly, household economic ramification due to mortality in chicks (Rs. 101.01 \pm 13.5) and adult birds (Rs. 358.19 \pm 28.39) was significantly higher before training than that after training (Rs. 86.04 \pm 5.39 and Rs. 290.92 \pm 27.82, respectively; Table 1). The higher economic ramification in backyard chicken could probably be due to Newcastle disease as it was more prevalent in the study area. Naila *et al* (2001) also reported Newcastle disease to be the major cause of mortality and higher economic ramification in backyard chicken. Findings of the present study suggested smaller economic losses in backyard chicken after the females were trained in backyard chicken production. This could be due to appropriate control of diseases and mortality in backyard chicken through better care and health coverage provided by the trained females as compared to untrained women. Farooq *et al* (2000) also reported smaller disease incidence and mortality in those chickens maintained by trained than untrained females.

3.4 Problem faced by the FLEW(s) and their ready availability to the group

The FLEW(s) had several problems regarding their mobility and easy access to various female groups. The handouts and material provided to the extension workers was not fully understandable by the females. Most of the vaccines were not available in the nearby markets and women were not eager to bring it from remote cities. Visits of the extension workers were quite frequent, however late arrival of the extension workers to the appointed place was one of the major

complaints made by most of the women. The extension workers were not fully able to transform most of the terminologies regarding chicken production in to local language.

4. CONCLUSIONS

More revenues were generated by the woman from backyard chicken in Mardan division after getting training. Extension workers were paying regular visits, however, there were some difficulties that hindered their efficiency. They had mobility problems and the handouts/material provided to them was not fully understandable by the females. Late arrival of the extension workers to the appointed places was one of the major complaints made by most of the women. In addition, the extension workers were not fully able to transform most of the terminology regarding chicken production in to local language.

5. RECOMMENDATIONS

The FLEW(s) shall be motivated to honor the appointed time and reach well in time or before the activity is to be carried out. A regular training and monitoring system for them shall be adopted and their problems be addressed to better utilize their services for community development. Regular follow up visits and on spot training shall be given to females to further strengthening their activities/capabilities to sustain the income obtained from backyard chicken and avoid undue losses. Efforts shall be made to make the extension messages more understandable and easy in future. Increased flock size, assuring higher productivity and reduction in morbidity and mortality would be the important factors to increase subsistent income. In addition, a mass extension program for the whole community irrespective of the members of the group shall be chalked out to uplift poverty and enable the women to increase household income.

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