

Brooding Hen for Resource Poor Women and Children

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Abstract

Broody hens called "Sakini", raised under scavenging environment of each were allowed to incubate 8 eggs in individual nests. The allowed duration of brooding was 18, 12, 9 and 3 days for first, second, third and fourth hens respectively. At respective night, day old, improved chicks replaced hatching eggs. All hens accepted foreign chicks as their own. The least duration of brooding (3 days) was replicated 4 times, to reduce chance error. Chicks with their mother hen were kept together with ad lib. Supply of commercial feed only for first day and onward second days, they were allowed to graze in the ground. Each mother hen guarded her chicks and taught about enemies and feed searching methods. At the same time, ten chicks were raised under confined condition with intensive management to compare them with scavenging birds. In 68 days, average weight gained by confined birds was 1940 g with 6800 g feed consumption. On average, the total and net returns per birds were calculated as 1.8 and 0.49 US \$ respectively. Another side, the average weight gained by scavenging birds was 1040 g with consumption of 700 g commercial feed and 2400 g maize grits. The average total and net returns per birds were calculated as 1.78 and 1.43 US \$ respectively. Therefore, for resource poor, rural farmers; small scale poultry production under scavenging system with brooding hen is more profitable than confined intensive management.

Keywords: Brooding hen, scavenging system, foreign chicks, intensive management, profitable

Problem Addressed

Poultry production in Nepal had increased drastically from 1981 to 1992. The population of poultry bird was increased from 716.9 million to 12333 million (CBS, 1995). There are many commercial poultry farms with relatively large number of chickens. They raise improved layers as well as broilers. The popular commercial broilers for Chitwan farmers are

Hubbard, Arborecre, Vencobb, Avian 34 and Avian 43 (Dhakal, 1995). But majority of the farmers are poor and they are with 1-4 broody local hens. They raise them under scavenging environment. Such very small scaled, scavenging system of poultry production has been adopted by scheduled (untouchable) caste Nepalese poor since very long. Nowadays, due to educational advancement, many peoples including supreme caste (Brahman) have also been interested and involved in production and consumption of chickens. All these poor farmers raise chickens with kitchen and other wastes. These scavenging chicks feed mainly on insects, fly maggots, insect's larvae, kitchen wastes, and threshing, cleaning wastes of cereal grains. There is very low direct cost involvement and almost no competition with human foodstuffs. They eat maggots of houseflies and insects which help to reduce disease transfer by them. They also control plant pests (Alders (1996). Another key point is that it is one agricultural activity in Nepal where women have significant ownership share.

These scavenging chicks have various uses but main is household consumption. In Nepalese society, cockerels only from this system are accepted in religious activities e.g. Puja and marriages. The local market price of cockerel raised under scavenging system is double (2 US \$ / kg live weight) than cockerels of improved chicks (0.90 US \$ / kg live weight) raised under confined condition with intensive management (Market survey of Rampur, Mangalpur and Narayanghat, Chitwan, 1998). Eggs, only from scavenging hens are used in religious activities e.g. Puja. So, in certain society, poultry birds raised under scavenging system are more important. When household economy temporarily goes down, these farmers sell their chicken and spend collected money for their child education. Farmers select the eggs for hatching and rest eggs are given to the children to eat. That means chicken directly contributes to the child nutrition of the poor farmers. Nepalese poultry consumers are taste oriented. They prefer the eggs and meat of poultry birds raised under scavenging system than the confined but the chickens already adopted under Nepalese scavenging system are very small (1.2 kg live weight / bird) and produces only 50-60 eggs per annum (Singh, et al.,

1993). They are broody in nature and incubate their eggs themselves to produce chicks. The eggs hatchability is very poor. Sometimes, one hen gets only one chick after 21 days of incubation. If we could reduce this risk of getting less chicks from natural hatching and could introduce high producing improved chicks under their existing scavenging system, it could contribute directly to the poor farmers. Some of the farmers had shown their interest to improved chicks and introduced day old chicks in their system but most of these chicks were predated by their natural enemies e.g. Eagles, mangos, Crows and other carnivore birds. That shows the interest of the farmers to the improved, high producing chickens but due to the lack of matchable technology to raise these chicks under scavenging system, they are not getting success. If brooding behavior of the hen can be exploited, there may come one solution from the farmers' own system. Therefore, this study was designed and conducted in the Institute of Agriculture and Animal Science (IAAS), Rampur, Chitwan, Nepal with the following hypothesis and objectives:

Hypothesis:

1. Brooding hen accept and raise foreign chicks (improved chicks) after certain days of brooding stress.
2. In very small-scaled production system, chickens raised under scavenging environment with mother hen are more economical than confined intensive management.

Objectives:

1. To know the minimum days of brooding required by the local hen to accept and raise the foreign chicks under scavenging environment.
2. To compare the weight gained and net returns of scavenging birds with intensively managed confined birds.

Methodology:

Expt. 1: Seven local, Sakini hens, raised under scavenging environment were selected for the experiment. Their behavior was studied from beginning to the end period of laying. At the end of laying, each hen were

provided individual nest to warm. Eight eggs were given to each hen to incubate. Day old foreign chicks replaced all hatching eggs of experimental hens at dark night, starting from the brooding duration of 18 days. Based on the positive responses of the first brooding hen to the introduced chicks, hatching eggs of second, third and fourth hens were replaced by improved chicks at the end of 12, 9 and 3 days brooding period respectively. Each hen was supplied day old improved chicks (10) obtained from the local hatchery. The least duration of brooding, at which the hen accepted the foreign chicks was replicated four times to reduce the chance error.

Expt.2: Each mother hen with 10 accepted chicks were kept together for one day with ad lib. supply of commercial feed but onward second day, they were allowed to scavenge on the ground and field. During this scavenging period, teaching –learning behavior of mother hen and chicks were studied. The chicks with mother hens were scavenged for 8 hours (from 8 - 16 hrs) per day. In the initial 17 days, the scavenging chicks were supplemented small amount of feed in the evening and morning but onward 18th day, only small amount of maize grit was supplemented to bring the experiment nearer to the existing local system. In total, 40 scavenging chicks were taken under production performance measurements. At the same time, 10 improved breed chicks were raised under confined environment with intensive management. At the age of 68 days, the weight gain and feed consumption of both groups were measured. Using local market price, average total and net returns of each groups were compared.

Results and conclusion:

Expt. 1: Out of 10 Local "Sakini" hens raised under scavenging system, seven were taken for experiment. At matured stage, the wattles and comb of each hen changed to bright rose red. They produced " katyans, katyans " sound to call male for mating. After each laying, each hen left from the nest producing similar "Katyans" sound and accepted male for mating. They walked together with male. Male used to hunt insects and call females producing special "Kutkut" sound for mating. This behavior

of cockerels and hens was similar during the whole laying period but at the end of laying period, all hens disagree to walk with male. They spread their feathers and moved fast away from the males. Each hen produced "Kutkut" sound but it was different than the sound produced by the male. They started to warm their individual nest. With provided disturbances, each hen used to be helpless and produced weeping sound "kyan". During incubation (brooding) period, she used to go out from the nest once a day to get some feed and water. Within one hour, she used to return back to the nest and incubate eggs.

At night of 18 days brooding, hatching eggs of first experimental hen were replaced by improved breed, day old foreign chicks and she accepted them as her own. Similarly, hatching eggs of second, third and fourth hens were replaced by foreign chicks at night of 12, 09, and 03 days brooding duration respectively. All hens accepted foreign chicks up to 03 days brooding level. This 03 days brooding level was replicated 4 times to reduce the chance error. The results of experiment one are summarized in Table 1.

Table 1: Responses of brooding hens of different brooding level to introduced foreign chicks

Brooding level	Incubation duration to replace hatching eggs by foreign chicks (days)	Experimental hens	Response of hens to introduced foreign chicks
1	18	01	Accepted as her own
2	12	01	Accepted as her own
3	09	01	Accepted as her own
4	03	04	Accepted as their own

This part of experiment showed 03 days duration of brooding is favorable to generate brooding stress to the hens in order to accept foreign chicks as their own. It was one of the exciting results to the researcher because it can reduce the risks of getting fewer chicks from natural brooding and incubation duration can be saved by 18 days but hatching eggs were wasted. Just for information, it was also observed that one hen allowed to warm the nest without giving eggs also accepted foreign chicks at 10

days brooding level. Due to the shortage of fund and time, it could not be replicated and further studied. If such hatching eggs saving mechanism are developed, it can be an additional contribution to child nutrition because saved eggs will be available to the children.

Expt.2: Each hen with 10 foreign chicks were kept together in confined room for one day with ad lib. commercial feed and onward second day, they were allowed to scavenge on the ground. At that time, mother hens always guarded their young chicks. They produced special sound for danger notification and protect baby chicks from the possible predation by enemies. They also taught the baby chicks about feed search and capture methods. Finally, all baby chicks became able to search and take feed and to escape from their enemies. Beside this, mother hen used to protect their chicks from cold stress by covering them with feathers. By these observations, it is concluded that brooding hens make their baby chicks able to survive under scavenging system. Finally, scavenged chicks were compared with intensively managed chicks. Results are summarized in table 2.

Table 2: Improved chicks under scavenging vs. intensive management system in Nepal

Activities	Intensive system n=10 (A)	Scavenging system n=40 (B)	Differences (A-B)
Average weight gained in 68 days (g)	1940	1040	900
Feed consumption in 68 days (g)	6800	700+2400	3700
Average returns per bird US \$	1.80	1.78	0.11
Variable cost per bird US \$	1.31	0.35	0.96
Net returns per bird US \$	0.49	1.43	- 0.96

Each scavenging chicks consumed about 700 g feed for initial 17 days and about 2400 maize grit from 18 to 68 days time duration. In this period, the mother hens ate some amount of feed and that was not

reduced in this calculation. Feed consumed by each confined bird was about 6800 g but that of scavenging bird was only (700+ 2400) 3100 g. The scavenging birds were supplied very small amount of feed / feed stuffs, only in the morning and evenings but confined chicks were provided ad lib. feed. The main feed sources of scavenging birds were kitchen wastes, insects, fly maggots, threshing and cleaning wastes of cereals which were costless.

In 68 days, the average weight gained by the confined chicks was 1940 g, which seems to be lower than the standard weight gained of Hubbard chicks (2250 g) in 42 days age (Hubbard-isa.com/isa20.htm) and that of Shaver Manibro 2108 g (Korol, et al., 1996). It may be due to the poor quality feed and high temperature stress. The control birds were kept under the zinc roof and inside were very hot but temperature was not measured. There was death of one well-grown chick of 2400 g weight due to the high temperature stress. The average live weight gained by scavenging birds was almost half of the confined chicks (1040 g). That may be due to large amount of energy spent on feed search, hunting insects, walking and escape from the enemies. These chicks were scavenged in a small garden area so; feedstuffs available were not enough for such a large no of chicks. These may be the reasons for slow growth of the scavenging improved chicks.

Nepalese local poultry consumers preferred meat from scavenging chicks than confined. They also accepted such cockerels for religious use. So, market price of scavenging chicks became double. Due to this higher market price, average returns obtained from scavenging chicks became almost same with confined. Cost involved to produce scavenging chicks was very low because huge part of feed cost was reduced. Finally, net returns from scavenging bird became many folds higher than the confined. Therefore, for very small-scale poultry production, improved chicks raising under scavenging system by using brooding hen became more profitable than intensive management under confined environment.

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