



Characteristics of Geese Production and Management in the Valley of Kashmir

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ABSTRACT

The study was conducted in geese-rearing districts of Kashmir valley, India with the aim of studying various characteristics of geese production and management. Geese-rearing was recorded to be the primary occupation of 6.56% of farmers. Out of the total, 23.73% rearers were landless and kept geese as a subsidiary source of income. Three diverse production-systems viz. backyard (56.45%), semi-intensive (33.87%) and extensive-system (9.68%), were being practiced. Different types of houses included separate-sheds (50.00%), separate pen/cage (26.67%) and pen underneath the farmers' house/veranda (23.33%) with only 76.47% farmers using litter-material. Feed was offered in a large bowl, on floor and on a polythene-sheet by 8.62%, 29.31% and 62.07% farmers respectively. Types of incubation nests included grass-nest placed on floor (57.41%), basket-nest (27.78% farmers) and colony-nests (57.41%). Average number of eggs set for incubation was 9.531 ± 0.282 and age of eggs kept for incubation averaged to 24.167 ± 1.923 days. 88.24% farmers practiced custom of placing an iron-sickle underneath the straw-bedding of the nest. Goslings were allowed to go into the water after 10.878 ± 1.497 days of hatching. Eggs were mostly kept for incubation while geese were sold as well as consumed by the family. In villages geese were being marketed at the farmer's door-step and in city, middlemen played a role in the marketing. It was concluded that geese-farming promises a good future in an area where water-bodies are available in plenty and rearing is carried out on a large scale adopting an extensive-rearing and free foraging feeding system.

Keywords: Feeding, geese, housing, incubation, production

Geese were one of the first animals (Buckland and Guy, 2002) and bird species (Deffarges, 1973) to be domesticated by man, though there are conflicting reports in literature about the era of their domestication. According to Buckland and Guy (2002), its domestication took place in Egypt about 3000 years ago although Labatut (2002) dates their domestication back to the Neolithic period approximately 20,000 years ago, where as various other authors have mentioned the domestication of Egyptian goose, *Alopochen aegyptiacus* to have taken place in Egypt in the 3rd millennium BC (MacDonald and Bench, 2000). Historical and archaeological sources suggest that

in the 13th and 14th century goose husbandry was at its peak. Large flocks of birds were kept in the countryside by peasants, while occasionally individual birds would be reared in towns (Albarella, 2005). Geese are both popular backyard companions as well as produced commercially in specialized farms and are found all over the world, but at present goose farming is economically important only in Asia and Central Europe. Besides supplying nutritious meat, huge eggs and rich fat for cooking; they also provide soft down and feathers for bedding and clothing, which makes them particularly appropriate for providing farmers with a supplementary income and much needed animal

protein for family. They are grass foragers and unlike chicken do not compete with humans for grains. The high juvenile growth rate (Hamadani *et al.*, 2014) and likable quality of meat (Hamadani *et al.*, 2013a) of geese make this enterprise a promising one. At same time goose production can provide alternatives both to the poultry producers as well as consumers. In spite of all these advantages, domestic geese have remained a neglected species in many countries including India to the extent that not even basic statistics are available. Lack of scientific knowledge on all aspects of geese production and management are some of the major impediments in development of geese production. Perusal of literature reveals meagre scientific studies being carried out on geese across the world. In view of the above discussion, a study was planned with the objective of studying various characteristics of geese production and management in the Valley of Kashmir.

MATERIALS AND METHODS

Area of study

The study was conducted in three districts of the Kashmir valley viz. Srinagar, Bandipora and Ganderbal. Geese rearing areas which were found to be predominant in and around the water bodies (Hamadani *et al.*, 2013b) like Dal, Nigeen, Wular, Manasbal and Anchar lakes, and River Sind were frequently visited. In district Srinagar the areas visited included Tailbal area, hamlets along Northern Foreshore road, areas in the interiors of Dal and Nigeen lakes, along the Hazratbal-Nigeen road; and in the areas along the Anchar lake namely Omerhair, Buchopra, Jinab-Sahab, Soura and Rathpora Eidgah. In Bandipora, the areas around Wular lake mainly Haajan and Laharwalpora and areas around Manasbal lake were surveyed. Similarly in Ganderbal district, Shalbugh area, localities along the river Sind and around the parts of Anchar lake falling in the district were surveyed.

Research methodology

An extensive survey was carried out in these areas to document rearing practices on basis of the interview schedule using a pre-tested questionnaire primarily based on the questionnaire devised by National Bureau of Animal Genetic Resources. The same was modified

to fit the local conditions and the species being studied. 112 geese rearers were selected by multi-stage stratified cluster sampling technique. The selected farmers were interviewed and information regarding the rearing systems, housing systems, feeding and watering details, incubation practices, gosling care, identification method, criteria for sex determination, disposal of produce and other details was obtained. Socioeconomic status of the geese rearers was also documented on the basis of their occupation, geese flock size, land and livestock holdings.

Statistical analysis

The data was tabulated, classified and analyzed as per Snedecor and Cochran (Snedecor and Cochran, 1980).

RESULTS

Socio-economic profile of the geese rearers

Diverse occupations were been practiced by the geese rearers in the areas surveyed. Goose rearing was the primary occupation of 6.56 % of the farmers covered under study. Remaining 93.44 % of the farmers who kept geese had varied primary occupations (Table 1) and kept geese either as a sideline or hobby, as had also been reported in all parts of the United States, where geese are also reared as a side venture, hobby or for ornamental and exhibition purpose (Ensminger, 1993).

Table 1: Occupational status of geese rearers

Occupation	Percentage of geese rearers (%)
Geese farmer	6.56
Agricultural farmers	37.70
Fishermen	9.85
Labourers	16.40
Sand dealers	4.92
Government employees	3.28
Basket weavers	1.64
Vendors/shopkeepers	6.56
Shikaramen	3.28
Gardeners	1.64
Carpenters	1.64
Businessmen	4.92
Butcher	1.64

Land holdings among the geese farmers ranged from 0.12 to 3.10 acres. The distribution of land holdings amongst the remaining 22.81% farmers, who owned land is given in Table 2. Most of the surveyed geese rearers (23.73%) in the present study were landless and kept geese in addition to other livestock, as a subsidiary source of income.

Table 2: Land holding status of geese rearers

Parameter	Proportion of geese rearers (%)
Land ownership status	
Landless Farmers	77.19
Farmers owning land	22.81
Land (acres)	
Less than 0.12	27.59
Less than 0.62	73.68
Less than 1.24	21.05
Less than 1.86	46.43
More than 2.48	1.75

Overall geese flock size at the time of survey averaged to be 41.1 ± 9.49 birds with distribution within the districts depicted in Table 3.

Table 3: District wise distribution of geese flock size distribution

District	Average number	Percentage (%)
Srinagar	13.038 ± 2.691	14.97
Ganderbal	8.416 ± 1.648	4.46
Bandipora	67.592 ± 21.15	80.57
Overall	34.8 ± 9.49	100

Livestock other than geese kept by the farmers included cattle, sheep, goats, chicken, ducks, horses and pigeons with average number and proportion presented in the Table 4. In Asia, geese rearers are mostly small farmers and geese form an important livestock commodity for them (Yuwanta, 2002).

Rearing systems

Three diverse systems of geese-farming viz. backyard, semi-intensive and extensive system, were being practiced by the farmers interviewed during the survey. Some of the farmers (56.45 %) who had small flocks (<10 geese), kept their geese confined to their backyards. The geese were confined to shelters during the night while they were let

out during the day time. Another group of farmers (33.87 %), having medium flocks (11 - 100 geese), let out their geese in the nearby water bodies during the day time and during the night hours, geese were kept inside the shelters, and the third group of farmers (9.68 %), with large flocks (>100 geese), let their geese out in the water bodies for months together and brought them home at the time of laying or during floods and in winter months.

Table 4: Livestock other than geese kept by farmers

Livestock species	Average number of livestock	Percent of total farmers (%)
Cattle	2.72 ± 0.257	77.19
Sheep/goat	10.27 ± 4.3	27.59
Chicken	9.25 ± 1.513	73.68
Horse	1.42 ± 0.193	21.05
Duck	6.8 ± 1.355	46.43
Pigeon	100 ± 0.0	1.75

Literature reports about geese rearing as a backyard activity using cheap and locally available feed stuffs, as most of the farmers cannot afford to buy commercial complete rations for their geese are available in plenty (Demir and Elmali, 2012). Semi-intensive system mostly predominates in Poland (Rosinski, 2002) and West Bengal (Banerjee, 2013), while as extensive system is predominant in Kras region of Turkey (Demir and Elmali, 2012).

Housing details

Different types of houses were used by the farmers to provide shelter to their geese. Houses varied in type, shape and construction material. Three types of houses were being used by different farmers viz. shed type, separate pen/cage type and a pen underneath the base or veranda of the farmer's house. 50 % of the farmers used a shed type of house for their geese. Out of these, 26.66% farmers kept geese along with the other livestock in the same shed, with some kind of separate enclosure for geese. 26.67 % farmers housed geese in a separate pens or cages whereas pen underneath the base or veranda of the farmer's house was used by 23.33 % farmers to shelter their birds. The district wise distribution is given in Table 2. Varied shapes in the design of geese pens were seen varying from cubical, cuboidal to pyramidal. Different types of materials were used in the construction of these

houses. Bricks, mud, cement, wood and wires were used in walls; with tin sheets, straw and polythene sheets used as the roofing material. Floor was made up of wood, mud or concrete. 76.47 % farmers used litter material on the floor while others kept their geese as such on the floor. The litter material used was grass, hay, straw, sawdust, sand, etc.

Yuwanta (2002) has reported a wide variety of houses with simple construction, having litter or slatted floor and constructed out of various locally available and inexpensive materials, being used for geese rearing in Asia. As observed in the present study, Ensminger (1993) have also reported geese being reared in colony houses, open sheds, barns. Use of small portions of the available livestock sheds and shelters for large domesticated farm animals for keeping geese has also been reported (Demir and Elmali, 2012). Though housing design plays an important role in the reduction of stress and improving both the level of production and reproduction (Yuwanta, 2002) but the cost involved in construction of poultry houses often forces the farmers to look for locally available and cheap construction materials, and compromise on the housing design, floor space and other requirements to the extent that multiple species are often housed together as was also observed in the present study.

Feeding and watering details

Feed was offered twice or thrice a day and included mostly rice and paddy. However kitchen waste and maize was also offered by some. Water caltrop was also fed to geese especially in the Bandipora district. Feed was offered in different ways. 62.07 % farmers used a large bowl for feeding their birds and 29.31 % offered feed simply on ground or floor. However, 8.62 % farmers offered feed on a polythene sheet laid on ground. Water was offered in bowls. The district wise distribution is given in Table 2.

Generally little care is given to feeds and feeding systems, and most of the farmers use locally available cheap feedstuffs like rice bran besides grass (Yuwanta, 2002). Various other feedstuffs depending upon the availability have been used for feeding geese, which include wheat, oats, barley, corn (Ensminger, 1993) dried grass, meat and bone meal, fish meal, soya bean meal, besides supplementation with dicalcium phosphate, salt, vitamins and minerals (Wyeld *et al.*, 1980). Various types of feeders

(shallow pans, feed hoppers, regular feeders, troughs and even mechanical feeders in commercial farms) and waterers (cup – type waterer, barrels and large tanks) have been reported to be used for feeding and watering geese (Ensminger, 1993).

Incubation practices

Goose was allowed to sit on eggs, in incubation nests, which varied among the farmers. 57.41% farmers prepared a comfortable nest made up of straw or dried tree leaves and placed them on the floor of pen for the goose to sit in, while 27.78% farmers made a cozier kind of nest, an incubation basket, which was a large willow basket filled with straw, in which the goose was allowed to sit on its eggs and this basket was then covered by placing another basket upside down over it. The district wise distribution is given in Table 5.

Table 5: Housing, feeding and incubation practices

Parameter	Percent of farmers (%)			
	Srinagar	Ganderbal	Bandipora	Overall
Type of house				
Separate shed	18.18	44.44	90	50.00
Separate pen/cage	18.18	55.56	10	26.67
Pen underneath veranda	63.64	0	0	23.33
Use of litter				
Litter used	50	81.82	91.67	76.47
Litter not used	50	18.18	8.33	23.53
Feeding system				
On ground/floor	19.05	36.36	34.62	29.31
In a large bowl	80.95	63.64	46.15	62.07
On a polythene sheet	0	0	19.23	8.62
Type of incubation nest				
Grass nest on floor	40	81.82	29.63	57.41
Nest in a basket or box	60	18.18	14.81	27.78
Colony nests	0	0	29.63	57.41

This type of incubation basket which was made up of willow, was seen to be replaced by a few farmers in Srinagar district with a foam or cardboard box. However, 14.81% of the farmers, which mainly constituted of the large scale geese rearers, used colony nests comprising multiple square wooden enclosures (number depending

upon the size of flock) inside the shed. These enclosures were then filled with a comfortable bedding of grass, hay or straw, in order to function as incubation nest. Some farmers kept hen and goose in the same pen for incubating their respective eggs. Ensminger (1993) have also mention about the goose nests being made either on floor of the house or in coops, boxes or barrels, placed in the yard. The authors also describe the making of multiple nests by the use of partitions in the larger nest.

88.24% farmers practiced the custom of placing an iron sickle underneath the straw bedding of the nest. Such a practice was prevalent because of the farmer's belief, that if an iron sickle was not placed, then thunders would spoil the eggs and hamper hatchability. Practice of placing an iron sickle underneath the straw bedding of nest for incubating chicken eggs in Kashmir has also been reported by Ganai *et al.* (2005).

During incubation, goose was fed on alternate days by the surveyed farmers of Kashmir. Alternate feeding was preferred over daily feeding in order to restrict the broody goose's movement during incubation. However, Wyeld *et al.* (1980) has recommended that goose should be fed once a day during the incubation period.

All the interviewed farmers, used goose to hatch geese eggs and kept an average of 9.531 ± 0.282 eggs under each goose and age of eggs kept for incubation averaged to 24.167 ± 1.923 days. Since geese do not lay eggs during incubation, the total number of eggs laid in a year is lower, which is economically not a preferred choice (Demir and Elmali, 2012), so many goose breeders prefer to set goose eggs under chicken, turkeys or ducks, allowing goose to lay eggs (Ensminger, 1993). In such case, these authors have reported setting of 4 – 6 eggs under hen and 10 – 12 under a turkey or a duck. They also reported turkeys and Muscovy ducks better than chicken for hatching goose eggs because of being larger in size. However, Bihaqi (2012) reports hens being used for incubating duck eggs in Kashmir.

Care of goslings

Present survey revealed that goslings were kept along with their mother and were allowed to go into the water only after 10.878 ± 1.497 days of hatching. Goslings were fed rice, besides allowing them to nibble grass as well by

the geese rearers of Kashmir. Under natural conditions, goslings reared by the goose remain with the flock until the next breeding season, when the old birds drive them away (Wyeld *et al.*, 1980). The same author reports that goslings given a chance start grazing before they are 24 hours old, and if on ample high quality close growing herbage do well with little additional feed.

A box or a bucket containing some soft bedding material usually hay was used to carry goslings from one place to another as reported by the farmers in the present survey. Much like the geese rearers of Kashmir, 82.8 % farmers of Kras (Turkey) keep goslings in a plastic or cardboard box containing bedding material such as feather or straw (Demir and Elmali, 2012).

Methods of identification

Under free range conditions, where geese belonging to a number of people are on the same range, identification is important to determine ownership of the individual geese (Buckland and Guy, 2002). The most common identification method used by the geese rearers in Kashmir to identify their geese was the use of different types of markings on the webbed toes which included making slits or punch holes at different locations in the webs and nail removal of different digits. Few farmers were also seen to wound thick aluminum wire around the shanks of their geese. All these methods were used in different combinations as well. However, most farmers preferred slits over punch holes, giving the reason that punch holes could be easily manipulated and converted into slits in order to modify the identity of geese and hence the ownership.

Other practices

Other practice, prevalent among the surveyed farmers was trimming of the wings and tail feathers in more aggressive males. Wing clipping has also been reported to be practised in Canada geese (Ensminger, 1993).

Disposal of produce

Geese were reported to be reared for meat and eggs. Eggs produced were mainly used for incubation, similar to the reports of Juodka *et al.* (2012) among the farmers

of Lithuania and rarely the excess eggs were sold or consumed by the family. Adult birds were sold at the age of 12 months and were also being consumed by family at special occasions like festival of Eid and after the harvest in autumn. Male birds were mainly preferred to be sold by the owners but when in excess female birds were also sold. But as per Wyeld *et al.* (1980), in goose production, greatest profit is made by those who hatch, rear and sell goslings at 2 - 8 weeks of age. Demir and Elmali (2012) reports that 48.4 % farmers in Kras (Turkey) consume geese meat with their family members especially in the months of October and November, while 51.6 % sell the goose meat.

The reason for consumption of geese after harvest in autumn is the fattening of geese that has occurred by this time due to the availability of good quality fodder. Selling of geese at the time festival is for the reason of fetching higher price at that time. As has been reported by Ensminger (1993), the highest prices are being fetched at Christmas and Thanksgiving.

Marketing

In the present study, geese were being sold at farmer's doorstep in villages and at 2 places viz. Batmalloo and Lal-chowk in Srinagar city with middle men playing an important role in marketing. Ensminger (1993) have also regarded large cities as the best markets for geese. Much like the reports of Demir and Elmali (2012), our study also revealed that geese were sold both live as well as slaughtered. The involvement of middlemen often results in siphoning away major part of earning from basic producer. Wyeld *et al.* (1980) has therefore suggested direct sales to consumers and retailers for maximizing the returns. At the market place, geese were housed in multi-tier cages.

CONCLUSION

It was concluded that geese-farming promises a good future in an area where water-bodies are available in plenty and rearing is carried out on a large scale adopting an extensive rearing and free foraging feeding system, demanding meager investment on feed and housing and in return provides a supplementary source of income to the farmers, provided marketing is properly channelized.

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