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Socio-economic status of duck farmers and duck rearing system in India: A review

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Abstract

Duck is the one of the popular poultry bird mostly reared by the farmers in rural part of India. Duck is suitable for the places with abundant water resource i.e. pond, lake etc. Desi ducks are disease resistant and more acclimatised in comparison to exotic duck breeds. In duck rearing system, housing, nutritional management, hatchability percentage, overall health management, care and management of ducklings are very much crucial for acquiring optimum return in terms of egg and meat. Keeping the present duck rearing scenario in view, this review article enlightened on the duck rearing practices, socioeconomic condition of the duck rearers, production performance, incidence of diseases and health management of indigenous ducks in India.

Keywords: Duck, egg, housing, hatchability, nutrition

Introduction

Ducks were first domesticated almost 4000 years ago in Southeast Asia, during the Neolithic Age, followed by the Romans in Europe and the Malaysia in Asia [1, 2]. Different varieties of ducks especially domesticated ducks were developed from the Mallard [3]. Wild Mallards were monogamous while domestic ducks are mostly polygamous [4]. It is said that during the Ming Dynasty in China, the Peking duck developed from ancient Mallard breed of duck by force feeding grains, making them larger [5]. Breeding under intensive system started at ancient Egypt [6].

In India, there is no guided breeding and scientific management practices followed in duck rearing in the rural environment due to various difficulties. Scientific breeding strategy and management practices can prevent the unplanned breeding that is going on over years which led to sufficient genetic erosion of rich native duck germ plasm and degeneration of these native duck breeds become threatened for its existence. Scientific studies ultimately help to formulate proper nutritional and managerial approach to explore the capabilities of native ducks [7, 9, 12]. In India, there are lacks of sufficient scientific information of phenotypic or genotypic characteristics of various indigenous duck breeds or distinct varieties.

Demographic distribution

In India, distribution and demographic dynamics of duck population revealed that they are mainly concentrated in Eastern, North Eastern and Southern states. West Bengal, Assam, Kerala, Andhra Pradesh, Tamil Nadu, Bihar and Orissa are the leading states in duck population [8]. In India, North eastern region are rich of repository of duck genetic resources and endowed with abundant marshy, watershed areas created adequate environment for aquatic creatures to thrive well, abundant feeds for ducks which made easy to rear ducks as well as maintain ecological values and socio-economic balance [7, 9, 12].

Traditional duck farming system in India

Duck farming is considered as a subsidiary source of income and generally it is reared for meat, eggs and ornamental purpose. It secures the monetary assistance during any sort of financial problems in the home [10, 11]. In India, Duck production is lacking behind in terms of popularity like chicken and duck farmers are only found among the farmers of the Indian villages [8]. The indigenous breeds of ducks have innate potential to produce eggs and meat with giving lesser input than other exotic breeds [12].

Status of poultry population in India

The total poultry population in the country is 729.2 million, while fowl shares 95% of poultry sector, 3% Duck and 2% by Turkey, respectively. The reduction of the duck population in India from 2007 to 2012 is 14.86% [from 276.43 million to 235.39 million]. In Northeast India, Assam shares 3.73% among 95% of poultry birds over all India. In Assam from 2007 to 2012, there was reduction of poultry birds by 6.35%. India ranks 2nd in the World in terms of duck population [13]. Among total egg production by the duck breeds in India, 91% of eggs are produced by the indigenous duck and only 9% eggs are produced from 'improved' varieties [14]. As per 19th Livestock Census [15] of India, "Desi" and 'improved' ducks laid more than 100 eggs in a year and there are 3.7% improved strains of ducks whereas in North-eastern India, improved strains of ducks are 7.86%. The total population of duck in North-eastern India is 63, 90,742. The state wise duck population (in thousands) is presented in Table 1. The population of duck in Northeast India decreased by 14.86%, between 2007 to 2012.

Table 1: Details of backyard poultry in rural areas for ducks

Sl. no	State/UT	Ducks		Total
		Desi	Improved	
1	Andaman & Nicobar Islands	42371	22983	65354
2	Andhra Pradesh	147110	4460	151570
3	Arunachal Pradesh	41453	6756	48209
4	Assam	5378755	132758	5511513
5	Bihar	180652	52438	233090
6	Chandigarh	0	0	0
7	Chhattisgarh	107999	13731	121730
8	Dadra & Nagar Haveli	2214	4020	6234
9	Daman & Diu	376	6	382
10	Goa	321	62	383
11	Gujarat	11468	837	12305
12	Haryana	843	473	1316
13	Himachal Pradesh	457	211	668
14	Jammu & Kashmir	59336	2837	62173
15	Jharkhand	301179	17573	318752
16	Karnataka	4513	948	5461
17	Kerala	403285	362895	766180
18	Lakshadweep	589	294	883
19	Madhya Pradesh	13381	3097	16478
20	Maharashtra	43512	6107	49619
21	Manipur	113134	96152	209286
22	Meghalaya	15442	19163	34605
23	Mizoram	1265	1990	3255
24	Nagaland	35870	20227	56097
25	NCT of Delhi	888	248	1136
26	Odisha	175046	4131	179177
27	Puduchery	5746	573	6319
28	Punjab	2403	784	3187
29	Rajasthan	2136	1342	3478
30	Sikkim	668	19	687
31	Tamil Nadu	151282	23161	174443
32	Tripura	439469	87666	527090
33	Uttar Pradesh	131272	47477	178749
34	Uttarakhand	12633	2688	15321
35	West Bengal	4440614	272987	4713601
	Total	12267682	1211094	13478731

(Source: 19th Livestock Census, 2012)

Duck rearing system and socio-economic background of duck rearers

As per Narahari [16], duck rearing has many advantages than chicken rearing. Ducks are more prolific, longer productive

life, produce more numbers of egg and bigger in size (10-15 gram) in comparison to backyard chicken. Feed cost is comparatively lower than chicken as ducks collect their major feed by foraging. Ducks are quite intelligent birds as they can be easily trained for their daily routine i.e. going to ponds, feeding etc and ultimately reduces the labour cost. Marshy, swampy river side, wet lands, barren lands are only suitable for duck rearing. Duck farming and paddy cultivation easily can be integrated and can use their symbiotic relationship among both farming. Ducks lay their eggs during early in the morning and saves time and enables easy egg collection. Ducks are quite hardy birds and resistant to common avian diseases.

Irrespective of religion, education, occupation and economic back ground, all strata of the society are involved in the rearing of ducks. In Assam, majority of duck rearers are belonging to Hindu community. One third of duck rearers are illiterate and others studied up to primary level. They got knowledge of duck rearing from their ancestors [10]. In another study, Ravindran [17] reported that duck rearers in Kerala are mostly belonging to the Christian community. Similarly, Ritamber [18] reported that people belonging to back ward and schedule tribe in Andhra Pradesh took duck farming as a family profession. Banerjee [19] and Reena [11] also reported that most of the duck rearers in West Bengal and Odisha, belong to economically challenged section of the society and are unable to provide much needed balanced nutrition, proper management and health services to the ducks.

Hoque [20] and Banerjee [19] stated that women in West Bengal are mainly involved in the husbandry practices, sales of eggs and duckling whereas male members are mostly involved in construction of house for ducks, sales of adult ducks, health care management. The farmers for duck rearing mainly depend on the scavenging system or free ranging system. The ducks are mostly fed with leftover feed of household or kitchen waste with addition of some concentrate like rice bran, rice mixed with rice gruel along with foraging facilities in water bodies either privately owned or communal in nature [11, 19]. In Assam, ducks left in the noon time for scavenging under the supervision of an attendant. During night, ducks were kept in an elevated area surrounded by paddy field. Similar pattern of rearing system observed in Andhra Pradesh [18]. Only 8% of farmers in Assam adopted duck cum fish farming system [10, 21]. In Andhra Pradesh, Kerala and Tamil Nadu, during draught period, adult ducks are fed with locally available feed ingredients and took ducks to remote places for foraging [10] whereas desi ducks of Odisha met their nutritional need by scavenging only [11]. In Kerala, during post harvest time of rice, ducks are reared on paddy fields and they get fish, snail, insects, grains etc [10, 17, 22, 23]. In Tamil Nadu, farmers provide feed as per age [23]. Occasionally, depending on the availability, ducks are also provided with molluscs and other aquatic snails [19, 20, 24, 25]. Availability of the molluscs varies from location to location as the quantity of molluscs is decreasing due to extensive use of agrochemicals which diminishes aquatic fauna and flora and sometime causes poisoning to the ducks [10, 11].

Water is seldom provided to the ducks and geese and they drink from the ponds and water bodies, [26, 29]. Ducks are mostly reared adjacent to the home. Houses for the adult duck mainly made up of tins, bamboo, sometimes completely made up of GI sheets. Floors are located high above the ground which also made up of bamboo and corrugated sheet. Doors are closed during the night time to save ducks from predators.

The young bird/ ducklings are reared separately, mostly under bamboo baskets or under the mosquito nets so that they remain protected from predators until they are strong enough to accompany the older flock and protect themselves [11, 20, 29]. Farmers who could not build permanent shelter for ducks, used to keep in the pen made up of bamboo-rice straw covered by tin-shed and soil. Similar housing conditions are observed in Odisha, West Bengal [19, 29, 30]. In some places of Bangladesh permanent house for ducks are made up of mortar and bricks [25, 31].

In North East India, at the age of one week ducklings are allowed to swim in the water bodies and after 15 days they are allowed to forage independently with their mother [10]. 15 days old ducklings without any artificial heat source are confined in a specially designed separate enclosure which is made up of bamboo or wooden boxes. Sexing of ducklings is carried out at 3-4 month of age. Almost same rearing system is reported from Kerala [17].

Duck rearing is largely varied from location to location, farmer to farmer depending upon the economical strength of the family along with availability of water resources for foraging of duck. Flock size can vary from 2 to 9 ducks per household, average flock size 5.3 ducks per household [19, 20, 29]. In Odisha, flock size of desi ducks varies from 9 to 30 [11]. In Assam flock size ranges from 20-50 and it may range up to 20-200 [10]. Mahanta [21] observed 5- 100 flock size in few districts of Assam and 200-300 in Tamil Nadu [32].

Production performance of duck

Age of sexual maturity [days] varies with the breeds such as in Pati it ranges from 225- 240 [10, 21], in Nageswari 180-195; in khaki Campbell 195-210; in Muscovy 300-315, in Geese 330-365; in desi ducks of Andhra Pradesh 240 [18]. Islam [10] reported that in Assam farmers used to maintain male and female ratio 1:5. Besides wider ratio, 1:10, or 1:30 also recorded by several authors [22, 18, 21]. Banerjee [19] and Reena [11] reported drake to duck ratio between 1:7-7.5. The wider ratio is due to selling of males at an early age for their meats [19]. Farmers used broody ducks or hens as natural incubator due to lack of artificial incubation system. Eggs generally set under each broody duck or hen ranges from 16-20 and 10-12, respectively [11]. In Kerala [33] and Tamil Nadu [32] 15-20 numbers of egg used to set for brooding. Generally candling is not practised [10] but Reddy [23] reported that candling can be done on 8th day by holding the egg against sunlight.

Hatchability percentage ranges from 50 to 75% in common ducks with an average 63% [10, 19, 25, 33, 34, 35]. Hatchability percentage as per farmers perspective is 80-90% when used broody hen [10, 33]. Hatchability % of eggs of Muscovy ducks vary between 45 and 75% with an average 55.5% [36]. Hatchability % varies from season to season [37-39] and least in summer months when temperature and humidity is in the peak level [19, 40, 41]. In ducks, hatchability is comparatively less than hens. As the night enclosure of ducks is mostly devoid of any proper nests, eggs are mostly laid on the ground and it remains wet, dirty and soiled resulting poor hatchability. Soiled eggs with poor hatchability are used for table purposes or sale [19, 41]. At village level, duck rearers are not financed by any finance agent or any government assistance [10, 11]. In Kerala, Andhra Pradesh and Tamil Nadu, duck rearers are financed by whole sale merchants [17, 18, 23]. Egg productions of desi ducks always low compared to crossbreds and exotic duck breeds. Annual egg production of Runner Duck is between 150-220 [average 180 eggs] [19, 42]; in Pati duck 75-95

[7]; in Muscovy ducks 20-40 [average 28 eggs] [19, 36]; in Nageswari 140-150; in Khaki Campbell 120-140; in Geese 20-25 [10, 11].

Incidence of duck diseases and health maintenance

Large water bodies in North-East India, West Bengal and other places attract the migratory birds which are the carrier of avian influenza and subsequently lead to reduction in duck population [19]. Local ducks are quite tolerant to many prevalent diseases; even though mortality mainly occurs due to duck plague hepatitis, botulism, plague and cholera [10, 21, 43]. Ducklings are more susceptible compare to adults. Higher mortality observed during monsoon season as the environmental temperature goes higher along with high relative humidity leads to disease like cholera and dysentery, while lowest mortality rate observed during spring and summer [19]. Average survivability for ducks varies between 40 and 80%, on an average around 65% [18, 19, 20, 23]. Higher mortality percentage observed by few authors and reported mortality among the ducklings varies according to season, housing, husbandry practices and varies from 30 to 70%, on an average around 55% [19, 36]. In duckling, mortality ranges from 10-15% while in adult duck it is below 10% [10]. In rural area, feeds are provided in earthen vessels which are seldom cleaned and become a major source of infection in the flocks. Farmers occasionally used live vaccine to their ducks against infectious diseases like duck plague. They usually treat their ducks with antibiotics, potash solution, local vodka, and black pepper [10, 18]. Very fewer farmers generally reports to the veterinary health centre and use the veterinary facilities until situation goes worse and increase in mortality rate [11]. While in state like Kerala, farmers used to follow their routine vaccination to their ducks [17, 22].

Contribution of duck in rural sustainable economy

In rural areas, every household used to rear two or more number of ducks for meat and eggs. The cost of duck eggs as well as meat fetch higher price than eggs and meat of hen. Interestingly, cost of local duck and eggs are even higher than the exotic breed of ducks [19]. Higher price of the local ducks is due to its taste, pigmentation and different traditional delicious cuisines items are being made from duck eggs and meat [11, 19, 25, 44]. Surplus eggs, growers drake, spent ducks are sold either in local market or neighbours or doorstep farmers or local traders [10, 45]. Reports from Kerala, Tamil Nadu, Andhra Pradesh reveals that egg production is the primary reason behind duck rearing [17, 22, 23]. In Andhra Pradesh for selling of eggs, two channel of egg marketing are followed i.e. producer-consumer and producer- middleman- consumer [46].

Conclusion

At village level, duck rearers are to be trained on daily care, management, de-worming, treatments, vaccinations, common duck diseases and application of advanced scientific methodology for augmentation of production. For enhancement of egg and meat production of the country, characterisation, identification and conservation of local ducks (local indigenous germplasm) needs to be carried out through scientific research.

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