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Rearing and Management of Quail (*Galliformes Spp.*) in Vidima Village, Dimapur, Nagaland



Lemzila Rudithongru

Student,
Deptt. of Zoology,
University of Science & Technology,
Meghalaya



Arup Nama Das

Assistant Professor,
Deptt. of Zoology,
University of Science & Technology,
Meghalaya

Abstract

Quail farming can be a great source of handsome income and employment opportunity in the state of Nagaland. Along with the economic importance quail farming is also very pleasuring and entertaining. Quails are very small sized poultry bird and their rearing system is very easy and simple. Quails are very suitable for commercial production of both meat and eggs.

Nagaland being one of the smallest states in India, with the total area of 16,579 sq km, majority of the people inhabiting there are still unaware of the important value of the bird, quail. And despite majority of the people's preferences being meat in this region, quail farming is still in its infancy since it is known by only around 5% of the local people.

Quails can adapt themselves very well with almost all types of climates and environment. And Nagaland is very suitable for raising quails commercially. Speaking about Nagaland's climate, it can be said that the state has quite a pleasant weather all throughout the year. The bracing weather makes it one of the most popular tourist spots in the Indian subcontinent. About 90% of the people of Nagaland are dependent on Agriculture. Rice and corn are the main crops. However the state is not self-sufficient in food. Shifting cultivation is widely practised. The forests which cover about 17% of Nagaland are its most important source of income. (Source-www.mapsofindia.com)

Over the last 50 years quails have been proved research animals. The most commonly used is the Japanese quail, *Coturnix japonica*. It's relatively short lifespan and physiological similarities to human makes it useful in the study of ageing and disease while its 16-day developmental period and easily accessible embryo make it a suitable model for developmental biology.

Keywords: Nagaland, Quail farming, Research Animals, Employment, Embryo.

Introduction

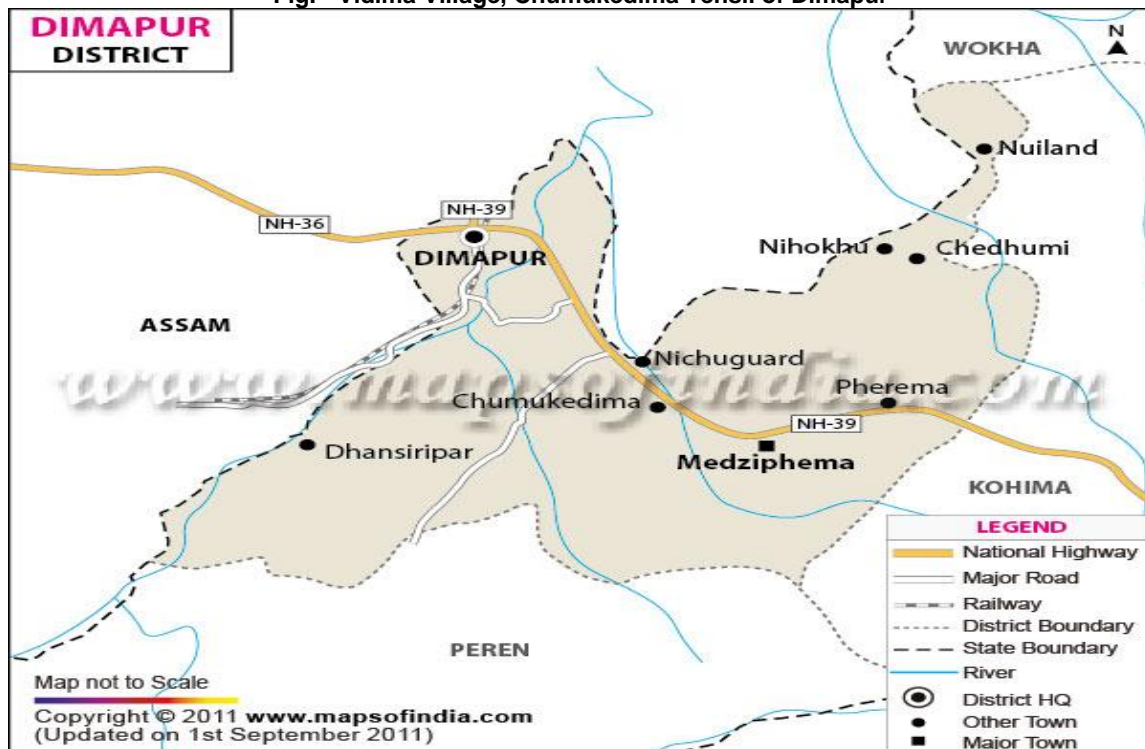
Study Area

Tucked away in the far north-eastern corner of India lies the mystical and beautiful hill state of Nagaland. The state is largely mountainous and Mount Saramati, at a height of 3,840 meters is the highest peak in the state. Agriculture is the most important economic activity of Nagaland and primary crops of the region are rice, corn, millets, pulses, tobacco, oilseeds, sugarcane and potatoes. Other activities contributing to the economy of the state are forestry, tourism, insurance and real estate. The state is bounded by Myanmar in the East, the Indian states of Assam in the West, Arunachal Pradesh and a part of Assam in the North, and Manipur in the South. The population of Nagaland is 1,980,602 (2011 census) and the state covers an area of 16,579 km².

Nagaland with eleven districts is one of India's smallest states. The state is located between the 93°20'E and 95°15'E Longitudes and 25°6'N and 27°4'N Latitudes. The state houses as many as 16 different ethnic groups. These groups of people have their own separate cultural identities which include customs, dresses and languages. The area of study was conducted in Vidima village which falls under Chumukedima Tehsil of Dimapur district in Nagaland, India and is located at Latitude of 93.72759 and a Longitude of 25.906267. It is situated 10km away from sub-district headquarter chumukedima and 12km away from district headquarter Dimapur.

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Fig. - Vidima Village, Chumukedima Tehsil of Dimapur



Aims of the Study

This project is carried out with the aim to study about the rearing and management of Japanese Quail (*Coturnix japonica*) in Vidima village, Chumukedima, Dimapur, Nagaland; keeping in mind the following objectives to assess:-

1. Types of species used for rearing/farming.
2. Commercial importance and demands.
3. Conservation status of the species

Review of Literature

The Japanese quail belongs to the order Galliformes, family Phasianidae, genus *Coturnix* and species *japonica*. Several aspects account for the utility of this bird. First it has attained economic importance as an agricultural species producing eggs and meat that are enjoyed for their unique flavor. Egg production is important in Japan and Southeast Asia, while meat is the main product in Europe. Second, the low body maintenance cost associated with its small body size (80-300g) coupled with its short generation interval (3-4 generation per year), resistance to diseases and high egg production, rendered it an excellent laboratory animal. Third, Japanese quail also is the smallest avian species farmed for meat and egg production. It has thus been used extensively in many studies. The Japanese quail is bred for egg and meat production. Few studies have been published on egg production, but reports on quail growth and body composition are numerous. Some of the estimated genetic parameters for various traits of Japanese quails were reported by several workers.

Japanese quail (*Coturnix japonica*) have become an important laboratory animal because of their small body size, sexual maturity in 6 to 7 weeks, high rate of reproduction, ability to produce 3-4

generations in a year and relative ease of maintaining the colony (Wilson, 1972). The earliest studies on the food habits of quail in their natural habitat were conducted by naturalists, Taka-Tukasa (1935), Stanford (1957), Toschi (1959) and Wetherbee (1961) have discussed the dietary preferences of quail. In general, in the wild, the quail preferred diets relatively high in protein in order to thrive and reproduce efficiently. The quail farmers in Japan have long been aware that domesticated species also required a higher level of protein in their diets than domesticated fowls (Howes, 1964).

The amount of food intake depends upon the metabolizable energy (ME) content of the diet, age of the birds, their reproductive status and the ambient temperatures. The required nutrient levels in a diet are dependent upon the ME content of the diet. The daily ME intake of growing quail in the studies of Farrell et al. (1982) was 239kj (57 kcal), 196kj (46.8 kcal) and 239kj (52 kcal) per kg body weight at 12, 19 and 26 days of age. According to Chinese literature, the history of quail domestication can go back to at least 1500 years ago (Chang et al., 2001; Chang et al., 2005). In Japan, quail has been domesticated since at least the 12th century AD, when it was kept as a songbird (Kovach, 1974; Kimura, 1996). The difference in size and shape between the domestic and wild quail reflects the effects of the domestication.

Methodology

The methods applied in this dissertation work were designed to collect information on the rearing and management of a particular species of quail, the types of feed for meat and egg, its commercial importance and demands, medicinal & nutritional importance, production in current year and its

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conservation status. The study was carried out in 'Tatami Integrated Farm', Vidima village which is located 12 km away from the district Dimapur and 10 km away from the sub-district headquarter Chumukedima.

The information was collected within the six months period, i.e., December 2016-May 2017. The area of study was surveyed through some questionnaires and interactions with the owner of the farm as well as with the local people. The data were also collected through colored pictures from the study area as well as from the market areas where the adult quails and the eggs were sold by the local people. The survey on the quail farm was taken from 12 noon till late evening at around 4:00pm where all the available information about the rearing of the poultry bird was provided by the owner of the farm.

Equipments

The equipments used for the survey were:

1. Digital Camera
2. Notebooks/Diary
3. Pen and Pencil

Observation

Through this survey, it has been observed that most of the tribe doesn't have much knowledge about the nutritional benefits and the commercial importance of this poultry bird. The quail meat and eggs contains certain types of vitamins because of which it is beneficial for expectant mothers. Other poultry birds like the hen and the ducks are said to cause jaundice to newborn babies, however, this quail bird does not cause such sickness, and it instead gives strength to the immune and enhances the brain activities

The benefits of quail eggs are considered to be one of the best known natural treatment products which are given as follows:-

1. They are a remedy against digestive tract disorders such as gastritis, stomach ulcer and duodenal ulcer.
2. It can help cure anemia, increasing hemoglobin level and remove toxins and heavy metals from blood.
3. It helps in the treatment of tuberculosis, bronchial asthma, diabetes and vegetative vascular dystonia.
4. It has strong anticancer effects and may help inhibit cancerous growth.
5. It helps eliminate and remove stones from liver, kidneys and gallbladder.
6. It may accelerate recuperation after blood stroke and help strengthen heart muscles.
7. They are a powerful stimulant of sexual potency. They nourish the prostate gland with useful substances, phosphorus, proteins and vitamins and therefore helps restore sexual potency in men.

Results and Discussion

Quails are often used in environmental toxicity testing. They eat many kinds of seeds and are used in palatability studies, which show the likelihood of, for example, a new pesticide, being eaten by birds. These birds also eat a variety of worms and insect larvae, and maybe used to study the potential effects

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of a chemical substance on the food chain. (Environmental Studies). Quail farming business is very easy, lucrative and entertaining. It's very easy to maintain quail farm, because quails are very small in size as compared to other poultry birds. The Japanese scientists first tamed the wild quails and revealed the ways to raise them as domestic birds. Commercial quail farming in Japan has spread tremendously. Quail farming business is now being performed throughout the world for the sole production of meat and eggs. The quail farming can play a vital role to meet up demand of food and nutrition because the quail eggs have a high content of protein, phosphorus, iron, vitamin A, B1 and B2. Quail farming business requires only a small capital and labor and can also be raised along with the other poultry birds.

The Japanese quail eggs are mottled brown colour and are often covered with light blue, chalky material. Each hen appears to lay eggs with a characteristic shell pattern or colour. Some lay only white eggs. The average egg weighs about 10 gram, about 8% of the bodyweight of the quail hen. Young chicks weigh 6-7 gram when hatched and are brownish with yellow stripes. The shells are fragile, so one should handle with care. Research indicates that grouping a single male with 2 or 3 females will generally give high fertility. This reduces the fighting among the males. Pair mating in individual cages also gives good fertility. Fertility decreases markedly in the older birds. Mating among closely related individuals causes interbreeding which results in the increased incidence of abnormalities and can greatly reduce reproductive performance. Therefore, it is desirable to record hen numbers on the eggs, incubate them in groups, and permanently mark the chicks at hatch time. Pedigree records can be kept by using commercially available wing bands or leg bands to identify quail of all ages.

Benefits About Quail Meat And Egg

(Source: Dr. Michael Iken, Visiting Specialist Consultant Animal Concern, 2013)

Quail meat is a sweet and delicate white game meat with extremely low skin fat and low cholesterol value. Quail meat is rich in micronutrients and a wide variety of vitamins including B-complex, folate and vitamin E and K. It is therefore recommended for people with high cholesterol levels and those who want to maintain a low level of cholesterol.

Quail eggs are very delicious and comparable in taste to free-range chicken eggs. Their nutritional value is 3-4 times higher than that of chicken eggs. Quail eggs contain 13% protein while chicken eggs have about 11% protein. Quail eggs have 140µg of vitamin B1, compared to 50µg in chicken eggs. Quail eggs are much richer in vitamin B2, iron, potassium, calcium and phosphorus than chicken eggs. Quail eggs are rich in HDL cholesterol, (the good cholesterol), so even senior citizen can eat them. Quail eggs have low cholesterol levels and are rich in choline, a chemical essential for brain function.

Some authors indicate that health benefits of quail eggs include:

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1. Arthritis
2. Gastritis
3. Treatment of anemia
4. Remove toxins and heavy metals from blood
5. Have strong anti-cancer effects, and may help inhibit cancerous growth
6. Nourish the prostate gland and may help restore sexual potency in men
7. Enhance good memory and brain activity
8. Strengthen the immune system
9. Slow down aging of organs
10. Strengthen heart muscle
11. Recent studies indicates that quail egg yolk rich in cholinesterase, may alleviate symptoms of Alzheimer's disease, and reduce risk of developing it
12. Strengthen hair and make it shiny
13. Improve skin complexion
14. The eggs are used for facial masks and hair care.

Project For 1000 Japanese Quail Bird Farming In Vidima Village, Chumukedima.

Monthly	1000 Birds
Yearly	12000 Birds
Every Month Marketing	1000 Birds
Yearly marketing	12000 Birds

Assumptions

Space Required	0.15 Sq. Ft/Bird
Construction Cost	Rs.100/Sq. Ft
10 Days Old Chick Cost	Rs.35/-
Price of Feed per Kg	Rs.40/-
Sale Weight{In 30 Days(40-10)}	200-250 gm
Feed Consumption	500 gm
Sales Price of Bird	Rs.100/-

Capital Investment

Cost of Construction of 150 Sq. Ft @ Rs. 100/- Sq. Ft	Rs.15,000/-
Cost of Equipment for 1000 Birds @ Rs. 2/- Per Bird	Rs.2,000/-
Total Capital Investment	Rs.17,000/-

Capitalized Expenses

Cost of 1000 Day Old Chicks @ Rs. 35/- Per Bird	Rs.35,000/-
Cost of Feed for 1000 Chicks @ Rs. 500gm Per Bird i.e. Total 500 Kg Feed @ Rs. 40/-	Rs.20,000/-
Cost of Electricity, Over Heads, Lights @ Rs. 2/- Per Bird	Rs.2,000/-

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Total Capitalized Expenses	Rs.57,000/-
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Project Cost

Capitalized Investment	Rs.17,000/-
Capitalized Expenses	Rs.57,000/-
Grand Total	Rs.74,000/-
Project Cost Per Bird	Rs.74/-

Operation Cost (Per Batch, Per Annum)

Cost of 1000 Quail Chicks @ Rs. 35/- Per Bird	Rs.35,000/-
Cost of Feeding 1000 Quail Chicks @ 500 gm Per Bird, Totally 500 Kg Feed @ Rs. 40/- Per Kg	Rs.20,000/-
Cost of Over Heads, Electricity, Labor Etc., @ Rs. 2/- Per Bird For 1000 Birds	Rs.2,000/-
Total Cost Per Batch	Rs.57,000/-
Total Cost for 12 Batches Per Year (Rs. 57,000/- x 12)	Rs.6,84,000/-

Income (Per Batch, Per Annum)

Sale of 1000 Quails @ Rs. 100/- Each Bird	Rs.1,00,000/-
Sales of 10 Gunny Bags @ Rs. 10/- Each One	Rs.100/-
Sale of Manure @ Rs. 0.5/- Per Each Bird	Rs.500/-
Total Income Per Batch	Rs.1,00,600/-
Total Income From 12 Batches Per Year (Rs. 1,00,600/- x 12)	Rs.12,07,200/-

Gross Profit Per Annum

Total Income	Rs.12,07,200/-
Total Expenditure	Rs.6,84,000/-
Gross Profit Per Year	Rs.5,23,200/-
Gross Profit Per Month	Rs.43,600/-

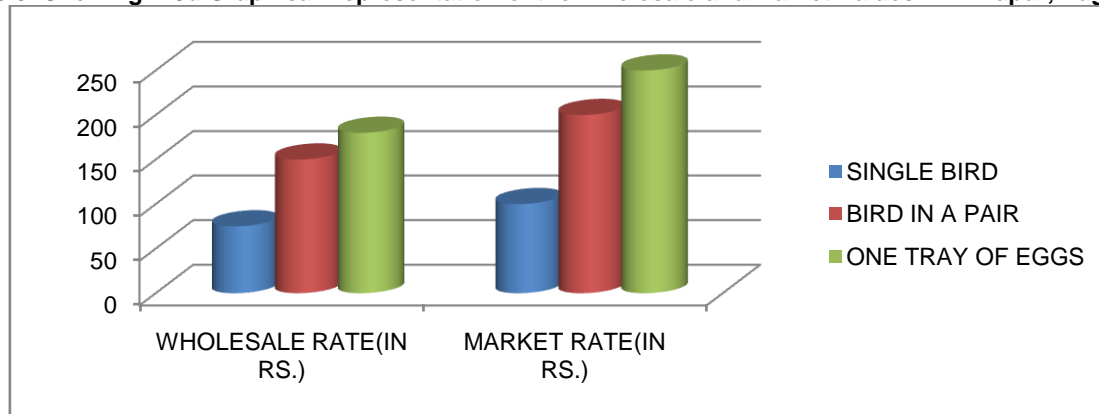
The values of Quail bird in Dimapur is given below-

1. Wholesale rate
 - Single bird = Rs.75/-
 - Bird in a pair = Rs.150/-
2. Market rate
 - Single bird = Rs.100/-
 - Bird in a pair = Rs.200/-

One tray of Quail eggs can hold 30 eggs.
The values in Dimapur are given below:-

 1. Wholesale rate of one tray of eggs = Rs.180/-
 2. Market rate of one tray of eggs = Rs.250/-

Fig.5.8- Showing A 3d Graphical Representation of the Wholesale and Market Values in Dimapur, Nagaland



Conclusion

The Japanese quail is considered a separate species from the common quail, *Coturnix coturnix* which is found throughout Europe, Asia, Africa & India and is not a close relative of either the American bobwhite quail, *Colinus virginianus* or the Californian quail in China during the 11th century, and to have been brought to Japan in the 12th century, where they were bred as domestic songbirds.

C. japonica was first studied described as a research model by Padgett and Ivey in 1959, who saw it as a practical animal for the study of development. In 1961 they published a detailed study of quail histology and breeding that provide reliable reference texts for researchers, and the Japanese quail has become a common laboratory species. So, the proper rearing and management of Japanese quail is very important for the sustainable development of local people of Nagaland and also it will certainly a source of proper nutrition for the society in association with other poultry products. This paper is a preliminary observation on the rearing and management of Japanese Quail for the better benefit of Mankind and development of rural society.

Reference

1. Baumgartner, J., 1994. Japanese Quail Production, Breeding and Genetics. *World's Poult. Sci. J.*, 50:227-235.
2. *Birds of India: Birds of Nagaland-an introduction*, 2011. Available from www.kolkatabirds.com
3. Caron et al., 1990. Mass Selection for 45-day Body Weight in Japanese Quail: Selection Response, Carcass Composition, Cooking Properties, and Sensory Characteristics. *Poult. Sci.* 69:1037-1045.
4. Chang et al., 2001. Study on Phylogenetic Relationship Between Wild Japanese Quails in the Weinshan Lake Area and Domestic Quails. *Asian Australian Journal of Animal Science* 14(5):603-607.
5. Chang et al., 2005. Developmental Research on the Origin and Physiology of Quails. Vol.61, Issue 1. Pp.105-112.
6. Couly, GF, Coltey, PM, Le Douarin, NM, 1992. The developmental fate of the cephalic mesoderm in quail-chick chimeras, *Development*.
7. D.K. Wetherbee (1961). Investigations in the Life History of the Common coturnix. *American Midland Naturalist* 65:168.
8. Farrell, D.J., Atmamihardja, S.I. and Pym, R.A.E. (1982). Calorimetric Measurement of the Energy and Nitrogen Metabolism of Japanese Quail. *British Poultry Science*, 23:375- 382.
9. Howes, J.R., 1964. Japanese Quails as found in Japan. *Quail Quarterly*, 1:19-30.
10. Imchen Michael, 2016. Benefits about quail meat and eggs(Nagaland Post).
11. *International Journal of Poultry Science*, 2008. Vol:7.
12. Jones R.B., 1996. Fear and Adaptability in Poultry: Insights, Implications and Imperatives, *World's Poult. Sci. J.*, vol.52 (pg.131-174).
13. Kimura M. 1996. Wild Quails. *Res. Anim. Prod.* 50:197-202.
14. Surehatch, 2013. *Incubator Terminology Explained*.
15. Joseph K. Kovach, 1974. The behaviour of Japanese quail: Review of literature from a bioethological perspective. *Applied Animal Ethology* 1(1):77-102.
16. K.F. Shim and Pran Vohra, 1984. "World's Poultry Science Journey"- Cambridge Univ. Press.
17. Laura F. Landweber and Andrew P. Dobson, 1999. "Genetics and Extinction of Species"- Princeton University Press
18. Maurice Randall and Gerry Bolla, 2006. *Raising Japanese Quail- The Poultry Site*.
19. Mike Beitz, 2017. Trillium Hatchery to Build \$20-million Chick Hatchery in Stratford's Wright Business Park. (*The Beacon Herald*, February8, 2017).
20. Mills, A.D., and J.M. Faure, 1992. *The Behaviour of Domestic Quail*. (Pg. 1-16).
21. Padgett, CA and Ivey, WD, 1959. *Coturnix Quail as a Laboratory Research Animal*, *Science*, vol.129, no.3344, pp. 267-268.
22. Pettingill, OS Jr., 1984. *Ornithology in Laboratory and Field*, 4 ed., pp. 357-360.
23. Royfarms, 2017. *Modern Farming Methods*.
24. Stanford, Jack A. 1957. A Progress Report on coturnix Quail Investigations in Missouri, *Trans..22nd North Am. Wildlife Conference*. pp.316-359.
25. Taka-Tsukasa, P. 1935. *The Birds of Nippon*, vol.1(4):204-238. H.F. and G.Witherby, Ltd., London.
26. *The Future Japanese Quail for Research and Production*. Available from: <http://www.researchgate.net>publication>.
27. Toschi, A., 1959. *The coturnix Quail: Life History, Rearing and Sport*. Laboratory Zoological Application Alacaccia. pp257. University di Bologna, Italy.
28. Warham J.,1990. *The Petrels- Their Ecology and Breeding Systems*. London: Academic Press
29. Wilson, W.O., Abbott, U.K. and Abplanalp, H. (1961). Evaluation of coturnix (Japanese Quail) as a Pilot Animal for Poultry. *Poult. Sci.*, 40:651-657.
30. W.O. Wilson (1972). A Review of the Physiology of coturnix (Japanese Quail). *World's Poultry Science Journal* 28:413.