UNIT 4 QUAIL FARMING

Structure

4.0 OBJECTIVES

After studying this unit, you will be able to:

- identify Japanese quail;
- plan the system of rearing of Japanese quail;
- manage and raise Japanese quail; and
- prepare products from eggs and meat of Quail and market them.

4.1 INTRODUCTION

Japanese quails (*Coturnix coturnix japonica*) are small flying birds weighing around 150 to 200 g. They make a peculiar sound and are considered a delicacy as a meat bird. Due to their small size, this bird is also used as a laboratory model of chicken and other birds. So, cost of conducting experiments can be greatly reduced because they eat less, need less space and reproduce faster than chicken. In addition, they are also easy to handle. With growing consumer awareness and appreciation for the quail's tender and tasty meat quality, the commercial quail production industry has gradually captured a sizeable section of the poultry meat market. In the figure below (Fig. 4.1), you can see a pair of Japanese quails.

Fig. 4.1: Japanese Quail

4.2 GENERAL FEATURES

There are many types of quails like the Chinese quail, Italian quail, Rain quail etc., but not all are domesticated. Most of the quails come under Wildlife Protection Act. Only the Japanese quails and the Bob white quail are allowed to be reared under captivity. In India, we have the Japanese quails which are gaining much importance and their eggs and meat are readily accepted by the common man.

Quails are also distinctly different from chicken because:

- They are very small compared to chicks; adults weigh about 10% of adult chicken.
- They do not have combs and wattles.
- They can fly.
- Mature by 8 weeks of age itself.

4.2.1 Advantages of Rearing

There are various advantageous in raising Japanese quails. The reasons for the popularity of Japanese quail farming are as follows:

- Does not require specially designed house as they can be comfortably reared even in vacant rooms meant for human habitation.
- The floor space requirement is much less, and the capital requirement therefore is much less.
- The quails are ready for the market as table birds at five weeks of age. The quail also starts laying from the sixth week.
- More resistant to diseases than chicken and do not normally require any vaccination, deworming, etc. such that their management is easier.
- Because of their smaller body size, the quails consume less feed and therefore maintenance and recurring costs are also less.

Thus, the Japanese quail farming can be undertaken with less capital investment and little skill, and the returns will be realized earlier.

4.2.2 Sexing

At about 3 weeks of age, the adult male is identified by cinnamon-coloured feathers, blunt and smaller feathers on the upper throat and lower breast region. The females in the same region will have black stippled feathers on lighter cinnamon colour and the feathers are pointed in shape (Fig. 4.2). The male makes a loud voice which usually sounds as "ko-turro-neex". You will be surprised to know that the males weigh less (160 g) than the females (200 g) at 8 weeks.

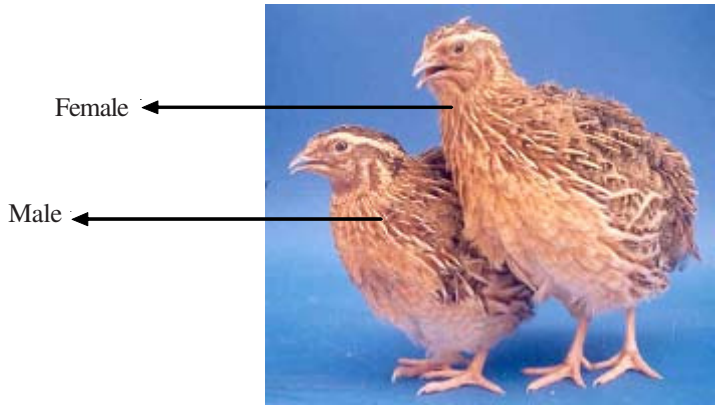

Fig. 4.2: Japanese Quail Male and Female

4.2.3 Breeding, Incubation and Hatching

For breeding, male and female quails are required at the farm. Grouping a single male with two or three females will generally give high fertility when the quails are kept in colony pens. One male to three females is sufficient and reduces fighting among males. Eggs should be collected several time a day and stored at a temperature of 10-13° C. Best results are obtained when eggs are held no longer than one week before setting. The eggs should be fumigated after they are collected or alternatively they can be fumigated within 12 hours after being placed in the incubator. Do not fumigate embryos that are between 2 and 5 days old.

Fig. 4.3: Hatching of baby quails

The incubation period for quail is 17-18 days, depending on the strain and the incubation procedures. Eggs should be placed large end up in the setting tray. Forced-draft incubators should maintain an incubating temperature of 37.5°C ± 0.3°C (99.5° ± 0.5°F) and a relative humidity of 60% wet bulb reading of 30°C ± 0.5°C (86° ± 1.0°F) until the 14th day of incubation. Eggs should be turned every 4 hours to prevent embryos from sticking to the shell. On the 14th day, candling should be done to remove cracked eggs, infertile and dead embryos. Transfer the eggs to hatching trays and stop turning. A separate hatcher should be operated at 37.2°C (99°F) and a relative humidity of 70% with a wet bulb reading of 32.2°C (90°F).

4.2.4 Housing

The Japanese quails can be reared on the floor or in specifically designed cages. Battery brooders are used to rear up to 3 weeks of age; later on shifted to growing cages in which many growing birds are grown in each cage called as colony or community cages. At 8 weeks of age, they are shifted to laying cages. The cage design is similar to chicken, but smaller in size. The battery brooder (Fig. 4.4) consists of tiers each measuring 160 cm × 80 cm with a height of 25 cm which can accommodate 60 to 75 quail chicks. The colony growing cages will not have brooding area, but have tiers of the same dimensions as that of brooder cage. Each such tier can accommodate 80 to 100 growers. Three-bird laying cages (Fig. 4.5) measures 25 cm wide and 15 cm in depth and height. Egg rolling space is 2.5 to 3.0 cm. The colony laying cages are similar in dimensions to colony growing cages but they will have slope in the floor with an egg rolling space of 2.5 to 3.0 cm. Each of these tiers can accommodate 80 to 100 hens.

Fig. 4.4: Quail Chicks in battery brooder

Fig. 4.5: Cage system of rearing

Space requirements of Japanese quail are tabulated below:

Table 4.1: Space Requirements of Japanese Quail

Age (weeks)	Floor Space (cm^2/bird)	Feeder Space (cm/bird)	Drinker Space (cm/bird)
Up to 2	75	2.0	1.0
3 to 5	100	3.5	2.0
6 to 8	125	5.0	2.5
9 and above	150	7.0	4.0

4.2.5 Feeding

Quail rations are available wherever they are being reared on commercial purposes. Their nutrient requirements are as follows:

Table 4.2: Nutrient requirements of Japanese quail

Parameters	Starter/Grower (0-6 weeks)	Breeder/Layer (6 weeks onwards)
Metabolizable energy, Kcal/kg	2900	2900
Protein, %	24.0	20.0
Lysine, %	1.30	1.00
Methionine, %	0.50	0.45
Calcium, %	0.80	2.50
Available phosphorus, %	0.30	0.35
Vitamin A, IU/kg	1650	3300
Vitamin D, ICU/kg	750	900
Vitamin E, mg/kg	12	25
Riboflavin, mg/kg	4	4
		Source: NRC, 1994

During egg production, the feed consumed is 25 to 28 g/bird/day and during maximum production period, feed conversion ratio can be 3.3.

Check Your Progress 1

Note: a) Use the space given below for your answers.

b) Check your answers with those given at the end of the unit.

1) What are the advantages of rearing Japanese Quail?

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2) How will you differentiate between Japanese Quail and chicken?

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3) How will you differentiate between a male and female Quail?

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4) What are the basic requirements of quail eggs during incubation and hatching?

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4.2.6 Management

You should know that Japanese quail chicks at hatch will only weigh 6 g and therefore, extreme care is necessary while brooding. You will be surprised to know that even if a chick falls from a tier on to the ground, it may die.

(i) Brooding Chicks on Floor

Newly hatched chicks are small and require proper brooding management.

Fig. 4.6: Brooding of quail chicks on floor

Japanese quail chicks are purchased as day-old chicks, reared up to the age of five weeks, and sold to the market for meat. Litter material like paddy husks or groundnut hulls is spread to about 2.5 cm depth, and empty gunny cloth or a corrugated sheet is spread over it. A brooder guard in the form of a cardboard sheet or metallic sheet about 20 cm height is arranged in a circle over the gunny sheet on the litter material. Adequate warmth must therefore be ensured by the provision of electric bulbs at the centre of the brooder guard arrangement, or by coal-stove heating or gas brooding. In a brooder guard circle of 3 feet diameter (90 cm), about 150 chicks can be accommodated. Drinkers and feeders should not be kept under the source of heat inside the brooder circle. A drinker space of about 0.3 cm, and a feeder space of 0.6 cm per bird, must be provided during 0-2 weeks. Up to two weeks, two chick drinkers of 10 cm diameter and 1.5 cm high on the sides, each of 500 ml capacity, and two feeder plates of 22 cm diameter and 2 cm high will be sufficient for 150 chicks in each brooder circle.

(ii) Rearing Growers

From three weeks up to 5th week of age onwards these birds are known as growers. During this period, the birds are much stronger and are able to withstand stress. During this period, if the outside temperature is comfortable, then, the brooding bulbs may be removed. The drinker and feeder space should be increased to 0.6 and 1.2 cm, respectively from 3-5 weeks of age. From the third week, a linear feeder, 45 cm long, 2.5 cm height and 10 cm wide, and a drinker of 15 cm diameter and 2.5 cm high at the brim and 1200 ml capacity will be sufficient for 75 quail chicks. The feeders have to be designed in such a way that these birds will not be able to place their feet inside and waste feed. The protein levels in the feed are lowered during this period to 20-22% from 26%. It is essential to manage these birds well to obtain a good body weight.

(iii) Cage Rearing

Two differently designed types of cages are required to rear Japanese quail chicks up to market age. A brooder cage is required to rear them from day-old to 17-18 days of age and a grower cage from 18-19 days to market age. The cages are

designed as multi-tier cages with about a 10 cm gap between each tier, and a droppings tray fitted into the gap. Each tier can be further divided into smaller compartments. A brooder cage can be constructed as four or five tiers of 180 ×120 × 25 cm, and each tier can be divided into four compartments of 90 × 60 cm size each. About 100 chicks can be reared in each compartment, and 400 chicks in each tier. Provision must be made for heating bulbs in the centre of each compartment (Fig. 4.7). The grower cage can be 240 × 120 × 25 cm size, with each tier divided into four compartments of 120 × 60 cm size each. About 60 grower quails can be reared in each compartment up to market size. Feeders and drinkers are fixed outside the cage units. Feeding is done three times a day and watering twice daily without limiting the intake. Japanese quail chicks should not be left without feed or water at any time of the day. This will affect their growth rate and increase the mortality rate.

Fig. 4.7: Rearing of Quails in Cages

(iv) Rearing of Layer Quails

The layer quail can either be raised in cages or on floor. If the birds are raised in cages (Fig. 4.8), then you could have tiered cages or Californian type cages. Each bird must be provided with 180 cm^2 space. The waterers may be fitted outside the cages or nipple waterers (automatic waterer) may be fitted in the cages. In a layer cage, the floor of the cage must have a slight gradient to enable the egg laid to role out of the cage and to be held by a folded sleeve that extends out of the cage by about 2.5 inches. Japanese quail requires 14-18 hours of light per day to maintain maximum egg production.

Fig. 4.8: Layer Quails in Cage

(v) Egg production

Japanese quails mature by 8 weeks of age and peak egg production is attained by 13-15 weeks of age. They produce eggs which are about 8% of their body weight;

whereas, in chicken, it is about 3.5 % of body weight. Most of the eggs are laid between 3 pm to 8 pm. The eggs weigh around 10 g and are highly mottled (dark colours of different shades and shapes on the shell). The Japanese quail egg has a mosaic pattern egg shell as seen in the Fig. 4.9 and the egg shell is very thin, therefore care has to be taken while collecting and storing these eggs. However, there is a white egg producing line developed. As the bird gets older, the egg size also increases. The eggs have to be collected at least thrice a day.

Fig. 4.9: Quail Eggs

(vi) Beaktrimming

Procedure is similar to chicken; done at 3 weeks of age. More care is required because the birds are small and handling is more difficult than chicken. Beak trimming is particularly important because while mating males are likely to cause severe injury to females.

4.2.7 Health Care

Japanese quails are also hardy; but they are susceptible to diseases such as Ranikhet disease, Infectious Bursal disease, *E. coli* infections etc. They can be controlled on the same lines as explained for chicken. Sanitary management is the best guarantee against disease by providing clean potable water, prevention of overcrowding and placing birds in a well ventilated place. Japanese quails are comparatively more resistant to infectious diseases than chicken. Fowl cholera, coli-bacillosis, enteritis and mycotoxicosis are some diseases that affect Japanese quail. However, more deaths (even up to 20-25 per cent) occur during the brooding age (0-14 days) due to managerial errors, especially failure to provide adequate warmth, the entry of chill air, too many chicks in one brooder unit, improper drinkers, etc. If adequate care is taken, the mortality rate up to market age can be restricted to 8-10 per cent.

4.2.8 Egg and Meat Products

Quail eggs and meat have many good qualities which make them a cheap source of protein. Some of them are discussed below:

(i) Egg

Quail eggs are tasty, and they contain more yolk than chicken eggs. They can be served as boiled eggs (Fig. 4.10) for table purposes, and children are very fond of them. Quail eggs contain higher proportions of high-quality protein and fat. They can also be sold after pickling (Fig. 4.11).

Fig. 4.10: Boiled Quail Eggs

Fig. 4.11: Quail Egg Pickle

(ii) Meat

Japanese quail can be sold to the market at five weeks of age as live birds or as dressed or cleaned meat (Fig. 4.12). After bleeding, the practice of hot water dipping and defeathering is not followed, and the skin is removed along with feathers. It is not advisable to market Japanese quail weighing less than 150 g. Cleaned meat will be 70-74 per cent of the live body weight. You can arrange to sell these birds alive to retailers or hotels etc. You can also have your own outlet and dress these birds and sell them.

Fig. 4.12: Dressed Quail Meat

Quail meat contains more protein (22-24 per cent) and less fat (about 2 per cent) than most other kinds of meat like mutton, chicken, etc. Therefore, it is good for growing children and youth and also for health-conscious adults. Quails carry more meat in the breast region (41 per cent) and also contain a high amount of calcium. The meat can be cooked using many of the Indian spices and condiments to make curries and other Indian dishes. The meat taste good as a tandoori item. The quail legs can be fried and sold separately like the way the winglets of the chicken are sold. The giblets (heart, liver and gizzard) can be pickled and sold.

Check Your Progress 2

Note: a) Use the space given below for your answers.

b) Check your answers with those given at the end of the unit.

1) Explain cage rearing of grower quails.

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2) Describe the Japanese quail egg. How many times you must collect eggs in a day?

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3) When do the birds reach peak lay? How many hours of lighting do they require in a day?

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4) What are the various diseases in Japanese quail?

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4.3 LET US SUM UP

Japanese quails are emerging as birds of commercial importance and can be reared for egg and meat purpose. The Coturnix quail is claimed to be the World's greatest laying bird and its meat is a delicacy. The floor space requirement for the bird is much less and therefore the capital investment is low. The incubation period is 17 to 18 days. For breeding, male Japanese quail is required and the male: female ratio is 1:2. The birds for meat and egg can be raised either on floor or in cages. The meat birds are sold by 5th week of age. The birds can be sold live address. The eggs from Japanese quails can be eaten as boiled eggs etc. they can also be pickled and sold.

4.4 GLOSSARY

Albumen : White portion of the egg.

Artificial Incubation : Hatching of eggs the mechanical means by an incubator.

Breed : A group of birds answering truly to type, shape, size, carriage and characteristics, distinctive of the breed name they take.

Brooder Guard : A barrier provided using cardboard etc., to prevent chicks from strain.

Brooding : Relates to rearing of young ones from day old using artificial heating and light.

Cages : A system for housing birds it is made of steel and welded wire netting in horizontal, stepped or vertical configuration. There could be many tiers as required.

Californian Cages : Stepped configuration of battery cages.

Deep Litter : Birds are raised on floor using bedding material like paddy husk, wood shavings etc.

Floor Space : The amount of space per bird under the intensive system of raising birds.

Gourmet : A person with discriminating taste in food and wine or a person who takes his/her food considerably more seriously than most.

Inbreeding : Breeding together of closed related birds eg. parent to offspring or sibling mating.

Incubator : A machine to warm and hatch eggs.

Litter Material : Bedding material like rise husk, saw dust, shredded paper etc.

Pen : An enclosed area in which birds are confined.

Yolk : Yellow portion of the egg

4.5 SUGGESTED FURTHER READING

Jadhav, N.V. and Siddiqui, M.F. 2007. *Handbook of Poultry Production and Management,* 2nd Edition. New Delhi, India.

Narahari, D. and Rajini, R.A. 2005. *Poultry Projects and Economics*, Pixie Publishers, Karnal, India.

Panda, B. and Mohapatra, S.C. 1998. *Poultry Production*. ICAR, New Delhi, India

Poultry Production Teaching Manual. 2007. Department of Poultry Science, Madras Veterinary College, Chennai, India.

Sreenivasaiah, P.V. 2006. *Scientific Poultry Production,* 3rd Edition. International Book Distributing Company, Lucknow, India.

4.6 REFERENCES

Jadhav, N.V. and Siddiqui, M.F. 2007. *Handbook of Poultry Production and Management,* 2nd Edition. New Delhi, India.

Narahari, D. and Rajini, R.A. 2005. *Poultry Projects and Economics*, Pixie Pub. Karnal, India.

Poultry Production Teaching Manual. 2007. Department of Poultry Science, Madras Veterinary College, Chennai, India.

4.7 ANSWERS TO CHECK YOUR PROGRESS

Check Your Progress 1

1) The advantageous of rearing Japanese quails are:

- Does not require specially designed house as they can be comfortably reared even in vacant rooms meant for human habitation.
- The floor space requirement is much less, and the capital requirement therefore is much less.
- The quails are ready for the market as table birds at five weeks of age. The quail also starts laying from the sixth week.
- More resistant to diseases than chicken and do not normally require any vaccination, deworming, etc. such that their management is easier.
- Because of their smaller body size, the quails consume less feed and therefore maintenance and recurring costs are also less.

2) Quails are also distinctly different from chicken because:

- They are very small compared to chicks; adults weigh about 10% of adult chicken.
- They do not have combs and wattles.

- They can fly.
- Mature by 8 weeks of age itself.

3) At about 3 weeks of age, the adult male is identified by cinnamon-coloured feathers, blunt and smaller feathers on the upper throat and lower breast region. The females in the same region will have black stippled feathers on lighter cinnamon colour and the feathers are pointed in shape. The male makes a loud voice which usually sounds as "ko-turro-neex". You will be surprised to know that the males weigh less (160 g) than the females (200 g) at 8 weeks.

4) The incubation period for quail is 17-18 days, depending on the strain and the incubation procedures. Eggs should be placed large end up in the setting tray. Forced-draft incubators should maintain an incubating temperature of 37.5°C ± 0.3°C (99.5° ± 0.5°F) and a relative humidity of 60% wet bulb reading of 30°C ± 0.5°C (86° ± 1.0°F) until the 14th day of incubation. Eggs should be turned every 4 hours to prevent embryos from sticking to the shell. On the 14th day, candling should be done to remove cracked eggs, infertile and dead embryos. Transfer the eggs to hatching trays and stop turning. A separate hatcher should be operated at 37.2°C (99°F) and a relative humidity of 70% with a wet bulb reading of 32.2°C (90°F).

Check Your Progress 2

1) The grower cage can be 240 × 120 x 25 cm size, with each tier divided into four compartments of 120 × 60 cm size each. About 60 grower quails can be reared in each compartment up to market size. Feeders and drinkers are fixed outside the cage units. Feeding is done three times a day and watering twice daily without limiting the intake.

2) The Japanese quail egg has a mosaic pattern egg shell is very thin. The egg weighs about 12 g each. The eggs have to be collected at least thrice a day.

3) Peak egg lay is reached by 12-13 weeks of age. Japanese quails required 14-18 hours of light per day to maintain maximum egg production.

4) Fowl cholera, coli-bacillosis, enteritis and mycotoxicosis are some diseases that affect Japanese quail.