

COMMERCIAL JAPANESE QUAIL PRODUCTION AND DISEASE MANAGEMENT

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Abstract: Japanese quail farming is getting popular in India and occupies next to chicken population, at present. The general management practices and feeding management are almost similar to that of chicken, except minor variations in the nutrient content of diets. Though they are hardy in nature when compared to chicken, they are also susceptible to both infectious and non-infectious diseases affecting chicken due to intensive system of rearing in larger numbers. Common diseases encountered in Japanese quail production are brooder pneumonia, omphalitis, coccidiosis, ulcerative enteritis, mycoplasmosis, pasteurellosis and Newcastle disease. Adopting strict bio-security procedures helps in preventing the entry and control of pathogens in and around the farm.

Keywords: Japanese quail, common diseases and management.

Introduction

Japanese quail (*Coturnix coturnix japonica*) farming is one of the emerging poultry farming systems in India. The merits of raising J. quail are short generation period (age at sexual maturity is around 6 weeks), high rate of egg production, ease of handling, disease resistant and requirement of less floor space. Moreover, quail meat and eggs are table delicacy.

Several types of quails are available in the world. The quail species found in wildlife is still a protected Indian bird. However, Japanese quail of farm bred variety is exempted from Wild life protection act, vide notification of Ministry of environment and forests, dated 06.12.13. It is not an indigenous bird and is domesticated by several research programs over a long period; it can very well be used for rearing in farms and marketed.

Japanese quail was first introduced in India from California during 1974 by Central Avian Research Institute, Izatnagar (U.P.). Commercially, Japanese quail can be reared for both meat and egg production. Adult commercial broiler quail weighs around 220 gm at 4 weeks of age with the feed conversion ratio of 2.3. Females are heavier than males and weigh 20 – 30 gm more than males. The ready-to-cook yield (including giblets) ranges from 74 to

76 per cent depending on the age of quail, which is relatively higher than that of broiler chicken. The commercial layer quail lay more than 270 eggs during its laying period of 10 months.

Japanese quail hybrids

Since the heritability for growth rate is medium to high, higher body weights in Japanese quail is generally obtained by mere selection. However, due to short-generation interval, the inbreeding depression will set in the selected birds after few years and thus leads to poor fertility, hatchability and livability. Hence, employing line crossing and utilizing the principles of heterosis are the alternatives for evolving high-yielding meat-type J. quail strains. The same principles can be employed for evolving egg-type J. quail strains as well.

General management of Japanese quail chicks

The hatch weight of meat-type quail chick is only 9.5 gm that needs more attention during first few days of age. Early chick mortalities are mainly due to drowning in chick drinkers. Drowning can be practically avoided by keeping pebbles inside the drinker during first 7 days. Now a days, separate Japanese quail chick drinkers are available that will avoid drowning of chicks in the drinking water. Moreover, suitable nipple drinking system can be used for the day-old J. quail chicks itself, which will provide hygienic water continuously.

Another reason for early chick mortality is due to huddling and stampeding during unexpected power failure. It can be avoided by brooding lesser number of chicks in one brood, preferably lesser than 150 quail chicks in one brooder.

Since quail chicks are fragile in nature, spreading of corrugated paper or gunny cloth over the wire mesh or litter, in case of floor brooding for the first one week will avoid sprawling of legs. Japanese quail chicks can be reared either in battery or floor system. But battery type brooding appears to be better than floor type brooding. Heating sources like electric bulbs or heaters or gas brooders can be employed to provide heat during brooding period. The behaviour of the chicks is the indication of the optimum temperature requirement as they are evenly scattered. In general, the starting temperature should be around 37⁰ C and gradually reduced at the rate of 3⁰ C every four days.

Grower / finisher management

Chicks used for meat purpose can be grown on 24 hours light up to market age for more feed consumption and body weight gain. The floor space, feeder space and drinker space requirement of Japanese quail under cage system of rearing during brooding and growing periods are,

Space requirements	Brooding period (0 – 2 weeks)	Growing period (3 – 5 weeks)
Floor space	100 cm ² /bird	250 cm ² / bird
Feeder space	3.2 cm	6.6 cm
Drinker space	1.6 cm	3.3 cm

The body weight gain, feed consumption and feed conversion efficiency of meat type Japanese quail is as follows:

Week	Body weight (g)	Cumulative Feed consumption (g)	Feed conversion ratio
1 – Week	40	53	1.7
2 – Week	95	163	1.9
3 – Week	157	311	2.1
4 – Week	219	482	2.3

Feeding of Japanese quail

Feeding nutritionally balanced diet is vital for profitable quail farming. They can be fed with different types of diets during their life span. The major nutrient requirements of Japanese quail are as follows:

Nutrients	0-2 weeks	3-4 weeks
ME/kg (Kcal)	2900	3000
Protein (%)	24	20
Calcium (%)	1.20	1.20
Available Phosphorus (%)	0.45	0.45
Lysine (%)	1.40	1.20
Methionine (%)	0.60	0.50
Methionine + Cystine (%)	0.80	0.75

The ingredients used for feed formulation are similar to that for Chicken. However, usage of animal feed ingredients like fish meal and meat meal can be avoided, since they are prone for clostridia contamination. Unlike chicken, quail waste more quantity of feed that can be prevented by designing suitable feeder with grill.

Diseases affecting Japanese quail

Japanese quail have been reported to be more resistant to common poultry diseases [1]. The mortalities encountered in Japanese quail are mainly due to management issues, especially in young chicks. Major reasons for mortalities during the brooding period (0-10 days of age) are inadequate brooder temperature, entry of chill air due to broken side curtains, too many chicks under one brood, improper drinkers etc. If adequate attention is given, the mortality rate can be restricted to 2 per cent from day-old to market age. Due to intensive system of rearing in large numbers, the Japanese quails are also being affected with infectious and non-infectious diseases as that of chicken. Major diseases affecting Japanese quail and the preventive measures are as follows:

1) Brooder pneumonia

Japanese quail chicks are more sensitive to aspergillosis (brooder pneumonia), a fungal disease. It is caused by inhalation of spores of *Aspergillus fumigatus*. When the moist litter material, especially improperly dried coir pith are used for brooding chicks or when the hatcher trays are contaminated with aspergillus spores, the incidence of occurrence of brooder pneumonia is more. The affected chicks feel difficulties in breathing; gasping may be noticed. Chicks may show paralytic symptoms. On post-mortem examination, white colour nodules of pin head to larger size may be noticed in the lungs and air sacs.

Using dry litter material and receiving chicks from hygienically maintained hatcheries, the occurrence of brooder pneumonia in Japanese quail chicks is lesser. Providing 0.05% CuSO₄ solution in drinking water of affected flock curtails the seriousness of the disease.

2) Omphalitis

Improper healing of naval, incomplete yolk sac absorption and inflammation of naval along with bacterial infection, especially *Eischerichia coli* results in Omphalitis. It is otherwise called as “Mushy chick disease”. Since yolk is the focus of infection, many embryos die before hatching, especially during later period of incubation. If hatched, the chicks show enlarged abdomen. The navels become inflamed and moist.

The mortalities can be prevented or reduced by administering proper antibiotics (eg. Cephalaxin) in the drinking water during first 5 days of age. Improvement in hatchery hygiene will help to control colibacillosis and reduce production losses [2].

3) Coccidiosis

Coccidiosis is a protozoan disease affecting the intestines. Confinement of quail in floor pens promotes the spread of coccidial infections (*Eimeria uzura*, *E. bateri* and *E. tsunodai*).

Bloody droppings, ruffled feathers, hunched posture and mortalities are the symptoms of coccidiosis in Japanese quail. The life cycle of quail coccidian is approximately seven days. Young quail are more susceptible than adults; recovered birds have resistance to the particular strain they recovered from but can be infected with other strains. The cage reared quails are less prone for coccidiosis.

Appropriate usage of anticoccidial drugs in the feed of floor reared birds reduces the incidence of occurrence. During outbreaks water medication with amprolium or other anticoccidial drugs will control the disease.

4) Ulcerative enteritis (Quail disease)

This is an acute bacterial infection characterized by the sudden onset of rapidly increasing mortality. Ulcerative enteritis is caused by *Clostridium colinum*, which affects quail of all ages, though young birds are more susceptible. Dying birds may exhibit no premonitory signs. They usually well muscled and have filled crops; healthy quail often exhibit the watery white droppings, sometimes associated with the disease.

Prophylactic administration of 100 g bacitracin / tonne of feed provide protection against infection. It is important to note that quail become 100 percent susceptible to infection after discontinuing medication. Cage reared birds are less affected since the infectious organism is in the droppings and remains viable almost indefinitely in litter.

5) Mycoplasmosis

It is caused by *Mycoplasma gallisepticum*, which commonly affects Japanese quail from 4 weeks of age onwards. Unlike other respiratory diseases, it spreads relatively slowly to other birds, and thus called as Chronic Respiratory Disease (CRD). Affected birds show the symptoms of sneezing, coughing and gargling sounds during respiration. Eyes may show frothy exudates and conjunctivitis. The most important pathological lesion is cloudy appearance of one or more air sacs. The severity of the mycoplasmosis is depending on the ammonia level in the farm [3].

Addition of 0.05 to 0.1 per cent tylosin in drinking water for 3 to 5 days or tiamutin 45 per cent soluble granules at a concentration of 0.025 per cent for 3 consecutive days in drinking water controls the disease. The drugs like monensin, naracin or salinomycin are incompatible with tiamutin. Treatment may also be given for *E. Coli*, the common complicating organisms in case of CRD.

6) Pasteurellosis

Fowl cholera caused by *Pasteurella multocida* usually appears as a septicaemic disease often associated with high morbidity and mortality and affects all types of birds. Among domestic birds, turkeys tend to be more susceptible. However, it affects Japanese quail also. Generally, fowl cholera occurs between 10 to 13 weeks in chicken. However, in quails the outbreak of pasteurellosis is reported as early as 8 days of age by [4]. Obvious clinical signs of acute fowl cholera may not occur until very late in the infection and include depression, ruffled feathers, mucous discharge from the mouth, diarrhoea and respiratory distress.

Avian pasteurellosis can be treated with suitable antimicrobial agents. However, multiple antimicrobial resistant is noticed due to the presence of small plasmids in the bacteria [5]. Hence, selection of antimicrobial agent based on antimicrobial sensitivity test is advocated. Usage of fowl cholera vaccines is also advisable to control pasteurellosis in Japanese quail farms.

7) Newcastle disease

Avian paramyxovirus causes Newcastle disease that commonly affects chicken, ducks and turkeys. Japanese quails are somewhat resistant to NDV infection; nevertheless they may be infected under stressful circumstances. Mohamed and Abdel Hafez [6] studied about the occurrence of Newcastle disease in Japanese quail when reared nearer to chicken farm and reported that susceptibility of quails to NDV infection was lesser than that of chickens. Further they added that quails play an important role in the epidemiology of ND and its transmission to chickens causing heavy economic losses. It gives an insight to develop new vaccine strategies for use in quails to protect birds from both disease and infection and to reduce virus shedding and spreading to other birds.

Conclusion

Japanese quails reared under intensive system are subjected to production stress as that of chicken due to fast growth rate and / or higher egg production. When these birds are subjected to stress, their immune mechanism is also affected, leading to the occurrence of various chicken diseases. Though usage of suitable antimicrobial agents or vaccines can control various infectious diseases, the controlling mechanism adds additional expenditure on production cost, apart from production losses. Adopting strict bio-security procedures will aid in preventing the entry and control the pathogens in and around the farm.

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