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Japanese Quail (Coturnix)  
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THE JAPANESE QUAIL, also known as Coturnix quail, pharaoh's quail, stubble quail and eastern quail, differs considerably from the North American bobwhite quail. The bobwhite is larger than the Japanese quail; however, the Coturnix produces larger eggs. The incubation time needed for fertile eggs is shorter (14-17 days) compared to bobwhite quail eggs (23 days). Coturnix may start laying eggs as early as the 6th week of age compared to 16 weeks for the bobwhite.

The Japanese quail is popular as a scientific research animal. In the Poultry Science Department at Michigan State University, Japanese quail has been used as a forerunner in research studies to evaluate the feasibility of such research with other

avian (bird) species. Michigan State University has also introduced this bird to the science classroom in Michigan schools under the Youth Activity Program called "Coturnix in the Classroom." Coturnix can be used from kindergarten through grade 12 in schools to study many areas of biology, and is also an excellent tool in working with handicapped and disadvantaged students.

Another important youth program involving Japanese quail in Michigan is the 4-H Japanese Quail Project. Japanese quail becomes an ideal poultry animal for the urban and younger youth in 4-H because the quail are very small, easy to handle and can be raised in little space.

## HISTORY

Japanese quail have been widely distributed in Europe and Asia. Egyptians used to trap large quantities

from their farm lands for meat. In Japan, these birds were kept as pets beginning in the eleventh century. By 1910, however, Japanese quail became popular in Japan for egg and meat production. They were introduced in the United States by bird fanciers around 1870.

It has been reported that wild Coturnix lay eggs in small clutches of 5-12 eggs and incubate them naturally. In this country, at present, Coturnix are used mainly for research and have been domesticated for many generations. A few commercial farms raise Coturnix for eggs and meat. Certain mutants of Japanese quail have been developed for their color of plumage, color of egg shell and body size.

## DESCRIPTION

Japanese quail can be sexually separated by their feather color difference when they reach about 3 weeks of age (Figure 1).

### Adult Males

Adult males may weigh in the range of 100-140 grams (4-5 oz.). They reach sexual maturity at the age of 5-6 weeks. The plumage color on the throat and breast will be cinnamon or rusty brown. When males are sexually matured, a large glandular or bulbous structure appears above the cloacal opening. If this gland is pressed, it will secrete a foamy secretion. Males are generally longer-lived than females. Males crow, and their sound has been described as "Ko-turn-neex."

### Adult Females

Adult females are generally larger than the males and weigh in the range of 120-160 grams (4.5-6 oz.). By selection, heavier birds can be produced for meat. The females can be easily identified by their plumage color under the throat and upper breast. The color is slightly whiter than the male and is characteristically black-stippled. In this area the feathers are longer and more pointed than feathers of male birds. Female birds are of short life span compared to the male. They may start laying eggs as early as

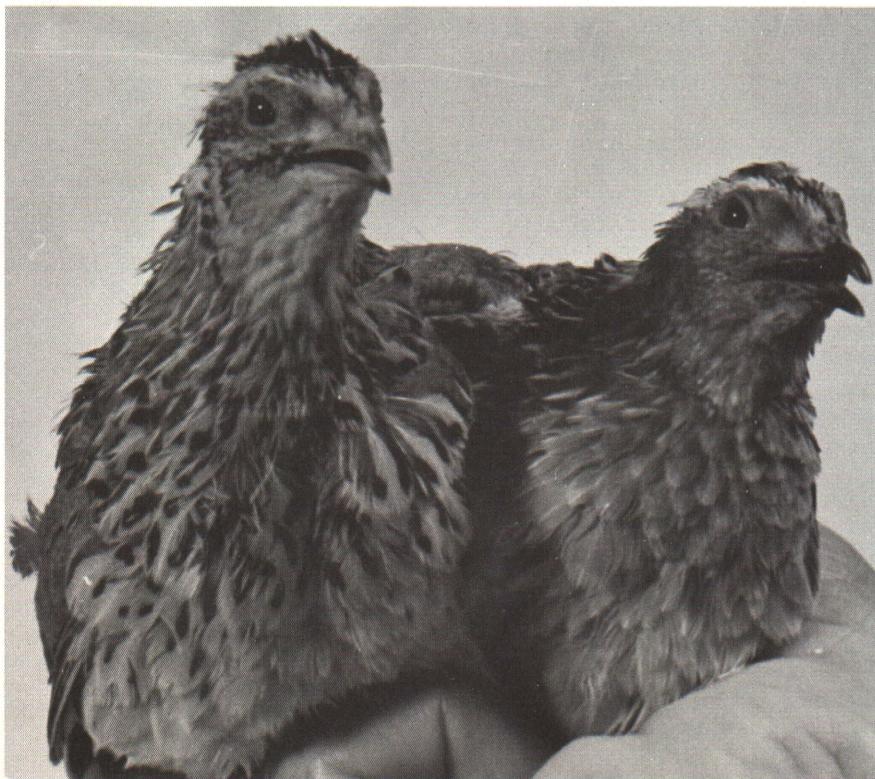


Fig. 1 — Left female adult quail, right male adult quail.

35 days of age under proper conditions. They may lay 200-300 eggs a year.

Fertility in breeder flocks is high between 2-8 months of age, although after that it is considerably less. A ratio of one male to one or two females should be mated for better fertility.

### EGGS

A Coturnix egg weighs approximately 10 grams (.4 ounce), an estimated 8 percent of the female body weight. The basic shell color is white or buff with patches of brown, black or blue (Figure 2). Individual hens characteristically lay eggs with a particular color pattern, shape and size. Certain recessive strains of Japanese quail lay almost-white-shelled eggs.

In Michigan State University laboratories, it has been determined that the composition of egg is 47.4 percent albumen, 31.9 percent yolk and 20.7 percent shell and membranes. Quail eggs are edible and can be prepared in the same manner as chicken eggs.

#### Care of Fertile Eggs Prior to Incubation

1. Collect eggs two to three times a day if birds are raised in colony cages or on the floor. This will prevent cracking of the shell by the birds.
2. Handle eggs very carefully—the Coturnix egg shell is thinner than chicken egg shells.
3. Eggs stored prior to incubation should be kept in a cool place at approximately 55°F (13°C) and at about 70 percent humidity.
4. Do not hold eggs more than seven days prior to incubation, as hatchability will be reduced considerably after that.
5. If eggs have to be stored for a considerable time, cover them with a polyethylene plastic bag which helps to prevent drying of the egg content.

#### Incubation

Domesticated quail do not have the tendency of broodiness, and hence, eggs must be incubated under a



Fig. 2—Japanese quail eggs.

broody hen or by artificial incubation. If you plan to set eggs under a hen, do not place eggs of other species with them. The size difference of the eggs can produce different egg temperatures from the body of the hen and result in poor hatchability. Japanese quail eggs can be successfully incubated by using almost any type of commercial incubator. The egg trays of large commercial type incubators will have to be modified to hold the quail eggs.

Temperature, humidity, turning and ventilation are the four major factors important in incubation. Failure of any of these will result in poor hatch. Always follow the manufacturer's recommendation very closely. In Michigan State University laboratories, the following schedule is used to hatch quail eggs successfully.

The eggs should be turned a minimum of three times each day. A turning schedule might be 8:00 a.m., 2:00 p.m. and 10:00 p.m. A good idea is to mark an X on the side of an egg (with a felt tip pen). This mark will be up on day one, down on day two, etc., the eggs being rotated through a 180

degree turn. Do not turn quail eggs after the 14th day of incubation. Japanese quail eggs will generally hatch on the 17th day of incubation, but hatch can take place as early as the 14th day and as late as the 19th day. Differences in quail incubation period are not yet scientifically understood. After every hatch, the incubator should be thoroughly cleaned, disinfected and fumigated.

#### Reasons for Poor Hatch

1. Eggs are infertile.
2. Eggs are cracked and contents dried out.
3. Eggs are too old when set.
4. Eggs are held in extreme temperatures prior to incubation.
5. Shells are contaminated.
6. Eggs are not turned often enough.
7. Temperature is too high, too low or too variable.
8. Too little humidity or too much humidity in the incubator.
9. Improper ventilation.

Once the quail chick pips the egg, it may take up to 10 hours before it gets out of the shell. It will take a few hours before the wet chick is completely dry.

After the first chick is hatched, at least 24 hours of incubation should be allowed for the others to hatch. Chicks can stay in the incubator safely for a day and then should be carefully transferred to a warm brooder unit at approximately 95°F.

#### Operating Temperature for Single-stage Forced-draft Incubation

Days of Incubation	Temperature (Dry-Bulb)		Humidity (Wet-Bulb)	
	(°F)	(°C)	(°F)	(°C)
1 to 14	99.5	37.5	87	30.6
14 to hatching	99.0	37.2	90	32.3

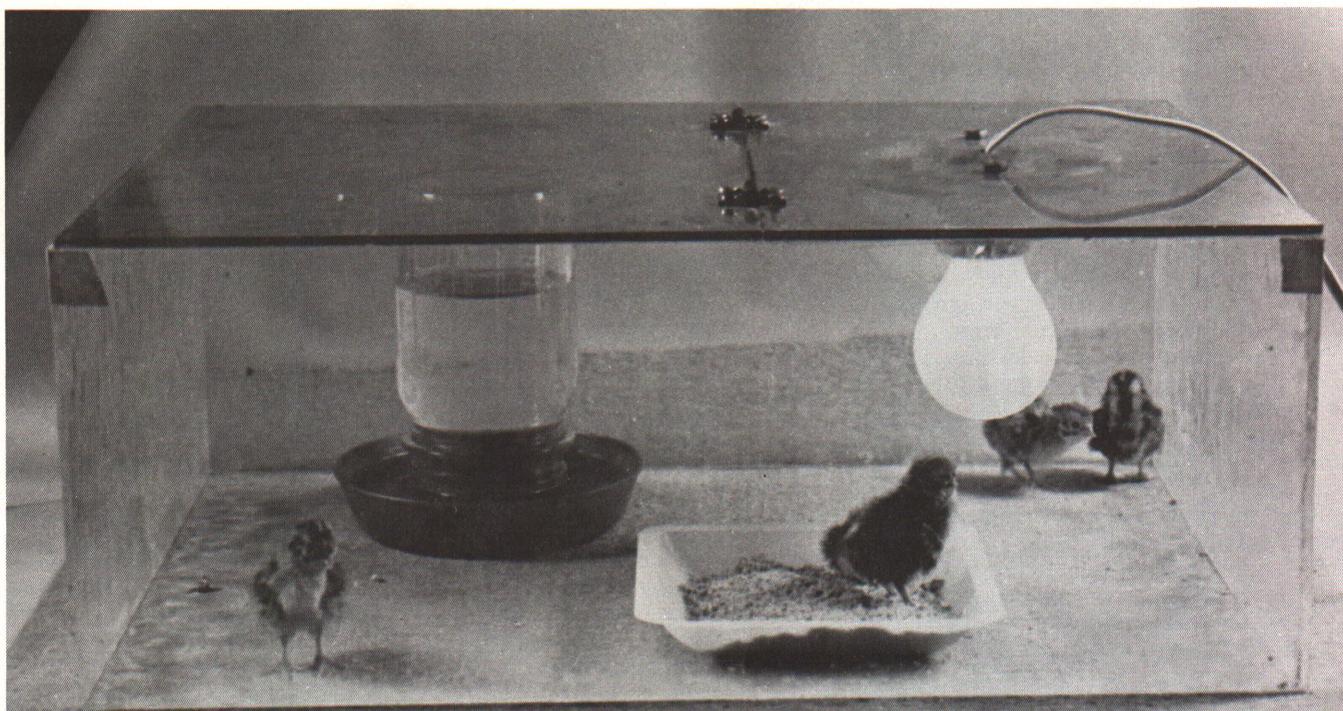


Fig. 3—Baby quail in plexiglas brooder.

### BROODING AND CARE OF YOUNG

A few important things to remember are:

1. Never allow the baby quail to become chilled.

2. The brooder should be operated early enough to maintain temperature about 95°F. (In the MSU laboratory, small plexiglas brooders are used for small numbers of quail. See Figure 3.)

3. A temperature of 95°F should be maintained continuously in the brooder at the head level of chicks for the first week. After that, the temperature can be decreased 5°F every week until the fourth week.

4. A regular light bulb (60 watt), infrared bulb, or any other heating unit can be used as a heat source. However, for small-scale operations, a light bulb will provide both heat as well as light. If you do not have a thermometer, watch the behavior of the chicks for a while to determine whether they are too cold, too hot or doing well. If too cold, chicks will huddle together under the heat source. If too hot, they walk away from the source of heat. If the heat is comfortable, they will be evenly dispersed under the heat source.

5. Quail raised for early maturity and better egg production should be given a 24-hour period of daylight for the first 4 weeks, using an incandescent light bulb.

6. Placing a paper sheet in the brooder may help in easy cleaning. However, never use a smooth paper since the chicks will develop spraddle legs and later die. Use regular newspaper, paper toweling or such material.

7. Proper ventilation is a must for the young quail.

8. A balanced ration high in protein should be available to the quail chick at all times. A turkey starter of 28 percent protein will provide excellent growth. Game bird starter or chick starter may be substituted if a 28 percent protein turkey starter feed is not available in your area. To prevent feed spillage, float a wire-mesh on top of the feed for the first few days.

9. Always keep plenty of fresh water in a waterer inside the brooder. Take precautions to avert drowning, since that is one of the main reasons for early mortality. Placing a wire-mesh cut in a donut shape in the waterer will prevent chicks from falling into the waterers. The cup of the waterer could also be filled with marbles or pebbles to prevent drowning.

10. Clean the litter, waterer and check the feeder. Discard the litter daily to avoid odor problems.

11. Transfer the chicks at the end of the fourth week to the floor or cages.

12. Debeak the chick to prevent pecking and cannibalism. Use a nail

clipper to remove the tip of the beak of the quail chick when about 2 weeks of age.

### CARE OF ADULT QUAIL

Young birds can be transferred from brooder to cages or to floor around the fourth week, depending upon the interest of the raiser. If the birds are raised for dog training or as a hobby, they can be raised on the floor. If you raise them for breeding or for egg or meat production, they will perform better in cages. Pedigree cages of 5" × 8" × 10" will hold a pair of quail. Colony cages of 2' × 2' × 10" will accommodate up to 25 adult quail while 2' × 4' × 10" will accommodate up to 50 adult quail. It is recommended, however, that more space be provided to eliminate odor problems if raised indoors. For cage construction, ½" × 1" welded wire is recommended.

Adult quail will perform better if given 16-25 square inches of floor space per bird. They need ½ to 1 inch of feeder space per bird for feed and ¼ inch of trough space for water. Adult female hens require 14-18 hours of light per day to maintain maximum egg production and fertility. Egg fertility lowers considerably after the birds are of one year of age.

Litter materials such as chopped straw, chopped corn cobs, sawdust or wood shavings should be used at

about a 2 inch thickness if the birds are raised on the floor. Daily cleaning of the cages and removal of the droppings is necessary for sanitation if birds are kept in indoor cages.

### **Nutrition**

The exact dietary requirements of the Japanese quail are still controversial. A quail ration is not available commercially in Michigan at the present time. Turkey starter, chicken starter or a game bird starter, which can be purchased at local elevators, should be adequate for the quail for proper egg and meat production. A free choice supply of calcium (limestone or oyster shell) should be available to laying hens.

Adult quail will eat 14-18 grams (.5 ounces) of a balanced ration. Fill the feeder only half full to prevent feed spillage. Fresh water should always be available. Water is one of the most essential nutrients for the bird.

### **Disease Prevention**

Although Coturnix is a hardy bird compared to other poultry species,

it can be affected with most of the common poultry diseases. Sanitary management is the best guarantee to prevent diseases. Use commercial disinfectants to thoroughly clean and disinfect the cages, feeders and waterers. Take measures to control rats, mice and flies which may bring disease organisms to the quail.

### **USES OF QUAIL**

Japanese quail comes under the category of game birds, and in different parts of the United States, the breast and leg muscles are considered to be a delicacy. Fried quail, European quail delight, roasted quail and marinated quail are common forms of preparation.

The eggs are similar in taste to chicken eggs and can be used for banquets and other such occasions. Plain hard-cooked eggs or colored eggs can be used for decorating salads. They are good appetizers and snacks. Quail eggs can be pickled, using standard canning procedures, by adding hot,

white vinegar (diluted), salt and pepper and bacon, sausage, or hot pepper, etc., for flavoring. Pickle the eggs at least 24 hours before serving. Roasted quail eggs in a spicy sauce are great if you are interested in a little spicy food.

Write to the Extension Office, Department of Poultry Science, Michigan State University, East Lansing, MI 48824, for quail recipes.

### **SUPPLY OF STOCK**

There are a few places in Michigan where Japanese quail have been raised by 4-H members and leaders. Please check with your county 4-H youth agent of the Cooperative Extension Service for details.

Fertile eggs may be available at a small cost from the Department of Poultry Science, Michigan State University, East Lansing, Michigan. Eggs must be picked up because they cannot be mailed. Since these eggs are in great demand, please ask for your fertile eggs well in advance of your needs.