Semi-intensive system:	House should have easy access to outside run as the ducks prefer to be outdoors during the day time even during winter or monsoons. Generally, the proportion of night shelter to outside run is 1:3. In a semi-intensive house in the pen a space allocation 8 birds/m^2 is provided. **Run:** The run should gently slope away from the houses to provide drainage. In the run the fences should be about 60 cm high; each duck is provided an area of 2 to 2.5 m^2. For best results, raise ducklings in lots of not more than 500. **Water channel:** Normally a continuous water channel of size 50cm. (20") wide and 15-20cms. (6-8") deep may be constructed at the far end, on both sides, parallel to the night shelter, in the rearing or layer house.

Backyard system of housing

- 10-15 ducks are reared in the homestead.
- Only the household wastes are fed, it is a low input system.
- The bamboo basket is used as a night shelter.
- After collecting eggs in the morning the ducks are let out to for foraging by them.
- This system is mostly practiced in Kerala where backwaters pass through homesteads.
- Under this system the major feed for duck is frogs, snails, & fishes present in the backwaters.
- Protection from predator should be done.
- A unit of 25-30 ducks fetch Rs 8,000-12,000/- par year.

Water requirement

Though duck is a water fowl and very fond of water, water for swimming is not essential at any stage of duck rearing. However, water in drinkers should be sufficiently deep to allow the immersion of their heads and eyes. If they cannot do this, their eyes tend to get scaly and crusty and in extreme cases, blindness may follow. They may be allowed to water after 1 month of age.

Handling of Ducks:

Ducks can be carried:

- By the top of the neck;
- By grasping both wings in one hand;
- By holding them under one's arm with the duck's head facing the rear; or
- By holding one wing and the leg from the same side.

Precautions while catching

They must be caught and handled so that stress is minimised. Approach the duck from behind and catch it around the neck, as the neck is quite strong. Then pull the bird around so it faces you. **Ducks should not be caught by the legs, as this may cause harm to the lags and make them lame**.

Feeding Methods:

Wet mash only:	Ducks prefer wet mash due to difficulties in swallowing dry mash as it is easier to scoop the feed.
Natural feed:	Ducks are good foragers. The use of range, pond or supplementary green feed, reduces the feed cost.
Pellet feeding	of ducks although expensive under the intensive system of rearing, has its benefits such as saving in the feed consumed, minimum wastage, saving in labour, convenience and improvement in sanitary conditions.
Precautions	Ducks should never have access to feed without water. During the earlier period i.e. during brooding the ducklings must always have access to feed, but later on they may be fed twice a day i.e. first in the morning and then late afternoon.
Feeding regimen/ Feed formulations:	Khaki Campbell duck consumes about 12.5 kgs. of feed up to 20 weeks of age. Afterwards the consumption varies from120gms/day and above per bird per day and depending upon the rate of production and availability of greens. Different sourses of carbohydrate like maize/wheat/ broken rice upto 50-55%, for protein fish waste/ soyabean/ others 20-30%, deoiled rice bran upto 10-15%leaf meals 5% and vitamin -mineral premix making upto 100% to meet the nutrient requirements of duck. Locally available feed ingredients in different combinations should be used to meet their nutrient requirements.

Nutrient requirement of Ducks by ICAR,2013

Nutrients	Units	Starter	Grower/ Rearer	Layer
Age	Weeks	0-8	8-16	>17
Crude protein	%	20.5	16.5	16.5
ME	kcal/kg	2800	2650	2650
Calcium	%	1	1	3
Available phosphorous	%	0.42	0.35	0.35
Niacin	mg/kg	60	55	50
Choline	mg/kg	1000	750	750

Health Cover

A. **General Principles for Prevention of Diseases.**

1. Procure day old ducklings from disease free flock.
2. Maintain proper hygienic conditions in all sheds
3. Provide adequate feed, water and floor space etc.
4. Rodents and wild birds etc should be prevented to enter the houses.
5. Follow regular vaccination schedule. By vaccinating those with Duck Cholera vaccine at 3 to 4 weeks of age (1ml s/c). Duck plague vaccine at 8 to 12 weeks of age (1 ml s/c).
6. Proper disposal of dead birds.
7. Footbaths should be provided at the entrance of each shed.
8. Reduce stress effect while handling and transport or any causes of stress
9. Ensure clean and adequate water supply.
10. Use of suitable litter material and periodical turning is essential to keep it dry.

B. **Vaccination schedule**

Name of the vaccine	Route	Dose	Age of ducks
Duck cholera (pasteurellosis) Adults	Subcutaneous	1 ml 2 ml	3-4 weeks 1 month after last vaccination
Duck plague	Subcutaneous	1 ml	8-12 weeks. Adults

Toxins (Special caution for ducks)

Ducks are highly susceptible to mycotoxins more than chickens or turkeys. Aspergillus flavus and Aspergillus parasiticus produces aflatoxin and grows on cereal grains and oilseeds pre and post production phase. Particularly ducklings are highly susceptible to these toxins. Wet harvest conditions encourage the growth of this mould. The minimum toxic dose for ducks is 0.03 ppm or 0.03 mg per kg in feed to cause heavy mortality. Selection of feed ingredients for moisture or any predisposing conditions for mould growth should be checked before receiving from buyer. Hence fresh feeds to be given to ducks and storage feed bins must be checked regularly.

Reference: Simply Poultry Science by Prof R. Asha Rajini

Prepared by:
Dr. Nibedita Nayak, Scientist, Poultry Science
Dr. Amiya Ranjan Sahu, Scientist, Animal genetics and Breeding
Atasha Delia D'Mello, YP-I, PSP
Dr. Parveen Kumar, Director, ICAR-CCARI, Goa

Published By:
Dr. Parveen Kumar
Director, ICAR-CCARI, Old Goa, Goa-403402
Telephone-0832-2993097, Email: director.ccari@icar.gov.in
Website: https://ccari.icar.gov.in

Technical assistance by:
Shri Vishwajeet Prajapati
Technical officer (Computer)
ICAR - Krishi Vigyan Kendra, North Goa

Duck Production and Management for Coastal Farmers

Under STC funded

ICAR- Central Coastal Agricultural Research Institute
(INDIAN COUNCIL OF AGRICULTURAL RESEARCH)

Introduction

Ducks are one of the important types of poultry of family Anatidae. They are identified by characteristic features such as broad bill, webbed feet and closely related to other water fowls like geese and swans. Widespread in various types of aquatic habitats, ducks mostly breed in freshwater bodies such as shallow lakes, marshes and swamps. They are believed to be domesticated in Southeast Asia some 4000 years ago. Since then, they have been used for their meat, eggs and feathers. Duck meat is consumed in various parts of the world because of its high nutritional value with complete essential amino acid and good fatty acid composition and a high percentage of polyunsaturated fatty acids. Tracing far back to 600 years ago in history, Peking duck meat formed part of the main dish of the Chinese Emperor. Today, duck meat is still very popular especially among many Asian countries such as China, Hong Kong, Japan, Korea and Taiwan. Due to lower water content, eggs are more nutritious than chicken eggs. But, Duck farming in India has not undergone any process of industrialization or commercialization as that of chicken. India has some inherent natural advantages for duck farming especially in coastal parts. A 7561-kilometer-long coastline and extensive water shed areas in several parts of the country offer excellent natural habitat of ducks.

Why to go for duck farming:

1. Ducks lay more egg per bird per year and lay larger size egg than chicken egg by about 15 to 20 g.
2. Ducks require lesser attention and thrive well in scavenging conditions.
3. Ducks feed on grain which is lost during post-harvest practises and act as provider of natural fertilizer in rice fields with their manure which contributes to higher yields.
4. Ducks have a longer profitable life. They lay well even in second year.
5. Ducks do not require any elaborate houses like chicken.
6. Ducks are more resistant to common avian diseases.
7. Marshy river side, wet land and barren moors upon which chicken or no other type of stock will flourish, are excellent quarters for duck farming.
8. Ducks lay 95 – 98% of their eggs within two hours after sunrise, and then can be left for grazing to save feed cost and labour.
9. Ducks are suitable for integrated farming systems such as duck-cum-fish farming, duck farming with rice cultivation. (200-300 ducks per hectare of waste area). Under integrated duck farming with rice cultivation, the ducks perform four essential functions viz., as they search for food, their bills loosen up the soil around the rice plants-helping in weeding, insect control and manuring.
10. Ducks are natural predators against insects, slugs and snails flukes (2 to 6 ducks per 0.405 hectare of land).
11. Ducks can be used to free the bodies of water from mosquito pupae and larvae (6 to 10 ducks per 0.405 hectare of water surface).
12. Ducks are quite intelligent, can be tamed easily, and trained to go to ponds and come back in the evening of their own.
13. Ducks are also used for decorations purposes, for clothing and as a game animal.
14. Duck meat and eggs are an important source of protein and iron. Duck eggs contain all essential amino acids required in the human diet and are a good source of vitamins and minerals

Duck farming in India: Status and Scope

In India, ducks are reared traditionally by small farmers for their livelihood. Ducks form about 10% of the total poultry population after chicken and contribute about 6-7% of total eggs produced in the country. Though various duck breeds like Khaki Campbell, Indian Runner, White Pekin and Muscovy are available at different research stations, indigenous ducks varieties like Kuttanad ducks, Moti and Kuzhi are still preferred by the farmers. Also known as desi ducks, indigenous ducks constitute more than 90% of the total duck population and are the second largest species contributing towards egg production in India. As per 20th livestock census (2019), the desi duck and improved variety of ducks contribute 0.89% and 0.26% of eggs respectively to the total egg production. Breeding and selection has led to the improvement of duck breeds. Pekin ducks, Muscovy, Khaki Campbell, Indian Runner and mule ducks are among the duck breeds popularly raised for their meat and eggs.The population of ducks in India grew with an increase of 42.4% in 2019 as compared to 2012. India ranks 8th in the world in duck production whereas China ranks the 1st. Ducks are mostly concentrated in the Eastern and Southern states, mainly coastal region with non-descriptive indigenous stocks, which are poor layers.

Breeds Of Duck

Breed	Morphology	Body weight (Kg)		Egg production	Egg colour
		Drake	Duck		
Egg type					
Indian Runner	White, Perpendicular carriage	1.6-2.2	1.6-2.0	>250/year	White / Creamy white
Khaki Campbell	Brown/Khaki	2.2-2.4	02-2.2	>300/year	White
Meat Type					
White Pekin	White plumage, Yellow flesh	4.5	4.0	>150-180/ year	White/ Blue green
Muscovy	Black &white	4.5-6.4	2.2-3.1	>50/year in free-range	White/ Green Cream
Aylesbury	White skin	4.5	4.0		
Rouen		4.5	4.0		Blue/ White
Ornamental					
Crested White	White	3.5	3.0		
Bantam ducks	White / grey calls				

Indigenous breeds of duck

Breed	Morphology	Body weight (Kg)		Egg production	Egg colour
		Drake	Duck		
Egg type					
Chara	Blackish Brown, **lustrous greenish head in male**	1.65	1.5	150-160 eggs/year	White
Chempally	Brown, **dull greenish black in head**	1.6	1.5		White
Pati	Dark brown in drakes with greyish black head; tail with black and white feathers	1.9	1.8	75-90 eggs per annum Egg weight: 60.5 gm	White
Maithilli	Ducks have uniform light/dark brown feathers throughout the body in Mosaic pattern. Dark brown to ash colour in drakes.	1.24	1.1	54.6 egg/yr (range 33-71). Average egg weight is 49.53g.	White

From Egg to duckling: Incubation and Hatching

Eggs should be collected 2-3 times /day after laying in the morning hours. Egg should be cleaned lightly with cloth or egg sanitizer in case of soiling. Mating ratio of 1 male to 8 females in broiler strains and only 4-5 female in layer strains gives optimum fertility. Incubation period of duck is 28 days except for the Muscovy duck which varies 35-36 days. In forced draft incubators temperature of 37.5 to 37.2oC (99.5 to 99oF) and relative humidity 30 to 31oC (86 to 88oF) during incubation for the first 25 days and 32.7 to 33.8oC (90 to 92oF) for the last three days of hatching is desirable for optimum hatchbility. Eggs are `transferred to hatcher on 25th day. Eggs are sprinkled with lukewarm water having sanitizer once a day from 2nd day to 25th day and cooled for a maximum period of half an hour. Candling is done on 7th day to screening the infertile eggs. The eggs are turned hourly.

Ducklings to Adult ducks

Ducklings can be successfully brooded in any brooder house and under any type of brooder such as wire floor, litter or batteries used for chickens. Ducklings are generally easier to brood than chickens.

Require-ments	Brooding	Growing	Laying stock (Adult)
Age /Period	0 - 3 / 4 wks depending upon summer/winter 2-3 weeks for pekin ducks	From 5-15/16 weeks Usually ducklings are allowed to move to runs at the end of 3 to 4 weeks of age depending upon weather	above 17 weeks of age
Floor space	90 to 100 sq.cms/ ducklings under the brooder A wire floor space of ½ sq.ft per bird Solid floor space of 1 sq.ft per bird up to 3 weeks of age	Intensive system, 0.279 m^2 (3 sq.ft) up to 16 weeks of age. In Semi-intensive system, a floor space of 0.186 to 0.279m^2(2½ to 3 sq.ft) per bird Night shelter and a space of 0.929 to 1.394 m^2 or 10 to 15 f^2 as outside run per bird is provided up to 16 weeks week of age. Partitions up to the height of 60-90cm (2-3") inside the pens and the outside runs are adequate for control	Under intensive system, a floor space 0.371 to 0.465m (4 to 5 sq.ft) per duck is essential
Temp	29 to 32°C (85 to 90°F) from first to the fourth week		
Feeding space			For wet mash feeding in a linear feeder, allow 10 to 12.5 cm (4 to 5") feeding space per duck but for dry mash or pellet feeding adlib in feeders, a feeding space of 5 to 7.5 cm (2 to 3") per duck would be sufficient
Watering space	Water in the drinkers should be 5 to 7.5 cm (2 to 3") deep just sufficient to drink and not dip themselves	Water in the drinkers should be 12.5 to 15 cm (5"to 6") deep to allow minimum immersion of their heads	

Laying ducks: High egg laying strains of ducks come into production at 16 to 18 weeks of age. About 95 to 98% of eggs are laid by 9.00AM. One nest box of size 30x30x45cms. (12x12x18") must be provided for every three ducks. In case of laying breeds, a mating ratio of 1 drake to 8 ducks and in meat breeds I drake to 6 ducks is the allowed ratio.

Lighting: During the early period of life all-night lighting is required. Photo period of 14 to 16 hours per day is essential for optimum production during laying.

Litter material: Paddy husk, saw dust, wood shavings, sugarcane bagasse or any locally available material and sand are used as litter. All wet and damp litter must be removed from the shed. As ducks are very susceptible to heat stress, shade must be provided outside.

HOUSING

Ducks do not require elaborate houses. The house should be well ventilated, dry and rat proof. Types of housing system are Intensive, Semi-intensive (house and running pen for grazing) or backyard type.

Intensive system:	Ducks can be raised in commercial scale under confined conditions of wire floor/deep litter / corrugated boards/welfare cages. The number of ducklings should not exceed more than 500. Rearing of ducks in artificial polythene ponds can be done in water scares areas. **FLOOR:** The wire floors are not popular with breeders. Floor should be preferably concrete with 5-8cm filled with litter. Litter should be raked periodically and should be dry **ROOF:** The roof may be of shed type, gable or half round. It may have solid cemented or wire floors.