Duck diseases diagnosis, prevention and control

Acknowledgement

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Executive Chief of the Egyptian Health Council: Prof. Mohamed Mustafa Lotief.

Head of the Committee: Prof. Ahmed M Byomi

The rapporteur of the Committee: Prof. Mohamed Mohamedy Ghanem.

Scientific Group Members: Prof. Nabil Yassien, Prof. Ashraf Aldesoky Shamaa, Prof. Amany Abbass, Prof. Dalia Mansour, Dr.Essam Sobhy Dr.Mohamed Elsharkawy, Prof. Gamal A. Sosa., Dr. Naglaa Radwan, Dr. Hend El Sheikh

Authors: Prof. Dalia Mansour Hamed, Dr. Essam Elmarakby

Scope: The guidelines concerned diagnosis, treatment, and prevention of duck diseases. The guidelines also provided landmarks for the evaluation of the severity and the most suitable antibiotics for therapeutic intervention.

The target audience: The guideline is intended for all veterinarians who are intended to diagnose, treat, and control **duck Diseases**.

Aim: Duck production is essential to their economies and food security. When proper husbandry and management practices are used, ducks are relatively resistant to disease. A summary of some of the more prevalent diseases affecting ducks is provided below.

Types of Ducks

In Egypt, various types of ducks are reared for meat and eggs. Here are some types of ducks commonly raised in the country:

Muscovy Duck

Description: A large domesticated duck known for its rich meat flavor.

Characteristics: They have a unique appearance with a distinctive caruncle (fleshy growth) on the face. Muscovy ducks are also known for their ability to adapt to various environments and good foraging habits.

Use: Primarily raised for meat production and sometimes for eggs.

White Pekin Duck

Description: A popular breed that originated in China and is now widely raised in many countries, including Egypt.

Characteristics: Known for its white feathers, orange bill, and relatively fast growth rate.

Use: Primarily raised for meat due to its large size and rapid weight gain.

Campbell Duck

-Description: A prolific egg-laying breed developed in England.

Characteristics: They are medium-sized ducks with a khaki-colored plumage and are good foragers, making them well-suited for free-range systems.

Use: Primarily raised for egg production, known for their high egg yield.

Mallard Duck

-Description: A heavy breed.

- Characteristics: They are known for their rich flavor and tender meat, with a distinctive green head in males.

-Use: Primarily raised for meat.

Local Egyptian Breeds (Baladi)

- In addition to the above breeds, local varieties may also be found, which are adapted to the specific climatic and environmental conditions of Egypt. These may be reared for subsistence farming or local markets.

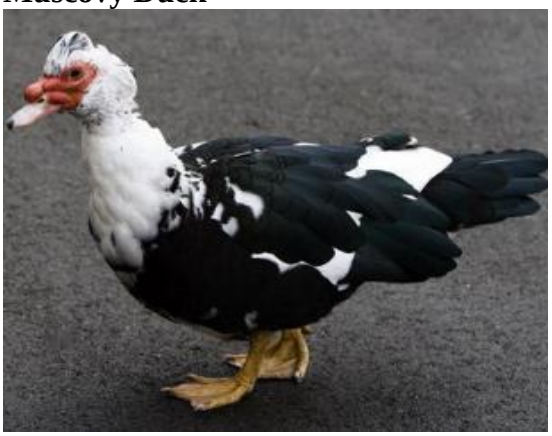
Sudan duck

is a breed that originates from Sudan and is also found in other parts of North Africa, including Egypt. Here are some key details about this type of duck:

Characteristics: Sudani ducks typically have a medium to large size and are characterized by their robust bodies. They usually have a distinct plumage that can come in various colors, with many having a combination of black, white, and sometimes gray or brown feathers.

Conclusion

The diverse types of ducks reared in Egypt serve various purposes, including meat and egg production as well as ornamental uses. Duck farming plays a significant role in the agricultural landscape of Egypt, contributing to food security and the livelihoods of many farmers.

Muscovy Duck 	**White Pekin Duck** 
Campbell Duck 	**Mallard Duck** 

Most common diseases of ducks according to Signs and Symptoms

Disease	Cause	Ages affected	Species	Mortality	Signs and Symptoms	Control
1. Velogenic viscerotropic Newcastle Disease (VVND)	Virus	Any	Most domestic birds	Mortality may reach 100% but often lower in ducks	Sudden mortality, often with few or minimal signs **Nervous:** Balance & walking problems, twisted necks **Respirators:** gasping, difficulty breathing, swelling of the head **Digestive:** diarrhea **Reproductive:** decreased egg numbers	Vaccination, biosecurity
2. Highly Pathogenic Avian Influenza (HPAI)	Virus	Any	Most domestic birds	Mortality may reach 100% but often lower in ducks and pigeons	Sudden mortality, often with few or no signs **Respiratory:** gasping, swelling of wattles & combs **Nervous:** tremors of the head and neck **Digestive:** diarrhea, thirst **Reproductive:** soft-shelled or shell-less eggs, decreased egg numbers	Biosecurity, depopulation, (vaccination)
3. Duck viral enteritis (duck plague)	Virus	Any, although adults more severely affected	Wild and domestic ducks and geese	5- 100% with the highest mortality in older birds	Sudden mortality, often with few or no signs **Digestive:** watery diarrhea, decreased appetite, thirst **Reproductive:** decreased egg numbers **Nervous:** difficulty walking, tremors **Respiratory:** pasted eyelids, nasal discharge	Biosecurity, (vaccination)
4.Duck virus hepatitis	Virus	Young, < 6 weeks	Ducks	Close to 100% in ducklings 1< wk old. 50% in 1-3 wk old, very low in > 4 wk old	Death may be the first sign of disease. **Nervous:** birds fall on their sides, kicking	Isolation of young ducks, (vaccination)
	Bacteria					Medication, remove

5. Fowl cholera		Birds >4 weeks are most susceptible	Chickens, ducks, geese, most birds	10-90% mortality. Mortality is highest in turkeys, ducks.	Sudden death is the first sign of disease. Respiratory: Gaping, difficulty breathing Digestive: diarrhea, especially in ducks	reservoirs, vaccination
6. Coccidiosis	Protozoa	Young birds, older birds become immune	Most although the coccidian of one species do not infest other birds	Variable depending on how severe the case is and the type of coccidian	Depression, weakness, decreased weight gain, dehydration. Digestive: may have mucold or bloody diarrhea.	Self immunization, medication
7. Aflatoxicosis	Toxin from fungus	Young birds more severely affected	signs more severe in duckling	Variable	**Nervous:** difficulty walking, convulsions, feather picking **Reproductive:** Reduced fertility and hatch rates. Decreased egg numbers	Remove contaminated food
8. botulism	Toxin from fungus that grows in rotting material	Young birds more severely affected	signs more severe in duckling	It depends on how many birds consume the toxin	**Nervous:** paralysis, especially of the neck. Birds will be flaccid.	Remove source of toxin , pick up carcasses, control flies, fix leaking water
9. vitamin deficiency	Lack of complete nutrition	Young birds more affected	signs more severe in duckling	moderates to high in young, confined birds	Vitamin E: Death before 4 days of age, Decreased hatchability **Nervous**: Difficulty walking and standing, 15-30 days of age. **Vitamin A**: Slow growth, drowsiness, ad mortality. **Respiratory**: Discharge from nose and eyes. Reproductive decreased egg numbers and hatching, increased blood spots in eggs.	Supplement vitamins in the water or feed..

Viral diseases affecting ducks

Duck virus hepatitis

Def: is a highly fatal contagious disease of young ducklings, 1-28 days of age. Ducklings are most susceptible at the younger ages and gradually become more resistant as they grow older. The disease is rarely seen in ducklings over 4 weeks of age. The onset of the disease is very rapid, it spreads quickly through the flock and may cause up to 90% mortality. Sick ducklings develop spasmodic contractions of their legs and die within an hour in a typical "arched-backward" position. The liver is enlarged and shows hemorrhagic spots. To prevent this disease, keep age groups isolated and vaccinate breeder ducks with an attenuated live virus duck hepatitis vaccine (to produce maternally immune ducklings).

Immunization of breeder ducks with:

- **Modified live virus vaccines**, using DHAV, DAstV-1, and DAstV-2, provides parenteral immunity that effectively prevents high losses in young ducklings.

The DHAV-1 vaccine is administered SC in the neck to breeder ducks at 16, 20, and 24 weeks and every 12 weeks thereafter throughout the laying period.

Three immunizations are advisable for passive protection of ducklings.

- **An inactivated DHAV-1 vaccine** for use in breeder ducks that have been previously primed with live DHAV-1 has been described. A single dose of the inactivated vaccine, administered IM before the birds come into lay, provides passive immunity for a complete laying cycle to progeny ducklings.

The chick-embryo origin, modified live DHAV-1 vaccine also can be used for early vaccination of ducklings susceptible to DHAV-1 (progeny of nonimmune breeders). This vaccine is administered SC or by foot web stab in a single dose to day-old ducklings. Vaccinated ducklings **rapidly develop an active immunity within 3–4 days.**

Antibody against DHAV-1, prepared from:

1- **The eggs** of hyperimmunized ducks and administered SC in the neck at the time of initial loss, is an effective flock treatment.
2- serum collected from adult ducks(age related disease)

Economic importance Significant economic losses may result from fatal outbreaks in commercial flocks and a drop in egg production.

Duck virus enteritis (duck plague)

Duck Virus Enteritis (DVE), commonly known as duck plague, is a highly contagious and often fatal viral disease affecting ducks.
Etiology: herpesvirus-1.

This disease is most likely to affect mature ducks, but is also seen in young ducks. Affected birds show sluggishness, ruffled feathers, greenish-yellow diarrhea that is sometime blood-stained. Dead birds often have blood-stained feathers around the vent and blood dripping from the nostrils. Hemorrhages may be found in tissues throughout the body. Eruptive lesions of the mucous lining of the esophagus and intestine are characteristic signs of the disease. Necrotic plaques may be observed in the cloaca. Regular immunization of breeder ducks with an attenuated live duck virus enteritis vaccine provides adequate protection.

Duck virus enteritis is most common in young ducks and is spread through contact with infected birds or their feces.

Clinical signs:

-Ducks infected with DVE may exhibit symptoms like loss of appetite, lethargy, diarrhea, and neurological signs.

Prevention and control:

- Primarily strict biosecurity measures, including:
- controlling access to the flock,
- limiting contact with wild waterfowl,
- disinfecting regular equipment and living areas.

Vaccination

- Vaccination against DVE is available and recommended in high-risk areas or for valuable breeding stock.

A live vaccine is available to control DVE in birds over 2 weeks of age and ducks gain active immunity when vaccinated subcutaneously or intramuscularly.

Avian Influenza

commonly known as bird flu, poses a significant threat to duck populations worldwide. This highly contagious viral infection affects ducks' respiratory, digestive, and sometimes neurological systems.

Clinical signs:

- range from mild, such as reduced egg production, to severe, including respiratory distress and sudden death.

Avian influenza can be spread through contact with infected birds or their feces.

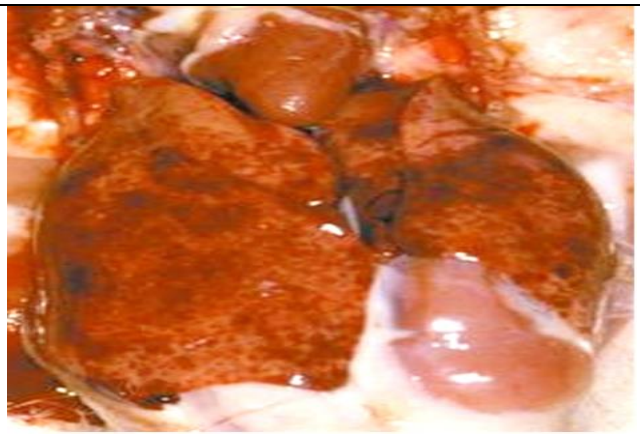
Prevention and control

- Biosecurity measures, including limiting contact between wild birds and domestic ducks, ensuring hygienic conditions in and around their habitat, and monitoring for any unusual signs or sudden deaths within the flock.

Prompt reporting of suspected cases to veterinary authorities is crucial to prevent the spread of the virus.

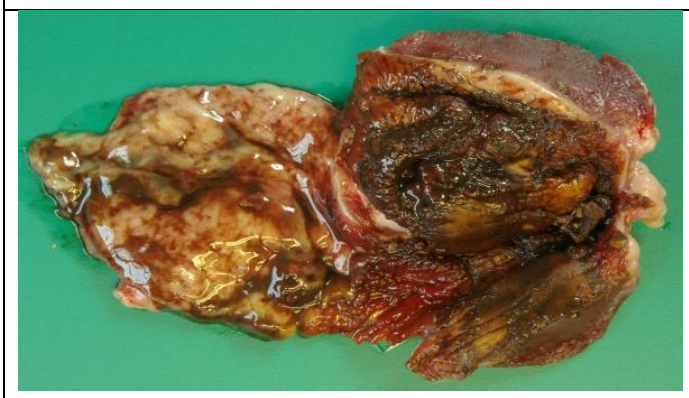
Vaccination in high-risk areas

Differential diagnosis in viral duck diseases



Duck hepatitis A virus type 1 infection in a commercial Pekin duckling. Note extensive petechial and ecchymotic hemorrhages throughout the liver.

The mucosa of the esophagus shows ecchymotic hemorrhages and ulcers in acute cases (left). In more chronic cases (right), the lumen becomes lined with a yellowish-white membrane(**Duck viral enteritis)**



Proventriculus and gizzard from a duck with duck viral enteritis show hemorrhagic contents. **(Duck viral enteritis)**

The liver color is pale yellowish to tan, with multiple pale foci that correspond to areas of necrosis. In late stages of the disease, a pale copper color and diffuse petechiation of the liver's surface are clinical signs of duck viral enteritis, and pale areas are indicative of focal necrosis.(**Duck viral enteritis)**

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<td> 
This thymus, taken from a duck with duck viral enteritis, shows mottling with multiple petechiae and necrotic focal areas.(Duck viral enteritis)</td>
<td> 
Duck hepatitis A virus type 1 (<u>after convulsions, most of the dead ducks are in a horned bowed position.)</u></td>
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<td> 
There are pericarditis, pericardial stasis, focal ulcers and necrosis(Avian Influnza)</td>
<td>Duck hepatitis A virus type 1
 
https://link.springer.com/chapter/10.1007/978-981-16-6100-6_14/figures/1</td>
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Bacterial diseases affecting ducks

Infectious serositis and New Duck disease: This bacterial disease of ducks is also known as *Pasteurella anatipestifer* infection,

Etiology: Pasteurella anatipestifer, (Moraxella anatipestifer), *Riemerella anatipestifer* (= *Pasteurella anatipestifer*, (at least 21) serotypes, not cross protection, Type A is most frequently associated with high mortality.

Clinical signs:

high mortality, weight loss and condemnation. In the acute form, listlessness, eye discharge and diarrhea are commonly seen. Ducks show incoordination, shaking of the head and twisted neck. Birds are commonly found on their backs, paddling their legs. Typical lesions found in dead birds are infected air sacs, membranes covering the heart and liver, and meningitis.

Post-mortem lesion:

-Perihepatitis without smell or liver damage.
-Pericarditis, airsacculitis, enlarged liver and spleen.
-Occasionally fibrinous meningitis.
-Salpingitis, Purulent synovitis.
-Chronic arthritis, sometimes with erosions of the joint cartilage, erosions of the cartilage of the hock joint in a duck with chronic Riemerella anatipestifer infection.
Skin (dermatitis, cellulitis due to recumbence
Differential diagnosis*:*
Duck viral enteritis, duck viral hepatitis, colibacillosis, coccidiosis, tuberculosis, Mycotoxin, botulism

Treatment:

are effective means of control.
-Penicillin, enrofloxacin and sulfadimethoxine (0.04-0.08% in feed) are effective in reducing mortality.
-Sulphonamides and potentiated sulphonamides are the products most commonly recommended Used in drinking water application.
- Subcutaneous injections of penicillin + dihydrostreptomycin, or streptomycin + dihydrostreptomycin are also highly effective
Vaccination against *Riemerella anatipestifer:*

Live, avirulent RA strain:
containing serotypes 1,2 and 5 may be given as an aerosol or in-drinking-water to day-old ducklings
and is protective for at least 42 days.

Inactivated Bacterins:
1- Oil – emulsion inactivated bacterin containing serotypes 1,2 and 5Duckling are vaccinated S/C twice at 2 and 3 weeks (Autogenously killed)is also protective, and is longer lasting than simple formalin-inactivated bacterin, but may cause a local tissue reaction.
2- Formalized bacterin
Containing RA 2,3 and 5 , given two inoculation I/M at 2 and 8 days or at 14 and 21 days of age
N.B. Protection only conferred against homologous strain

Avian Cholera

Avian cholera, also called fowl cholera, caused by the bacterium *Pasteurella multocida* is an important disease of domestic ducks, and is an especially troublesome disease of ducks.
This disease is associated with poor sanitation, and standing water in duck pens.
Clinical signs: include loss of appetite, mucous discharge from the mouth, diarrhea, and in breeder ducks, labored breathing.
Post mortem lesions: found in dead birds include hemorrhages on heart muscle, mesentery and abdominal fat. The liver is enlarged, copper colored and friable (easily crumbled). Pinpoint whitish spots may be seen on the liver. Good sanitation practices go a long way toward preventing this disease.
Treatment: Sulfadimethoxine (0.02-0.04%) and Chlortetracycline (0.044%) given in feed are effective treatments.

Colibacillosis

This common infection of poultry caused by *Escherichia coli*, causes reduced hatchability, infection of the yolk sac (omphalitis), a septicemia (bacterial invasion of bloodstream) in ducks 2-8 weeks of age and salpingitis and peritonitis in breeder ducks. In market ducks, *E. coli* infection produces lesions very similar to those seen in *Riemerella anatipestifer* infection. Good sanitation and management are important preventive measures.

Treatment: Sulfadimethoxine-ormetoprim (0.04-0.08%) and chlorotetracycline (0.044%) in feed are helpful in controlling this disease.

Botulism in Ducks

Etiology: Clostridium botulinum
Botulism, a severe and potentially fatal illness, can affect ducks due to ingesting toxins produced by the bacterium Clostridium botulinum.
This condition often arises from consuming contaminated water or feed, particularly in stagnant or decaying environments, dirty Water or food.
Clinical signs:
May include weakness, paralysis, difficulty breathing, and, in severe cases, death.
Prevention and control:

Monitoring of water sources, ensuring they are clean and free from decomposing organic matter. Proper waste management and promptly removing carcasses or decaying material near the ducks' habitat are crucial preventive measures.
If suspected, immediate veterinary attention is vital for supportive care and treatment to minimize the effects of the toxin.

Bumble foot in Ducks

Etiology: staphylococcus infection
Bumble foot, a common condition among ducks, is a bacterial infection of the feet characterized by swelling, redness, and the formation of a pus-filled abscess.
from injuries or irritation caused by rough or unsuitable surfaces in the ducks' environment.
Prevention and control
- Maintaining clean and dry living spaces, providing suitable flooring such as grassy areas or soft bedding, and regularly inspecting the ducks' feet for any signs of injury or swelling.
- Attention to minor injuries, along with proper wound care and disinfection, can prevent the development of bumble foot.
Treatment:
antibiotics and appropriate wound management

Infectious serositis

Infectious serositis(sever septicemia)

Fowl cholera

Bumblefoot/Staph Infection

Fungal and mycotoxin diseases affecting ducks

Aspergillosis in Ducks

Aspergillosis, a fungal infection caused by Aspergillus mold, poses a serious threat to the respiratory system of ducks. This condition often arises when ducks inhale spores in moldy bedding, feed, or damp environments.
Aspergillosis manifests through respiratory distress, wheezing, and lethargy, among other symptoms.
Prevention and control:
-Maintaining a clean and dry living space. dry and clean straw
-Regularly inspecting bedding for mold.
-Ensuring proper ventilation to minimize mold growth. If suspected.
Treatment:
including antifungal medications or supportive care to alleviate respiratory distress.

Mycotoxicosis Aflatoxin poisoning

Molds (fungi) that grow on cereal grains and oilseeds before and after harvest produce a number of toxins that are particularly harmful to ducks. By far the most toxic of these substance is a group of toxins called aflatoxins. Aflatoxins are produced by the molds *Aspergillus flavus* and *Aspergillus parasiticus*.

Ducks are highly susceptible to these toxins. Very small amounts will cause high mortality. Wet harvest conditions encourage the growth of this mold.

Common Duck disease problems:

Arthritis in Ducks

This condition causes inflammation and pain in the joints. Ducks, especially as they grow older, may develop arthritis, causing inflammation and stiffness in their joints. Factors like excessive weight, inadequate exercise, or previous injuries can exacerbate this condition.
Pekins are especially prone to this condition because they were bred as meat birds and are relatively heavy for their size.
To prevent arthritis, providing a suitable habitat with soft bedding and ensuring ample space for movement can aid in reducing joint stress. Additionally, maintaining a balanced diet rich in nutrients that support joint health, such as omega-3 fatty acids, can alleviate the risk of arthritis. If symptoms arise, consulting a veterinarian for proper diagnosis and potential treatments like pain management or physical therapy is essential to ensure the comfort and well-being of our ducks.

In very severe cases, you can get your duck a wheelchair to improve their mobility.

Leg Injuries in Ducks

Leg injuries can significantly impact a duck's mobility and well-being, often arising from accidents, falls, or environmental hazards.

These injuries may include fractures, sprains, or strains, which can lead to limping, swelling, or a reluctance to move.

Duck with bandaged leg

Preventing leg injuries involves maintaining a safe, obstacle-free environment for ducks, free from sharp edges or objects that could harm them.

If an injury occurs, providing immediate care by gently examining the affected leg for signs of damage, such as swelling or deformity, is crucial. Immobilizing the injured leg, providing a safe and comfortable space for rest, and consulting a veterinarian for proper diagnosis and treatment are essential steps.

Rehabilitation measures, such as physical therapy or supportive care, may aid in recovery and restore the duck's mobility.

Watch the video below to learn how to bandage a duck foot after injury

Soft-shelled eggs in Ducks

in ducks are two concerns that often affect their reproductive health, occurs when a duck cannot lay an egg for various reasons, such as a malformed egg, calcium deficiency, or an underlying health issue.

This condition can be identified by a **duck's distress**, reduced activity, and visible straining.

Soft-shelled duck egg, a common duck health issue

Soft-shelled eggs, on the other hand, result from inadequate calcium levels, causing the eggshell to be thin or malformed.

Prevention and control

- Balanced diet rich in calcium, supplement their diet with crushed oyster shells or specialized poultry calcium supplements, and ensure a stress-free environment.

Eye Infections in Ducks

Ducks with eye infections often exhibit signs like swelling, redness, discharge, or a cloudy appearance in one or both eyes. You might also notice them rubbing their eyes with their wings or seeming generally uncomfortable.

These infections can arise from various sources, including bacteria, fungi, viruses, or environmental irritants like dust and debris.

Prevention and control

- living environment clean and dry, and to provide fresh, uncontaminated water.
- Regularly check ducks for any signs of eye problems, and if you notice symptoms, separate the affected ducks to prevent spreading the infection.

Treatment:

antibiotic eye drops, to address the infection effectively. With prompt attention and proper care, they can ensure your ducks' eyes remain clear and healthy, contributing to their overall well-being.

Impacted Crop in Ducks

An impacted crop in ducks is a concerning condition where the food, usually grains, long strands of grass, or other feed, becomes lodged or impacted in the digestive tract. This often happens when ducks consume indigestible material or eat too quickly without adequate access to grit. Signs of an impacted crop include a visibly swollen area around the crop, decreased appetite, lethargy, and difficulty swallowing.

To prevent this, ensure your ducks have access to clean water and proper grit for digestion, and feed in a manner that discourages rapid consumption. If you suspect an impacted crop, consult a veterinarian experienced in avian care immediately for proper diagnosis and treatment.

In mild cases, you can put the duck on water only for 24 to 48 hours to allow the crop to empty itself before gradually re-introducing them to food.

Regular monitoring and thoughtful feeding practices can help prevent this uncomfortable condition in your beloved feathered friends.

Parasites in Ducks

Parasites in ducks can pose health risks and discomfort to our feathered friends. These organisms, ranging from external mites to internal worms, can affect ducks of all ages.

External parasites

- Mites and lice typically cause itching, irritation, and feather damage, leading to stress and potential infections. Regular health checks and providing clean bedding are crucial in preventing these pests.

Internal parasites

worms can affect the digestive system, causing symptoms like diarrhea and weight loss. Proper hygiene, regular deworming, and vet consultations are vital in managing and preventing internal parasite infestations.

Ensuring a clean living environment and a balanced diet are key factors in maintaining health condition.

Prolapse in Ducks

Prolapse in male and female ducks is a distressing condition where internal organs, typically the reproductive or digestive tract, protrude from the vent.

In females, reproductive prolapse occurs when the oviduct or cloaca protrudes, often due to excessive egg-laying or egg-related complications.

In males, prolapse can involve the cloaca or phallus. This condition is often triggered by excessive mating, injury, or underlying health issues.

Symptoms include visible tissue protrusion, discomfort, and inactivity. Immediate veterinary attention is crucial to address prolapse, which can lead to serious infections or further complications.
Treatment may involve gentle cleaning and repositioning of the prolapsed organ and supportive care to alleviate discomfort and prevent infection.

Nutritional deficiency (Vitamin E or selenium)

Wry Neck in Ducks
Wry neck, a distressing condition observed in ducks, manifests as an abnormal twisting or tilting of the neck, impacting their mobility and coordination. This condition, often called torticollis or crook neck, can present as a duckling holding its head at an awkward angle or struggling to maintain balance. It is sometimes described as a sideways "S" bend neck.
Wry neck is often attributed to nutritional deficiencies, particularly insufficient levels of essential vitamins like Vitamin E or selenium. **Control by**: providing immediate dietary adjustments, such as offering vitamin supplements or a balanced diet rich in vital nutrients, and seeking prompt veterinary consultation can be pivotal in managing and potentially reversing wry neck in ducks.
Differential diagnosis
Wry neck and limberneck (neck paralysis) are occasionally mistaken for each other. Limberneck, primarily a symptom associated with botulism, avian flu, or poison ingestion, presents as neck paralysis in ducks.

Wet Feather in Ducks

This is a condition in which a duck's feathers become waterlogged and lose their ability to repel water and insulate the bird.
This condition arises due to various factors such as insufficient preening, dysfunction of the oil glands, or prolonged exposure to excessive moisture.
Ducks affected by wet feather lose their feathers' ability to repel water, compromising their insulation and exposing them to environmental challenges.
Prevention involves providing a dry and clean living space, ensuring proper nutrition for healthy feather growth, and minimizing exposure to prolonged dampness.
If ducks develop wet feather, supportive care through gentle drying (even with a hair dryer), fostering a dry environment, and encouraging natural preening can aid recovery.
Sometimes, you need to wait until the duck molts. Molting helps with wet feather by allowing the growth of new, healthy feathers. As the old, waterlogged feathers are shed, the new feathers that grow in their place tend to be healthier and better equipped to repel water.
Duck inside to rest.

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- **General Biosecurity Measures in duck yards**:

- -Implement biosecurity practices to limit disease exposure, including quarantining new ducks, restricting contact with wild birds, and disinfecting equipment.
- -Regular Health Checks: Conduct routine health checks, observe ducks for signs of illness or abnormal behavior, and seek veterinary attention promptly if needed.
- -Predator Protection: Secure their living area to protect ducks from predators, reducing stress and potential injuries.
- -Parasite Control: Implement measures to control parasites such as mites, lice, or worms through regular checks and appropriate treatments.
- -Monitoring Behavior: Pay attention to their behavior, ensuring they are active and alert and displaying regular feeding and socializing patterns.
- - isolating the affected duck and providing a quiet, stress-free environment can aid recovery.
- - Nutrition: Ensuring proper adequate nutrition.
- - Provide clean water and a balanced diet suited to their age and health needs.
- -Medication: Antibiotics or antifungal medications .
- -Wound Care: Cleaning and treating wounds with antiseptic solutions or ointments can prevent infections and promote healing.
- -Supportive Care: Providing warmth, gentle handling, and comfort can aid in the recovery of ducks suffering from various health issues.

Vaccination Program for Commercial Ducklings

Age	Vaccine	Route	Type
1 day	*Riemerella anatipestifer*	Aerosol	Live vaccine[a]
10–14 days		Drinking water	avirulent vaccine consisting of the three major serotypes (1, 2, and 5) of *R anatipestifer*.
3 wk		SC	Bacterin A formalin-inactivated cell suspension of the three major serotypes (1, 2, and 5) of *R anatipestifer* is recommended for preventive immunization on farms where the disease is endemic or epidemic.

.N.B: Ducklings should not be vaccinated within 21 days of slaughter

Vaccination Program for Duck Breeder

Age	Vaccine	Route	Type
1 day	*Riemerella anatipestifer*	Aerosol	Live vaccine[a]
10–14 days		Drinking water	A live, avirulent vaccine consisting of the three major serotypes (1, 2, and 5) of *R anatipestifer*.
3 wk		SC	Bacterin[b]
4 wk	Duck viral hepatitis	SC	Live vaccine[c] (Type 1)
4 wk	Duck viral enteritis	SC	Live vaccine[c]
10 and 20 wk[d]	*R anatipestifer*	SC	Bacterin, formalin-inactivated cell suspension of the three major serotypes (1, 2, and 5) of *R anatipestifer*
	Duck viral hepatitis	SC	Killed virus vaccine (Type 1)
N.B: White Pekin breeder ducks normally start egg production at 24 weeks old. Egg production can be accelerated or delayed, and breeder vaccination should be completed before the onset of egg production to optimize the passage of parental immunity to progeny.			

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