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Lecture title: Respiratory System

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Summary:

Functions of the Respiratory System of a Chicken

- ❑ Is one of the major systems of the body. It has a number of very important functions including:

1. Absorption of oxygen (O2) and disposal of carbon dioxide (CO2).
2. Vocal Communications.
3. Temperature regulation and heat release.

- ❑ As chickens are packed with feathers, they rely on their respiratory system for a stable body temperature. When it's hot, chickens don't sweat as they don't have sweat gland on their body so they breathe faster to get rid of heat.

Overview of the Chicken Respiratory System

- ✓ Chickens breathe through their mouth and Nasal opening.
- ✓ The air travels via the larynx and Windpipe to a pair of Lungs, where the chicken absorbs oxygen, just like humans.
- ✓ From there, it travels through Air sacs, which look like tiny balloons. These air sacs help to obtain more air and it helps in flight.

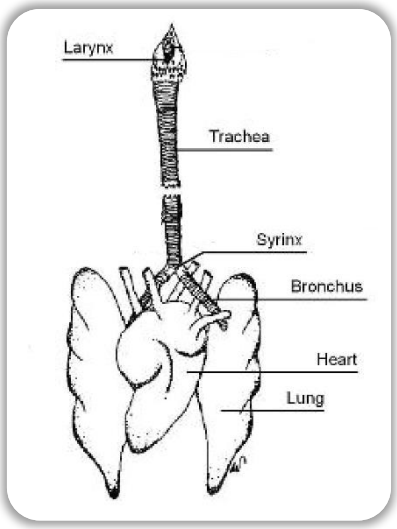
Chicken respiratory system parts

1. **Nasal opening**: Chickens have two nostrils that are located on their beak and develop their sense of smell while they are still in their egg.

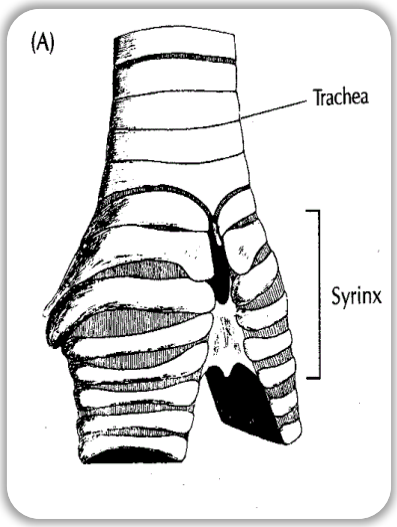
2. **Cranial larynx**: is located in this pharyngeal region, and it is the opening to the trachea. The larynx is responsible for allowing air passage, but it closes when feed is passing down the throat so that the feed goes down the esophagus and does not enter the trachea.

3. **Trachea or (Windpipe):**

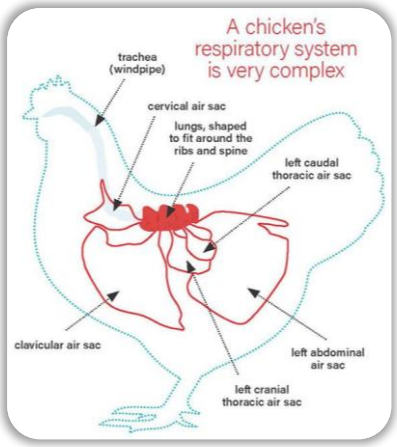
- ❑ The trachea is composed of tightly stacked cartilages which are rings shaped.
- ❑ The trachea can be palpated on the right side of the neck, it runs alongside the esophagus.
- ❑ The trachea is responsible for **conducting the air from nasal cavity to the bronchus**.



4. **Avian syrinx:**

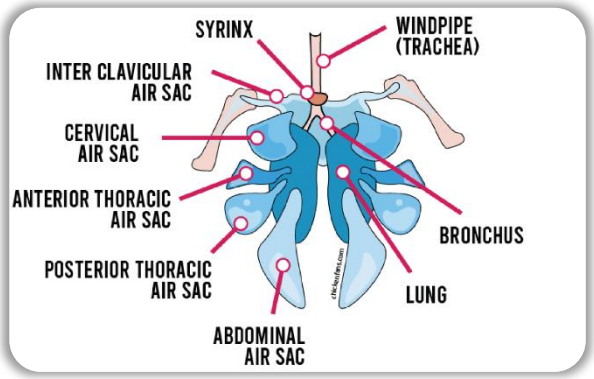


- ❑ Is the vocal organ of birds, located at the base of a bird's trachea.
- ❑ It is responsible for produces sounds by the vibrations of the syrinx's walls.
- ❑ The syrinx in the picture is **the voice box** of a chicken. Its function is to **create sound**, both for roosters and hens. When the muscles around the syrinx contract, the air passing through the membranes produces typical chicken sounds.



5. **Lungs:** Avian lungs are relatively **compact**, and do not have the capacity to expand due to the fact that they are **made of cartilage**. The lungs are located in the **dorsal region** of the body, on both sides of the spine.
6. **Air sacs:** Chicken have **9 air sacs** responsible for **containing more air** so the lung can absorb more oxygen.

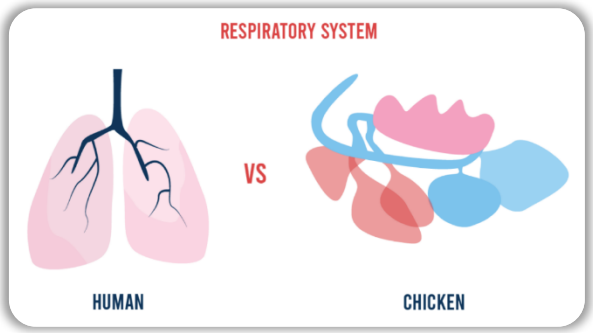
Their functions (Air sacs) are:



1. They help with **thermoregulation** of the body temperature.
2. They **lighten** the bird by increasing the volume without increasing the body weight.
3. They might **strengthen the voice** of the birds.

Respiration in Chickens

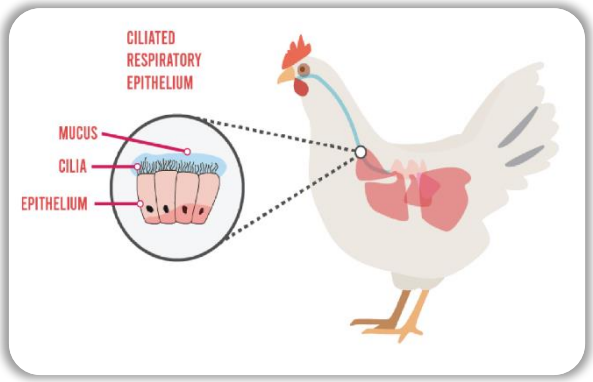
- Humans inhale and exhale, and it's as simple as that.
- Respiration in chickens is a little **more complex** with their air sacs. They need to **inhale and exhale twice** for the air to pass through the cycle completely.
- **Humans** have a **diaphragm** that separates our chest and abdomen. This diaphragm contracts to pull air into the lungs.
- **Chickens** don't have a diaphragm, and their lungs can't contract. They breathe by moving their entire ribcage to draw air into the lungs.
- That's why you can accidentally stop a chick from breathing if you hold it with a firm grip.



Chicken Respiratory Defense System

- As part of the avian immune system, the chicken respiratory tract normally is equipped with defense mechanisms.
- **The purpose of the Respiratory Defense System:**

1. Prevent or limit infection by airborne disease.
2. Remove inhaled particles.
3. Keep the airways clean.



Types of defensive mechanisms in the Respiratory System:

1. **Cilia**: responsible for propelling entrapped particles for disposal.
2. **Mucus secretions**: important for the efficiency of ciliary activity.
3. **Scavenging cells**: that consume bacteria and kill them.

Threats to the respiratory system are:

1. **Dust** from bedding, litter, feed, dried droppings, and feathers.
2. **Toxins** in the air from air pollution and smoke.
3. **Ammonia fumes** produced by bacteria when they digest on chicken droppings.
4. **Fungi** and **molds** in the air.

✓ **Ventilation** is an essential step in Poultry Farming. When the immune system is busy fighting dust particles, it can be susceptible to infections with viruses and bacteria.