



**TO
ONLINE TRAINING
ON
ASCITES**

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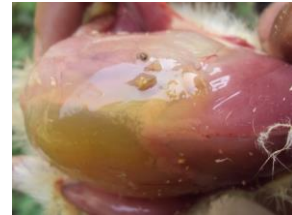
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ASCITES

- The Ascites syndrome in broiler has been increasing at an alarming rate, and it become a leading causes of mortality and Carcass condemnations throughout the world.
- Ascites represents a spectrum of physiological and metabolic changes leading to the excess accumulation of fluid in abdominal cavity.
- These changes occur in response to a number of dietary, environmental and genetic factors



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ASCITES

- The term "Ascites" refers to the fluid accumulation in abdominal cavity: so-called "water belly".
- The disease is more scientifically known as pulmonary hypertension syndrome.
- Ascites emerged as the major reason of Economic Loss in Broiler Industry, especially during winter months & in farms of high altitude
- Mortality of 5 -12% is common and may go up to 25% in extreme cases along with huge Carcass Condemnation
- Reported 1st time in 1968 in high altitude broiler farm of Bolivia, South America, followed by Peru, Mexico.
- Since then Ascites has also been reported in broiler reared at low altitudes of all countries of the world including India, Bangladesh & Nepal



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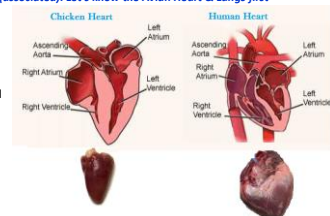
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AVIAN HEART & LUNGS

Ascites is a syndrome due to metabolic dysfunction, not a disease and is related to (dis) function of Heart (mainly) & Lungs (associated). Let's know the Avian Heart & Lungs first

- The Left ventricle of bird is much thicker than the mammals.
- The right ventricle is thin walled & small
- The atria is large & thin walled
- The thin walled right ventricle is meant to work as a volume pump, not as pressure pump
- Right ventricle responds very rapidly to an increased workload or pressure by dilatation, thickening & enlargement (Hypertrophy)



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HOW HEART MUSCLES RESPOND TO INCREASED WORKLOAD?

- The Heart muscles respond to increased workload by Enlargement (Hypertrophy) which then has increased muscle mass.
- In case of Ascites, there is an increased demand of Oxygen resulting an increased volume of blood in the system leading to enlargement of whole heart. The heart mass increases but the wall not thickened



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FACTORS RESPONSIBLE FOR ASCITES IN POULTRY

There are **basic differences in Respiratory System** of Mammals & Birds

- The Lungs of birds can not expand like mammalian lungs because they are rigid & can't enlarge, and also they are fitted tightly into the thoracic cavity
- The capillaries (minute blood vessels) can enlarge very little and can not accommodate increased blood flow like mammalian lungs. They have restricted space for blood flow
- The lungs of chicken grows slowly compared to the rest of the body. This slower growth of lungs, compared to the body mass, makes them prone to Ascites

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WHY ASCITES ONLY IN BROILER?

- Modern Broiler has Rapid Body Growth rate, High Feed Conversion Efficiency and large Breast muscle; everything requires a high oxygen demand makes them vulnerable to ascites
- The metabolic rate of broiler is very high, and thus a simple imbalance between oxygen supply & oxygen required to sustain that fast growth & high feed efficiencies results ascites in broiler
- Modern broiler has small lungs compared to the body mass, which makes it's respiratory system unable to meet the increased oxygen requirements
- Together these factors create oxygen deficiency (Hypoxaemia) in blood, and make the broiler victim of Ascites. Thus Hypoxaemia (Insufficient Oxygen in blood) is the major factor in the development of Ascites.



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WHY ASCITES ONLY IN BROILER?



- The red blood cells (RBC) of Broilers are more rigid than those of layers; they are less flexible and can't change shape
- Broiler has a thicker blood-gas barrier than layer; the partition in the exchange of Oxygen between the air capillaries of the lung and the blood capillaries are thicker which makes the broiler less efficient in Oxygenation of lungs
- Oxygen Saturation of Haemoglobin is less efficient in broiler than layer
- Broiler is more prone to "Oxidative Stress"; more vulnerable to harmful effects of 'Free radicals'. There are lower levels of Antioxidants found in Liver & Lungs of ascites affected Chicken

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CONTRIBUTING FACTORS FOR ASCITES

Anything Causing **REDUCED OXYGEN SUPPLY** and/or **INCREASED OXYGEN DEMAND** Results **HYPOXAEMIA**; Leads to Development of **ASCITES** in **BROILER**

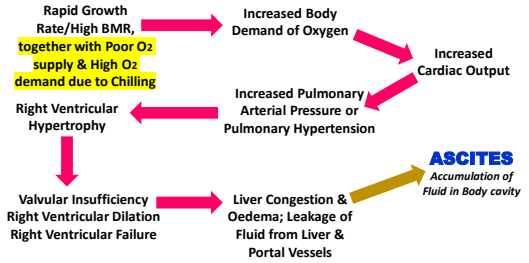
- Cold Climate; Increased metabolic rate with increased oxygen demand
 - Poor Ventilation results insufficient oxygen supply especially during winter months with Poor Temperature maintenance
 - High Litter Ammonia & Dust in Poultry House
 - Disease like Aspergillosis (Brooder Pneumonia), IBH
 - Mycotoxins affecting Liver
 - Faulty Brooding
 - Overcrowding
- Causative Factors**
- Fast growing broiler with smaller lung capacity
 - High Energy pelleted feed to reach the targeted performance
 - High altitude environment
 - High Sodium & low Phosphorus feed formulation
 - Heat/Cold Stress resulting increased oxygen demand
 - Vitamin E/Selenium Deficiency
- Aggravating Factors**

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DEVELOPMENT OF ASCITES



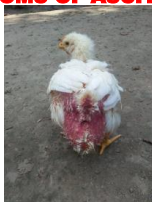
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SYMPTOMS OF ASCITES

- Sudden Death without showing symptoms is common finding
- Peak Ascites problem with high mortality occurs after 26 days age
- Poor Growth
- Ruffled Feather
- Pale Head & shrunken comb
- Abdominal Distension with increased Respiratory rate and Reduced Exercise Tolerance
- Difficult Breathing, Dyspnoea
- Moderately affected birds show Cyanosis; Bluish discolouration of skin
- Reluctant to move, Cyanotic birds die spontaneously when excited



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POST MORTEM FINDINGS IN ASCITES

- Presence of Large amount of clear yellow fluid in the body cavity (Water Belly) with or without Fibrin clots
- The Heart is markedly enlarged; both left & right atrium side and Right Ventricular enlargement
- Hydropericardium may be seen



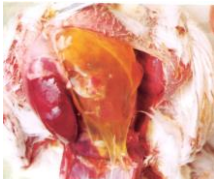
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POST MORTEM FINDINGS IN ASCITES

- The Liver may be Congested & Swollen OR firm & shrunken with irregular surface
- The Lungs are extremely congested & Oedematous



- Not all the birds die from Ascites show accumulation of fluid in the abdominal cavity. Death occur before symptoms develop due to Cardio Respiratory failure

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TREATMENT OF ASCITES

- There is **No Effective Treatment for Ascites**, once birds show symptoms, death is bound to come and fairly quickly
- Frusemide may be used as Diuretic to reduce mortality which decrease fluid & electrolyte retention and reduces pulmonary vascular resistance. Frusemide act as Vasodilator to dilatation of blood vessels
- Antioxidant like Vit C, Vit E & Organic selenium are effective in reducing mortality on account of their capacity to minimize Oxidative Stress & formation of Free Radicals

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CONTROL OF ASCITES

Improve O₂
Supply
throughout
the Growing
Period

Reduce
NH₃, CO₂ & CO
in Brooding
House

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CONTROL OF ASCITES

- Ensure adequate Ventilation in Poultry house throughout the Growing period, especially during Brooding. Ascites is very common during Winter months in open system broiler farms because of Compromised & Inadequate Ventilation on account of Low Temperature Brooding due to Poor Heat sources
- Avoid Chilling or Exposure to Cold during Brooding period. The Chicks are susceptible to Cold Stress during early part of life and this Chilling increases metabolic rate which requires more oxygen to raise body temperature. But oxygen supply can not be increased in a poultry house where chicks are already suffering Chilling



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CONTROL OF ASCITES

- Minimize Dust & Ammonia in poultry house environment to reduce irritants to lungs by proper Ventilation, Litter Management & Gut Health management
- Minimize Mycotoxin contamination level to protect liver
- Judicious Feed formulation to control Sodium level
- Increased level of Arginine, Vit C, Vit E & Selenium help reducing loss due to ascites
- Feed Restriction in terms of Quantity and/or Energy content, but through sacrificing Growth & Efficiency
- Lighting Program in Climate control farm by intermittent lighting help reducing Ascites incidence



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THANK YOU

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