



Pathological investigations of disease conditions in broiler chickens predisposed to dust in dry season

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Masters of Science in Pathology**

Department of Pathology and Parasitology

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Chattogram Veterinary and Animal Sciences University

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June 2023

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June 2023

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**Dedicated
to my
Parents**

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List of abbreviations and symbols

Abbreviation	Elaboration
%	Percent
µm	Micrometer
AL	Avian Leucosis
ALT	Alanine Aminotransferase
CFU	Colony Forming Unit
COS	Chronic Obstructive Syndrome
CRD	Chronic Respiratory Disease
CVASU	Chattogram Veterinary and Animal Sciences University
°C	Degree Celsius
d	Diameter
DLS	Department of Livestock Services
DPP	Department of Pathology and Parasitology
DPX	Dibutylphthalate Polystyrene Xylene
<i>E. coli</i>	<i>Escherichia coli</i>
GDP	Gross Domestic Product
gm	Gram
IB	Infectious Bronchitis
IBD	Infectious Bursal Disease
IL-1β	Interleukin 1 Beta
IL-6	Interleukin 6
LDC	Least Developed Countries
LPS	Lipopolysaccharide
m ³	Cubic-meter
mg	Milligram
mRNA	Messenger Ribonucleic Acid
ND	Newcastle Disease
ODTS	Organic Dust Toxic Syndrome
PAMP	Pathogen Associated Molecular Pattern
PH	Pulmonary Hypertension

PM	Particulate Matter
RVH	Right Ventricular Hypertrophy
T3	Triiodothyronine
TNF- α	Tumor Necrosis Factor Alpha
UN	United Nations
VOC	Volatile Organic Compound

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Abstract

Dust is a common pollutant present in the air of poultry houses. These dust particles has a great impact on the health of the birds. This study aims to find out the pathological effect of dust in chickens. In this study, the pathological investigation was carried out by studying tissue samples taken from dead birds with the history of using sawdust as litter material in poultry houses during the dry season. A total of 168 samples were collected from 83 affected birds over the period of November 2021 to April 2022. Gross pathological findings include congested trachea, lungs, and liver. Ascites is also observed in most cases. Microscopic examination revealed congestion, hemorrhage, infiltration of inflammatory cells, deciliation, and desquamation of lining epithelia in the trachea. The presence of dust particles surrounding the alveolar lining and metaplasia of alveolar lining epithelia was observed in lung sections with severe congestion, inflammatory cellular infiltration, emphysema, and pulmonary edema. Coagulation necrosis and marked congestion around the central vein were identified in liver tissues. In conclusion, the respiratory system of poultry is irritated by dust, leading to pulmonary hypertension and ascites, which can cause severe discomfort and pain, and may result in death.

Keywords: Sawdust, lung, liver, congestion, ascites, microscopic lesions, broiler chickens.