



Short Research Article

Poultry dust allergy - an article

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Abstract

Poultry dust found in poultry dust is a mixture of organic and inorganic particles, including the type of birds, their reproductive cycle and the work activities in poultry house that include bird feed, bedding material, bird droppings, dead skin, poultry dust mites, bacteria, bacteria, fungi, fungus, spores, and endotoxins. The dust inhaled by poultry house workers declines the respiratory functions, affecting lungs, respiratory tract. Breathing system which includes mouth, nose, lungs and the respiratory tubes that connect them, causing occupational asthma. Good working practices, prevention during work, using equipments and controlling exposures to poultry dust, managing contractors can control the occupational asthma. The health surveillance is also laid to protect the health of individual poultry worker to minimize the exposure of poultry dust.

Keywords: Poultry dust, allergy, occupational asthma, working practices, health surveillance.

Introduction

The Poultry dust found in the poultry farm is a mixture of organic and inorganic particles, bird's feed, bedding material e.g. wood shreds or straw, bird droppings, feather, dander (dead skin), dust mites and microorganisms such as bacteria, fungi, moulds, fungus, spores and Endotoxins. This dust production also depends on the types of birds, during the work activities and the growth or reproductive cycle of birds. This dust is inhaled by the workers; a fraction of airborne materials enters in the respiratory tract causing breathing disease. The poultry dust includes:

Bacteria: The bacteria may develop from soil or poultry dust which is generally present in agricultural environment, farm beddings, from feed, litters, faecal or skin, micro flora, zoonotic agent's and from birds itself etc. A bacterium comprises risk to the health of the workers effecting immunologically, and through infection to the respiratory system (Figure-1).



Figure-1: Bacteria.

Fungi: In the poultry dust fungi may also derived from the soil and dust found in the poultry house. The workers that are exposed to certain substances in the work place e.g. grain, storage, mites and fungal spores. These substances are called respiratory sensitizers or "asthma-gens" and producing some of the constitutions of poultry dust (Figure-2).



Figure-2: Fungi.

Endotoxins: Bacteria secretes endotoxins that are toxic substances consisting of lipids that are located within a cell. At all stages of reproductive cycle the endotoxins are present in the poultry dust and are released after the breakage of the cell wall of gram negative bacteria. The exposure to endotoxin at work may reduce lung function (Figure-3).

Activities degenerating poultry dust

The poultry dust's formation depend upon several things, e.g. the going up of production system, the kind of house, the

different age type of birds in the poultry farm, and the work itself¹. Apart of these there are several major, routine and some typical activities that generate poultry dust which is capable of causing respiratory disease. Following are some activities: i. Laying down on ground bedding and spreading of straw and wood shavings, ii. Shifting young birds into poultry houses at different stages, iii. Routine maintenance and cleaning, iv. Loading poultries, depopulating or catching and vaccinating birds, v. Manure removal and dispatching, vi. Cleaning of poultry houses after depopulation.

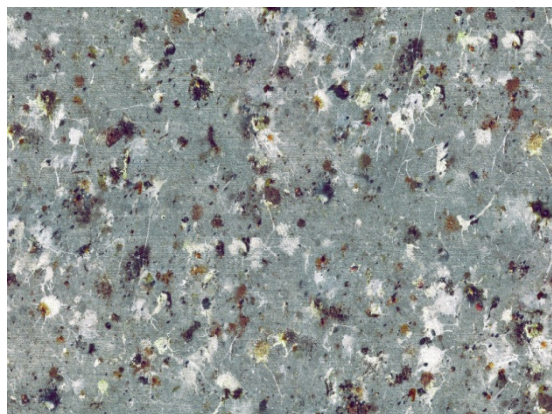


Figure-3: Bird Droppings.

Respiratory Disease

Respiratory Disease is a disease that affects lungs, trachea and the breathing tubes. The workers working in poultry farm and in agriculture faces a major occupational health risk. Previous studies had shown that poultry workers exposed to the poultry dust can be significant to the disease called occupational respiratory disease or occupational asthma². The occupational asthma affects the respiratory system that includes mouth, nose, lungs, trachea, and the respiratory tubes.

Symptoms: The occupational asthma is a type of allergy that takes several months or even years to develop breathing problems. The symptoms may arise from eyes itching, watering, or redness. The nasal symptoms, itching, sneezing, runny, or blocked nose may be reported by the farm workers. They may experience airway swell, chest tightness, or breathlessness, symptoms of coughing, wheezing, and throat discomfort. They may get flu like symptoms like headache, fever, and muscle ache. The people having previous asthma can face worsen symptom. If they were working for prolonged and repeated periods and exposed to high concentrations of poultry dust, may cause occupational asthma affecting nose, throat, airways, and lungs³.

Controlling exposure to poultry Dust

Lung function and allergic disease symptoms are generally found in poultry workers when they are working for a long period or repeated exposure to the high concentrations in

poultry dust. There are some precautions and good working practices for occupational standard for poultry farmers.

Avoiding respiratory disease: One should follow good working practices, and proper set up. Should immediately report symptom of respiratory illness, and concern to the doctor for health problems.

Protect Airways: Respiratory tract can be protected by adapting the proper 'Respiratory Protective Equipment' (RPE) for the work, example wearing masks for protecting dust, helmet, visor, air-fed hood, and visors, etc. with proper face-fit tested⁴.

Managing RPE by contractors: By managing RPE, contractors help the poultry farmers to understand the farm duties legally for health and safety while working on their farms, e.g. spreading litter, catching the poultry birds, removing manure, and while cleaning the poultry houses etc. Managing RPE manages all the risks properly. Both the contractor and their workers have equal responsibility for managing the health and safety that includes suitable equipment and machinery. Regarding adequate protection of workers including the nature of the work and the working environment, worker's health and safety can be ensured by wearing face mask, facial hair, and spectacle wears for the risk of eye infection etc.

Health Surveillance

Respiratory diseases caused during various farm activities are preventable. The occupational respiratory disease may possibly develop into permanent breathing problems, may cause disability, and make them unable to work. This not only affects the individual workers, but also affects the employees and poultry industry too. But by the help of 'Health Surveillance' and by following the guide-lines in set-out of controlling exposures to poultry dust⁵ (ASO), and by maintaining occupational hygiene standard of good working practice. These are the simple cost effective steps that can be taken to avoid respiratory disease at work, and by using 'avoid, protect and check approach' for the health and safety of employers and workers. The main objective of the health surveillance is to protect the health of individual workers which may depend on the particular degree and the circumstances of exposures, its level, frequency and duration, and finally identified by the risks assessments⁶.

Results and discussion

The poultry dust consists of some organic and inorganic substances and is formed by the bird droppings (Figure-3), soft-wood shaving or shreds (Figure-4), straw (Figure-5), bird's feather or dander or dead skin shreds (Figure-6), dust mites (Figure-7), Fungi in the form of moulds (Figure-8), and the bacteria that develop on the dust obtaining moistening from the environment⁷. The bacteria or endotoxins are the part of cell walls of bacteria and are present in poultry dust as bioaerosols

may constitute risk to worker of poultry form affecting their health, causing infection to the respiratory system⁸. Like bacteria fungi is the other element present as bioaerosols which is also derived from dust and soil of poultry dust, and if present in large number, may cause immunological challenges to the respiratory system⁹. The long term existence and exposures to these in-borne fungal stored pores coming in the range of agricultural environment recognized to decline the lung function causing allergic diseases such as asthma and alveolitis or lung disease¹⁰. During the work activities in the poultry industries whether bird rearing or evacuating birds, whether spreading of straw or softwood shreds, or whether general maintenance and other service activities, the poultry industry workers are directly exposed to the dust which is present their in the poultry farm and inhale the bioaerosols resulting infection in lungs, trachea, the alveolar tubes and the whole respiratory system that lead to occupational asthma¹¹. Finally the occupational asthma may be controlled by recognition of the specific hazards, applying good industrial practices such as wearing proper respiratory protection equipments like masks properly fitted to face. Also by reducing the exposures, use of proper respirators against poultry dust, and proper consequences should apply for the health of the workers by immediate hospital consultancies.



Figure-4: Softwood shaving/shreds.



Figure-5: Straw.



Figure-6: Bird's Feather / Dander.



Figure-7: Mites.



Figure-8: Poultry Farm House.

Conclusion

Thus the poultry dust that contain many different types of airborne particles, including organic and inorganic particles which collectively called poultry dust when inhaled by poultry house workers cause's infections in lungs and the respiratory

tract. Exposures to the Grain, storage feed, mites and fungal spores might cause allergic reaction, can bring change in people's airways, create the hypersensitive states and further exposure to the substances, and may cause asthmatic attack even at low level.

'Occupational Asthma' is another breathing problem raised in poultry house workers may persists longer causing permanent breathing problems effecting individual workers, the employees and poultry industry also. And the occupational asthma can be controlled by controlled poultry exposures and good working practices during work in poultry farms. Also the health surveillance can be followed by the appointees for the individual poultry worker to overcome this major hazard.

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