Research Paper Home Science

Impact of Environmental Parameters on the Worker's Work Capacity Involved in Organized Poultry Farm

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ABSTRACT

The aim of the study was to evaluate the exposure to toxic chemicals, moulds and house dust in poultry farm and related health effects in poultry workers. The study involved sixty poultry workers and thirty physically fit workers for experimental data collection. Working environment was evaluated on the basis on humidity, moisture, noise, temperature and various other factors. In workers eyes, skin, respiratory symptoms, ventilator lung function, bronchitis, allergic reaction, dermatitis were assessed. Various physical factors in the work place such as noise, vibration and micro climate condition and its adverse impact on health were also studied. It has been found through research that comfortable environmental parameters which include many factors such as noise, temperature, humidity, light also affect the physiological cost of work. Environmental parameters have a profound effect on human performance, efficiency and efficacy. Temperature, humidity, light, sound ranged from 22.5 to 28.5 degree centigrade, 43% to 58%, 15 to 105 lux and 82.3 to 110.2 dB respectively. In comparison to control subjects, significantly higher prevalence of work related nose, asthma, eye and skin symptoms and slight decline in ventilator lung functions was found in poultry workers. Extreme of noise may be physically hazardous. High temperature particularly if combined with a heavy physical work load, high humidity or low air speed may lead to dehydration, exhaustion, collapse, abnormality of cardiac function and variety of other problems. Hazardous level of temperature and sound was found which was slightly higher than the normal. The work environment inside the poultry farm was very dusty, bad odor, and poor air quality which resulted in asthma and allergic reaction.

Keywords : Poultry workers, Environment, Humidity, Moisture, Noise, Temperature, Bronchitis, Dermatitis

1. Introduction

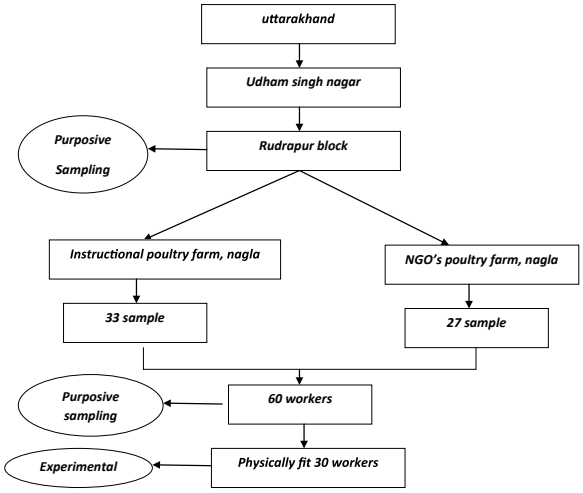
Agricultural workers specially pig and poultry farmers are at increased risk of occupational respiratory diseases (Kogeuinas et al.1999). Exposure to organic dust is one of the most recognized respiratory hazards associated with animal production, dust, bacteria, moulds; endotoxins and ammonia are considered central elements in daily exposure of agricultural workers. These substances are known to cause allergic and non allergic rhinitis, asthma, extrinsic alveolitis organic dust toxic syndrome and can also induce chronic bronchitis (Radon et al. 2001). Epidemiological studies showed increased prevalence of respiratory symptoms and adverse changes in pulmonary function parameters in poultry workers (Radon et al. 2001; Rylander and Carvalheiro, 2006).little is known, however, about the occurrence of sensitization to allergen common in poultry houses. Although pyroglyphid ("house dust") mites may be present in bird nests including poultry houses, exposure to house dust mites in poultry farms is not well defined and occupational health risks of exposure to these ubiquitous allergens have been rarely studies so far.

In the present study we evaluated the exposure to adverse environmental condition on two poultry farm. Health effects of occupational exposure to organic dust in poultry workers, including allergic sensitization and effects on respiratory system were also examined.

2. Methododology

Subjects and study protocol

Two poultry farm was purposively selected for the present study namely: Instructional Poultry Farm,Nagla and NGO's Poultry Farm, Nagla, Udham singh nagar district, Uttarakhand. Simple random sampling without replacement was used to select the study area and workers. Sample size was determined before the data collection. For the descriptive data the sample size of 60 was selected and 50 percent of the total sample was selected for experimental data. Descriptive data was collected personally by using the interview schedule method. Experimental data like moisture, temperature, light and noise was also taken while performing the different activities in poultry farms. All the subjects volunteered for the study. They were informed about the study. The study protocol is presented in figure.



Environmental monitoring was conducted in the month of January and February in two poultry farm. There was no proper ventilation in the cages; air temperature, relative humidity and light intensity were measured with the instruments called thermo hygrometer, lux meter, and noise level meter respectively. The precoded interview schedule and observation sheets were developed to record and gather the data regarding the environmental parameters. Questionnaire recorded report on occurrence of respiratory problems, work related eyes, skin and general symptoms during the last six months. Eye symptoms included eye itching and lacrimation;

nasal symptoms included sneezing, rhinorrhea, nasal itching and nasal obstruction (not related to common cold); asthmatic symptoms included wheezing and dyspnea, skin symptoms included itching, rashes and general symptoms include fever and joint pain.

Result

Environmental measurement: environmental parameters in two poultry farm are presented cumulatively in table.

s.no.	Environmental parameters	Range	
		maximum	minimum
1.	Temperature	28.5	22.5
2.	Humidity (%)	58	43
3.	Light (lux)	105	15
4.	Sound(dB)	110.2	82.3

Environmental parameters such as temperature, humidity, light and sound have profound effect on human performance, efficiency and efficacy. Environmental parameters considered under study were average but the temperature and sound level was little bit higher inside the poultry house. Extreme of temperature may be [physically hazardous. High temperature particularly if combined with a heavy physical work load, high humidity or low air speed may lead to dehydration, exhaustion collapse, abnormality of cardiac function and variety of other problems. (Leithead and lind,1964). The humidity was average but the temperature was little higher. It was reported that the temperature will rise during the summer season which was hazardous to health. Since the study was conducted in winter season, the temperature ranged from 22. 5 to 28.5 degree centigrade. During the cource of data collection.

An important threat facing the poultry industry is noise control. Noise emmited from fans, feeders, farm equipment and truck delivering inputs and removing outputs from the poultry farm can be an annoyance to neighbors and if severe enough can lead to complaints. Noise is considered to be potential threat to the hearing at levels in excess of 85 to 95 dB (Pheasant, 1987). The sound level ranged from 82.3-110.2 dB, the higher value was considered hazardous but the workers did not have any problem with this level of sound as they were used to it. The noise levels are also recommended by the World Health Organization (1980). In environment the recommended noise level is 55 dB during day and 45 dB during night. Similiaraly for indoor it is 45 during day and 35 during night.

General lighting is basic necessity demands were considered as 20-200 lux (CIE, ISO, 1999). The luminance level ranged from 15-105 lux in the working area. Along with this for clear visibility without any stress and strain, the light level should be proper to make the worker feel comfortable. The recommended light level for rough work (50-100 lux), moderately precise work (250-500 lux), precise work (500-1000 lux) and for every fine work (1000-2000 lux) Grandjean, 1975.

Conclusion

It can be concluded through the whole research that the environmental conditions in the poultry farm were found to be within comfortable limits or lie close to it except temperature and humidity which was slight higher than normal. The work environment inside the poultry farm was very dusty, bad odor and poor air quality. About 30 percent of the respondents were having the respiratory problems that included asthma and allergic reaction.

Poor air quality, elevated level of odor, noise level does not affect their working frequency as they were accustomed to it the workers, who were working since long years were facing the problems like asthma, allergic reaction and numbness.

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