Research Paper

Volume : 2 | Issue : 9 | September 2013 • ISSN No 2277 - 8179

Cement Factories and Livestock Health - a Mini Review

Environmental Science

KEYWORDS : livestock; pollutants; respiratory; problems; diseases.

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ABSTRACT

Cement factories releases an enormous amount of pollution in the form of gases, particulate, dust and heavy metals having adverse effects on whole environment including livestock. The livestock industry plays a significant role in gross domestic product (GDP) of the nation, which needs utmost care. However due to negligence of various sectors including government as well as private, the conditions of the livestock health is getting worsened. The prevalence of various pollution related diseases such as respiratory infections is increasing at an alarming rate in the Cement affected areas and need is to take proper steps to overcome adverse impacts.

INTRODUCTION

Cement is most widely used concrete material throughout the world. The discharge of cement factories generally consist of Particulate matter, Sulphur dioxide and Nitrogen oxides producing continuous visible clouds which ultimately settle on the surroundings as a result the whole ecosystem around the cement factory is subjected to extraordinary stress and abuse. The cement kilns emit enormous amounts of cement dust into the atmosphere which settle around the cement factories. Gaseous and suspended air pollutants released from cement factories entered the body mainly through inhalation, as large particulates are generally precipitated on the surface water and vegetation which are mostly ingested by animals. The inhaled pollutants of less than 1micron size get absorbed into the body and particles of 1-3 micron size are efficiently deposited (Nielson, 1971). According to the literature it has been estimated that there is high diseases prevalence in cement polluted areas as there are high levels of particulate matter, various oxides of nitrogen, sulphur and carbon with high levels of heavy metals such as chromium, nickel, cobalt, lead and mercury pollutants hazardous to the biotic environment with impact for vegetation, human health, animal health (Curtis, 1981; Baby *et al*., 2008).

Besides adverse impacts on humans and plants, various diseases were seen in livestock due to cement pollution such as bronchitis, calf pneumonia, coughing /wheezing, eye irritation, liver abnormalities, and dermatological / skin problems, impairing of reproductive function, high prevalence of sterility, repeated oestrus cycle, stillbirths and birth to weak calf in dairy cattle (Van Rensburg *et al*., 1966; Sana, S. 2013). Besides these some morphological changes were seen occurring upon peritoneal cavity, subsiding effects, formation of granuloma around the un-eliminated dust particle, with collapse and fibroblastic proliferation due to the air which was polluted with toxic gases (Kolev and Shumkov, 1975). Analysis of dust from the lungs and lymphnodes showed the presence of mercury (Hg), iron (Fe), copper (Cu), Zinc (Zn) and Lead (Pb) in appreciable quantities, because of cement dust body weight gain gets depressed and lesions of the humerus bone along with osteonecrosis, thinning of cortex and reduction of epiphyseal cartilage, asthma, allergic rhinitis, alveolitis, rhinitis, chronic bronchitis, diarrhea, reduced growth and weight, bilateral periorbital alopecia, multifocal alopecia, excessive lachrimation and declined fertility with shorter life span was found (Pond *et al.*,1982; Clark *et al.*,1983; Reichrtova,1986; Parada *et al*.,1987). Lead which is an important heavy metal released from cement processing acts on nervous system and shows highest toxicity. The lead – induced encephalopathy, characterized by cerebal oedema, proliferation of glial cells enhanced the immunogeneticity of neural proteins and causes neuronal degeneration, focal necrosis in livestock. Behavioural, learning, memory and locomotor defects were seen by small amount of lead in young animals, because of lesions caused by inhibition of adenyl cyclase and acetyl cholinesterase which causes imbalance of brain neurotransmitter such as nor epinephrine and acetyle choline (Goyer and Rhyne,1973; Kolev and Dimitrov,1973; Krishna Murti,1982; Maciejewska,1987). It has also been seen that cement dust particles inhaled by animals were accumulated in bones of the exposed animals, impact of fluorine on buffaloes revealed lower PCV, TEC and Hb. Besides various changes significant differences in species composition, relative density, relative length, importance value index and biomass were seen in cement polluted areas (Wang *et al*., 1992; Venkateswarlu *et al*., 1994; Waterman *et al*., 1994; Singh and Swarup, 1995; Tak and Bhat, 2009).

It has been concluded from the study that Cement industry is a major pollution problem contributor in terms of dust and particulate matter emitted at various steps of cement manufacture. Cement dust consists of many toxic constituents. Besides humans high rate of diseases were seen among livestock in the cement affected areas (Schwabe, 1984). It has been seen that the effect of pollution on animals is greater than that on man and the biocidal effects of polluted environment may sometime appear in animal species before people are affected.

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