Agronomy Research **16**(2), 582–592, 2018
https://doi.org/10.15159/AR.18.070

Diagnosis of air quality in broilers production facilities in hot climates

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Abstract. The objective of this study was to evaluate air quality of industrial farms of broilers production, located at Zona da Mata region, Minas Gerais, Brazil. The environmental air quality was evaluated during the last rearing week, between 35 and 42 days of life of broilers. Facilities with beds constituted by two types of substrates were evaluated: coffee husks (6 reuse cycles) and shavings (4 reuse cycles). A total of 30 facilities (3 per each of the 10 reuse cycles) were investigated. Air quality was diagnosed by determining air temperature and relative humidity and by ammonia and carbon dioxide concentrations. Air temperature and relative humidity were not affected by reuse cycles in coffee husks bed, but these variables were affected by reuse cycles in shavings bed. Ammonia and carbon dioxide concentrations increased linearly according to the reuse cycles for both types of bed. The maximum concentrations of ammonia and carbon dioxide were 25 ppm and 1,348 ppm in facilities with bedding of coffee husks and 10 ppm and 1,075 ppm in facilities with bedding of shavings, respectively. Air quality of facilities using coffee husk bed tends to be worse when compared to facilities using shavings bed due to the higher values of ammonia and carbon dioxide concentrations, as observed in this study. In conclusion, regardless bedding type, increases in reuse cycles tend to decrease air quality inside the facility, since a linear increasing in ammonia and carbon dioxide concentrations can be observed in relation to the number of bed reuse cycles.

Key words: air pollutants, air quality, gas concentration, livestock, poultry.

INTRODUCTION

Brazil is the second largest producer and the world's largest exporter of chicken meat, with 12.9 million tons produced in 2016 (ABPA, 2017). This intensive production