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Effect of ventilation opening levels on thermal comfort status of both animal and husbandman in a naturally ventilated rabbit occupied building

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abstract Three levels of ventilation openings (100, 30, and 50%) of inlet were considered in this study under a natural ventilation method for rabbit production. The study was conducted using a model animal building. The external and internal temperature and relative humidity were measured over the experimental period. The measure of thermal comfort within a locality was hence determined by temperature humidity index (THI) for both animal and husbandman while relative strain index (RSI) was also considered for man. The results showed that the amount of ventilation opening and building orientation have significant effects on the thermal comfort level of a building as indicated by the THI levels at 1% level of significance for both rabbit and man, which is also the same for the RSI for man. The larger the inlet opening and closer to perpendicular to the prevailing wind is the opening the higher is the thermal comfort level for both man and animal as seen in the values of THI for both rabbit and man and the RSI value for man in the case of 50% ventilation opening pens of the 90° orientation building. This may be attributed to the larger quantity of air passing through the building with increasing opening ratio. This affects the amount of heat and moisture that is removed from the building, hence the level of both temperature and relative humidity resulting in a more comfortable building internal environment for both animal and husbandman.

keywords building orientation, micro-environment, open- ing effectiveness, thermal comfort, ventilation