



Risk of Prophylactic Antibiotics in Livestock and Poultry Farms: A Growing Problem for Human and Animal Health

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Abstract

Veterinary antibiotics are physiologically highly active substances and being used on a large scale as therapeutic drugs and feed additives in modern agricultural practice. The major purposes are prevention and treatment of bacteria-borne diseases and improved growth rates of farm animals. Therefore, the present study was focused on quantification of some selected Tetracycline (namely Tetracycline; TET, and Oxytetracycline; OTC) and some selected Penicillin (namely Amoxicillin; AMX, and Amphotericin; AMP) and isolation of the antibiotic resistant bacteria. Twenty wastewater discharge drains in large-scale livestock and poultry farms were selected to collect samples for the study. Solid-Phase Extraction (SPE) was employed and quantification was done by High Performance Liquid Chromatography (HPLC). Isolation of resistance (r) bacteria was followed by standard pour plate method where Minimum Inhibitory Concentration (MIC) of bacteria was determined using 60-720 ppm concentrations of antibiotics by 96-well plate method and pour plate method. OTC (55%), and TET (38%) were recorded as most frequent antibiotic in samples and they were detected as 0.005 ppm and 0.004 ppm respectively. The highest concentration of AMX was recorded as 0.003 ± 0.004 ppm. However, AMP was not detected during the study period. OTC and TET resistance bacteria were identified as *Enterococcus* sp., *Enterococcus faecium*, *Escherichia coli* and *Clostridium* sp. while, *Acinetobacter baumannii*, *Enterobacter cloacae*, *Acinetobacter. lwoffii* and *Helicobacter.pylari* were identified as AMP and AMX resistance bacteria by 16S rRNA sequencing. The MIC values of tetracycline (TET, OTC) resistance bacteria ranged from 360 ppm to 720 ppm whereas for penicillin (AMX, AMP) was from 360 to 760 ppm.

Keywords: Tetracycline, Oxytetracycline, Amoxicillin, Amphotericin, Resistance