

ESTABLISHMENT OF A SCREENING TEST FOR ANTIBIOTIC RESIDUES IN ANIMAL PRODUCTS

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Antimicrobial drugs are often used in food producing animals to treat or control diseases and in growth promotion. This practice may lead to indiscriminate use of antibiotics by farmers and as a result occurrence of drug residues in food of animal origin. The adverse effects of such residues include direct and indirect toxic effects, consumer resistance and trade implications. At present Poultry industry is developing rapidly in Sri Lanka and further improvements should be made to meet the requirements of the export market. Therefore it is necessary to establish a residue-monitoring programme, to ensure the chemical quality of poultry products.

Initially the European Union Six-Plate Test was established to screen residues of 6 different groups of antibiotics. This assay was carried out using *Bacillus subtilis* BGA (Merck), *Bacillus cereus* (ATCC11778), *Micrococcus luteus* (ATCC9341) and *E. coli* (ATCC11303) as indicator organisms.

Initially the spore suspensions of *B. subtilis*, *B. cereus* and bacterial suspensions of *Micrococcus luteus*, *E. coli* were prepared and stored at 4^o C. EU Six-Plate Test was slightly modified to use Mueller Hinton medium as the test medium at optimum pH for different organisms. In order to improve the sensitivity for detection of Sulphonamide, Trimethoprim (10µg/ml) solution was added to pH 7.2 medium seeded with *B. subtilis*. The control antibiotic discs including benzyl penicillin, sulphadimidine, streptomycin, erythromycin, chlortetracycline and ciprofloxacin were used along with respective assay plate.

Hundred and seventy-three samples which include 3 different matrices (i.e. Muscle, kidney, liver) were screened by the Six-Plate Test. Among the samples 72.84% was randomly collected at the processing points thus the 3 matrices were originated from a single bird. Whereas the rest of the samples (27.16%) were collected at retail market and represent unrelated matrices.

Out of the 173 samples tested 37(21.38%) had given positive results showing zones of inhibition on test agar plates. The positive matrices include 7(4.04%) breast muscles, 9(5.23%) kidneys and 21(12.13%) liver tissues. Out of the positive samples 71.31% were suspected of having residues of betalactam group antibiotics. The rest of the positives (28.69%) were suspected of having tetracycline residues. However there is a possibility of getting false positive results due to leakage of inhibitory substances including lysozyme from kidney and liver tissue during cell death. Therefore qualitative screening test should always be coupled with secondary screening tests such as Thin Layer Chromatography and more appropriately with confirmatory tests such as High Pressure Liquid Chromatography (HPLC), Biosensors, Liquid Chromatography coupled with Mass Spectrometry (LC-MS) and Gas Chromatography coupled with Mass Spectrometry (GC-MS).