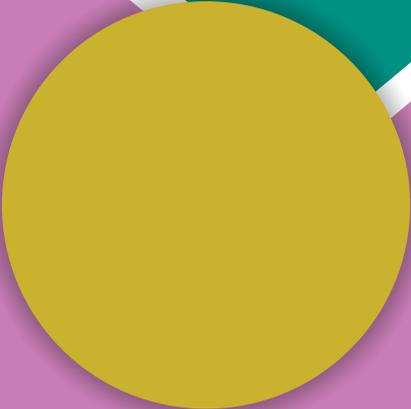


Development and
Standardization of Swab
Test on Animal Food (STAF)
for the Detection of Antibiotics
Residues in Meat, Milk and Eggs



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Indiscriminate use of antibiotics as therapeutic in the production of livestock and poultry reflect as residues in the animal food like meat, milk and eggs. Such residues in the animal food chain may pose different threats to the consumers; moreover the drug residues will also cause rejection or condemnation of the processed meat, milk and egg products thereby causing economic loss. For the detection of antibiotics residues in the animal food, the option of expensive and

time consuming methods like HPLC are in operation.

In parallel to the international US and European standards all the animal foods must be free from antibiotic residues or possibly under permissible concentration as detected through PHAST and STOP test respectively. We have developed and standardized STAF test technology applicable for better care of the quality and health safety concerns. This widely applicable microbiological test, was standardized to screen out animal foods (Eggs, Meat and Milk) containing antibiotics residues.

Swab Test on Animal Food (STAF) was developed indigenously for screening the animal foods for the detection of antibiotic residues. In this test local isolated culture of *Bacillus* was characterized and used as an indicator microorganism due to its high sensitivity to detect a wide range of antibiotics (sensitive to 30 antibiotics) commonly recommended for treating various animal disorders. In a separate study conducted in the Institute of Microbiology, UAF, the optimum concentration of 1×10^5 /mL (spore suspension) was established to promote reproducible results with best sensitivity. The medium was formulated which promoted the active growth of *Bacillus subtilis* (JS2004) at 30 °C under aerobic condition. Polystyrene plates were designed to hold the sterile medium along with the required organism culture intact and the ready to use plates are available for one month under refrigeration temperature. The STAF test technology was further improved in 2016 where the agar overlay method was found more suitable and results may be visible from 16 hours onward instead of 24 hours of incubation. Special nutrient agar was used to hold the spore suspension. At the specific concentration, the inhibition zone around Neomycin control disc remained around 16 mm which served as test control. Appearance of clear zones of growth inhibition around test swab samples containing absorbed food (within 16 hours) at room temperature was well illustrated in Plate A.

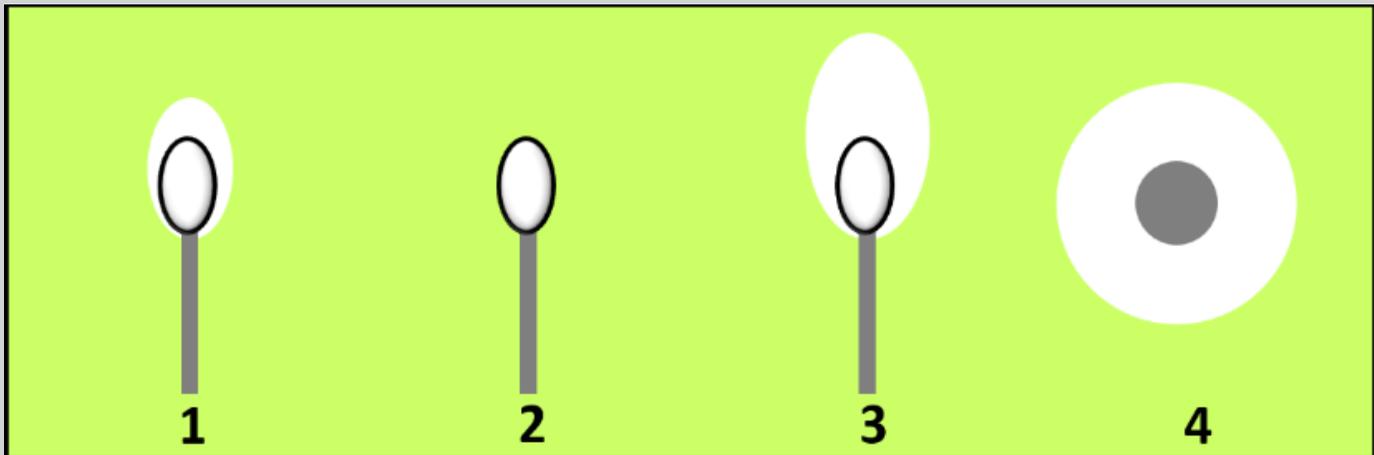


Plate A. Slide showing typical STAF test with three test samples (1,2 &3) and control (4) test pattern.

Results Interpretation:

1. Test swab with zone measuring less than 2 mm is considered as negative and indicating antibiotics residues present in food within the permissible level.
2. Test swab samples showing no zone of inhibition are negative for antibiotics residues.
3. Test swab samples showing more than 2 mm wide inhibition zone is considered as positive for the presence of antibiotic residues indicating the food containing the antibiotics beyond their permissible level thus declared as unfit for human consumption.
4. Neomycin (5µg) with more than 16 mm zone diameter is used as test control