Australian Government
Department of Agriculture and Water Resources

# BAX Automated System for Screening *Salmonella* in foods - AOAC 2003.09

## SCOPE

This method is applicable to:

- Frankfurters, raw meats, cheese and orange juice

## PRINCIPLES

This method uses a commercial PCR screening procedure. All samples identified as potentially positive for *Salmonella* using this test must be confirmed using AS 5013.10.

The detection of *Salmonella* spp. is broken down into four stages:

- **Pre-enrichment in non-selective liquid medium**
  A 1:10 dilution of the sample is enriched in buffered peptone water at 35 ± 1°C for 20-24 h (37±1°C is acceptable). Buffered peptone water should be warmed to room temperature or to 35°C for large volumes. For carcass sponges, buffered peptone is added to the moistened sponge to bring the total volume to 60-100 ml and the sample incubated at 35 ± 1°C for 20-24 h. No secondary enrichment is required for meat, poultry and seafood. In the case of sponges BPW need not be warmed to room temperature before being used to re-hydrate the sponge, for all subsequent additions BPW should be warmed to room temperature.

- **BAX system for screening *Salmonella***
  *Salmonella* is screened in the sample following the manufacturer's recommended protocol1. The BAX *Salmonella* test is an automated method that uses polymerase chain reaction (PCR) technology for the detection of *Salmonella* in foods. The system identifies a specific DNA fragment, unique to *Salmonella*. The DNA is combined with DNA polymerase, nucleotides, and primers. The mixture then undergoes a series of timed heating and cooling cycles. Heating denatures the DNA, separating it into single strands. As the mixture cools, the primers recognise and bind to the targeted DNA sequences. The DNA polymerase then uses the nucleotides to extend the primers, thus creating 2 copies of the targeted DNA fragment; repeating the cycle results in an exponential increase in the number of target DNA fragments. A fluorescent dye then binds with double-strand DNA and emits a fluorescent signal in response to light. After amplification, the BAX System begins a detection phase in which the fluorescent signal is measured.

- **Confirmation**
  In all cases of BAX-positive, BAX-indeterminate or a BAX-signal-error the BPW must be tested using AS 5013.10 (starting at the selective enrichment stage of the analysis). Confirmation must be carried out at a department approved laboratory.

[1] The FSIS use DuPont Qualicon kits #17710608.

## CHECKLIST

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| **Pre-enrichment** | Is the buffered peptone water warmed to room temperature (to 35°C for large quantities)? | _____ |
| | Is the correct amount of enrichment broth used for the weight of sample analysed? | _____ |
| | Is a positive control run with each batch of samples analysed? | _____ |
| | Are reference cultures inoculated into primary enrichment broth at a level of 10 to 100 cells? | _____ |
| | Is enrichment carried out at 35°C for 20-24 h (37± 1°C is acceptable)? | _____ |
| **BAX screening** | Are the manufacturer's instructions available? | _____ |
| **Confirmation** | Are all suspect *Salmonella* sent to a reference Laboratory (see AS 5013.10) to be serotyped? | _____ |
| | BPW should be supplied to off-site laboratories for confirmation following AS 5013.10 | _____ |
| | If *Salmonella* confirmation is done in-house refer to AS 5013.10. | _____ |