Introduction

Biochip array technology provides a platform that enables the simultaneous determination of multiple analytes with a single sample. It uses miniaturized assay procedures with implications in the reduction of sample/reagent consumption and cost-effectiveness of the tests. The core of the system is the biochip (9mm x 9mm), and represents not only the platform in which the capture ligands are immobilized and stabilized defining microarrays of discrete test sites, but is also the vessel where the simultaneous immunoreactions are performed. Applications of this technology have been reported (1-9).

The use of this technology is advantageous for the rapid and simultaneous screening of multiple residues that could be present in different foods and that could be incorporated in the food chain and the environment, as only positive results need to be confirmed. We report examples of applications of biochip arrays to different food matrices.

Methodology

The immunoreaction for the rapid detection of residues in food is applicable to the semi-automated bench top analyser Evidence Investigator™ (EV3602). Kits, calibrators, controls and Evidence Investigator™ were manufactured by Randox Laboratories (Crumlin, UK). Assays were performed following manufacturer’s instructions.

• For determination of residues, simultaneous competitive immunoreactions are employed for each biochip array.
• The capture molecules are immobilized and stabilized on the biochip surface defining microarrays.
• The biochip is also the vessel where the immunoreactions take place.
• The system incorporates dedicated software to process and archive the multiple data generated.

Results

Antimicrobial Array I Plus

Antimicrobial Array II

Antimicrobial Array III

Conclusions

• Data show applicability of biochip array technology to the simultaneous determination of residues per sample.
• Different biochip arrays designed for the rapid screening of residues.
• Applicable to different food matrices (e.g. honey, milk, tissue, feed).
• The same sample preparation method can be applied across a number of biochip arrays.
• With the semi-automated Evidence Investigator™analyser 54 biochips can be handled at a time and the system incorporates dedicated software to process and archive all the multiple data generated.
• Consolidation of many tests using a single platform, thereby enhancing the scope of tests and minimizing the environmental impact.

References