



# METHODS FOR TESTING FOOD PRODUCTS FOR PHARMACEUTICAL RESIDUES

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## Purpose and objectives

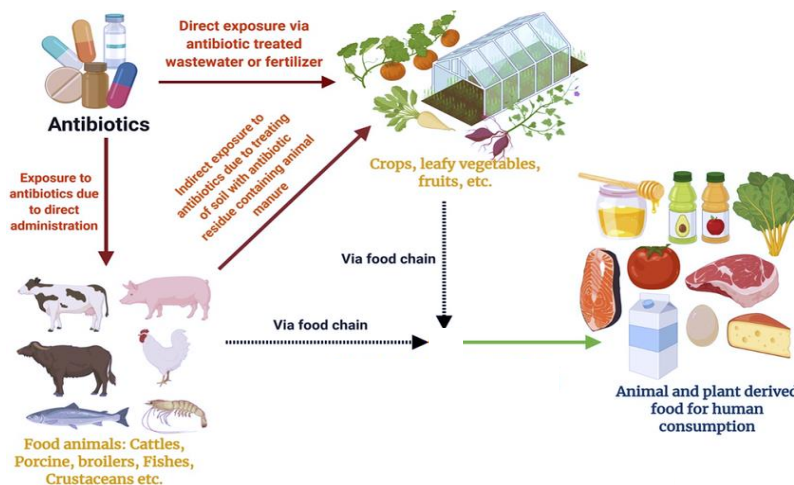
**Purpose.** Analysis and selection of reliable methods for the study of pharmaceutical residues in livestock and agricultural products.

**Objectives.** To review methods for the detection and quantification of drugs in food products.

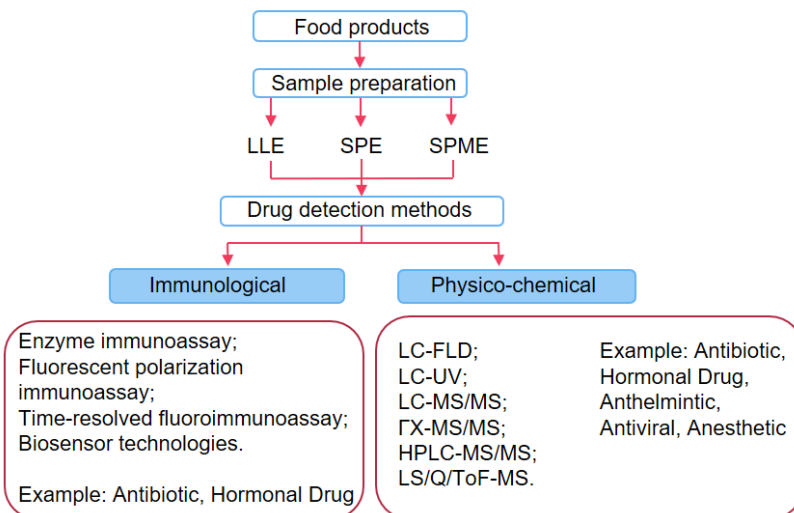
## Material and methods

The work used an information-analytical research method based on official documents defining the requirements for the quality of food products, as well as foreign databases **Scopus** (Woodhead Publishing Series in Food Science, Technology and Nutrition, Food Chemistry, Talanta, Iranian Journal of Pharmaceutical Research), **Web of Science** (Journal of Agricultural and Food Chemistry, Analyst), **PubMed** (Analytical and Bioanalytical Chemistry, BMC Chemistry, Food Additives & Contaminants: Part B: Surveillance, Antibiotics International Journal of Analytical Chemistry), **Google Scholar** (J. Sep. Sci, Acta Chimica Slovenica).

## Ways of drugs entering the food chain



## Methods for detecting drugs in food



## Main results

The most commonly used sample preparation methods are SPE, LLE, solid phase microextraction and QuEChERS extraction method, which reduce the volume of solvents used, increase sensitivity and selectivity [1]. The QuEChERS sample preparation method was used to detect banned veterinary drugs, namely chloramphenicol, malachite green and nitrofurans metabolites in shellfish at aquafarms and production sites in Taiwan. The method can detect 76 herbicides using GC/MS/MS and LC/MS/MS analytical methods, resulting in 19% of the tested samples being found to contain banned substances [2]. One example of using HPLC-MS/MS was established to determine 80 drug residues in food products, while also minimizing the matrix effect due to the use of isotopically labeled internal standards [3].

## Conclusions

The main methods of sample preparation are LLE, SPE and their modifications as the most reproducible and sensitive methods. The analytical methods used are LC, GC, capillary electrophoresis and ELISA, which have high speed and accuracy of detection of minimal amounts of drug residues in food products.