

Advice 18-2012 of the Scientific Committee of the FASFC on the contribution of the food chain to the transfer of antibiotic resistance to humans

In this advice, the way in which food can play a role in the transmission of antibiotic resistance to humans is examined. Also, it is explored what recommendations can be made regarding this issue.

Antibiotic resistance is common in bacterial strains isolated from humans, animals and food. There are several ways in which food can be contaminated with antibiotic resistant bacteria and/or genes. A first way is the presence of antibiotic resistant bacteria on the primary food products selected by the use of antibiotics during the agricultural production. A second route is the possible presence of antibiotic resistance genes in bacteria that are intentionally added (starter cultures, probiotics, bioconserving microorganisms and bacteriophages) during the production of food. A third route is via contamination with resistant bacteria during food processing. In this latter route, the attention is also drawn to bacteria that show, by the use of biocides in the food industry, in addition to the resistance to this biocides, also a cross-resistance to antibiotics.

Primary food products can be consumed without a prior processing or preservation technique and therefore hold the greatest risk for transmission of antibiotic resistance to humans, as the eventually present antibiotic resistant bacteria are not killed. Many foodstuffs undergo a minimal processing or preservation treatment, whereby a large part of the bacteria are killed but a smaller number of sublethal damaged or stressed cells can be formed. There are indications that stressing cells stimulates the transfer of antibiotic resistance genes to other bacteria. Many food processes are used to kill bacteria. Foods that have undergone such processing contain as such the smallest risk of transmission of antibiotic resistance.

Antibiotic resistant bacterial pathogens can be ingested by the consumer and constitute an increased risk to public health because of various reasons such as limitation of the therapeutic arsenal for treatment of diseases or the risk of treatment failure, flare of resistant gastrointestinal pathogens and finally a potentially greater chance of an increased virulence (for example by co-selection of resistance and virulence properties).

Antibiotic resistance genes that are present in food products, either enclosed in bacteria and bacteriophages, or in the form of DNA fragments, can present an indirect risk to public health, as they increase the gene pool from which (pathogenic) bacteria can pick up antibiotic resistance genes and transfer them to other (pathogenic) bacteria.

To keep the risk of transfer of antibiotic resistance to humans via food as low as possible, the advice also contains a number of recommendations.

The full text is available on this website in dutch and in french, respectively under the section "Wetenschappelijk Comité/Adviezen" and "Comité scientifique/Avis".