

Advice 29-2010 of the Scientific Committee of the FASFC on indications for the food related transfer of antibiotic resistance from animals to humans : study of resistance profiles and phage types of *Salmonella* Typhimurium from pigs and poultry, pork and broiler meat and humans

The Food Safety Agency (FASFC), the Scientific Institute of Public Health (ISP) and the Veterinary and Agrochemical Research Centre (VAR) collect yearly information on the serovar, phage type and fenotypic resistance of *Salmonella* spp. isolated in Belgium from food producing animals (only serovar and antibiogram), food products and humans.

In this advice, it is investigated whether these data can provide an indication for the transfer of antibiotic resistance from food producing animals (pigs/poultry) via the consumption of meat (pig meat/poultry meat) to humans. *Salmonella* Typhimurium was chosen as a case study. The genotypic comparison of *Salmonella* Typhimurium does not belong to the scope of this advice

The fenotypic resistance to nine antibiotics (ampicillin, cephalosporines, chloramphenicol, nalidixic acid, streptomycin, sulphonamides, tetracycline, and trimethoprim-sulphonamides) is compared between *Salmonella* Typhimurium isolated in Belgium from the feces of pigs (n=581), poultry (n=196), pork meat (n=255), poultry meat (n=43) and human feces/body fluids (n=1870) during the period 2001 from to 2006. Also the fenotypic resistance profiles and the combinations fenotypic resistance profile-phagetype are compared.

Fenotypic resistance to ampicillin, chloramphenicol, streptomycin, sulphonamides and tetracycline is commonly found (between 20,0 % and 76,7 %) with *Salmonella* Typhimurium isolated from pigs, poultry, pig meat, poultry meat and humans. Resistance to trimethoprim-sulfonamides is lower (respectively between 13,3 % and 20,9 % and between 0,8 % and 6,6 %). Resistance to cephalosporines was found sporadically (< 1 %) for all groups except for poultry meat. Resistance to fluoroquinolones is observed for *Salmonella* Typhimurium from humans (0,5 %) and pigs (1%) but not from those from other origins.

The high number of human *Salmonella* Typhimurium (92,1 %, 79,0 %) having a resistance profile that is also observed for the meat isolates (respectively pig meat and poultry meat) and the animal isolates (respectively pigs and poultry) supports the hypothesis of transfer of resistance from the animals (pigs, poultry) via consumption of meat (pork meat, poultry meat) to humans.

Comparison of the combinations resistance profile-phagetype demonstrates that more than 80 % of the *Salmonella* Typhimurium has a combination resistance profile-phage type that was found also for *Salmonella* Typhimurium isolated from human *Salmonella*. The corresponding percentage human isolates is 61,1 % (combination occurring also with the pork meat isolates) and 27,1 % (combination occurring also with the poultry isolates). These data support the hypothesis that both pig and poultry meat are an important source of transfer of resistant *Salmonella* Typhimurium to humans and of the transfer of antibiotic resistance properties.

The relative contribution of both food products to the transfer of *Salmonella* Typhimurium to humans can not be made based on the available data, e.g. because of the unequal number of isolates between poultry meat and pig meat in the analysis and the lack of supplementary molecular analyses.

Although the analysis performed in this advice, supports the hypothesis of resistance transfer for *Salmonella* Typhimurium from pigs and poultry via the consumption of meat to humans, it does not lead to independent conclusions and subsequently no generalization can be made to the transfer of resistance related to other bacteria or food products.

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