The CTX-M beta-lactamases in animals and the food chain

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The first report of CTX-M-containing bacteria of animal or food origin was in 2003 in Spain, concretely *Escherichia coli* isolates recovered from faecal samples of healthy chickens harbouring CTX-M-14.[1] Since then, an alarming increase in the detection of beta-lactamases of the CTX-M group in animal or food *E. coli* isolates is occurring,[2,4] either in food-producing animals or their food products, as well as in companion animals, or even in wild animals.[3] The prevalence of CTX-M-positive *E. coli* isolates in faecal or clinical animal isolates is variable depending on the studies, but some of them show very high prevalences in faecal samples of food producing animals in some countries, and also in other types of animals. The following CTX-M variants have been reported in the literature in animal *E. coli* isolates: poultry (more frequently CTX-M-14 and -1, followed by CTX-M-2 and -9, and less frequently CTX-M-32, -27, -15 and -8), swine and cattle (more frequently CTX-M-1, followed by CTX-M-14, and less frequently CTX-2, -3, -32, and -24), rabbits (CTX-M-9 and CTX-M-14), horses (CTX-M-1), dogs and cats (frequently CTX-M-1, and infrequently CTX-M-15), and wild animals (CTX-M-1, -14 and -32). CTX-containing *Salmonella enterica* isolates of animal or food origin have also been reported in different European countries as well as in Japan and the variants reported have been: CTX-2 and -9 in poultry, and CTX-M-2, -9, -14, and -32 in poultry derived foods. It is interesting to indicate that CTX-M-15, frequently detected in clinical *E. coli* isolates in human infections, is rarely detected in faecal samples of healthy animals or in food samples. CTX-M beta-lactamases are widely disseminated among *E. coli* isolates of the intestinal microbiota of different animals representing a reservoir of genes encoding CTX-M enzymes and the food chain could be implicated in the transference of CTX-M-positive bacteria to humans.

References

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