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## Veterinari Medicina

**Tetracyclines in veterinary medicine and bacterial resistance to them**

E. Michalova, P. Novotna, J. Schlegelova

Veterinari Medicina, 49 (2004): 79-100

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Since their discovery in 1945, tetracyclines have been used extensively in the therapy and prophylaxis of infectious diseases and as growth promoters. These wide applications have led to the equally fast spread of tetracycline resistant strains of gram-positive and gram-negative bacterial genera, including strains belonging to pathogenic as well as nonpathogenic species. Nonpathogenic bacteria could act as a reservoir of resistance determinants, which can be disseminated by horizontal transfer into pathogens. More than thirty different tetracycline resistance genes have been characterized. They encode two major

efflux of the antibiotic, and 2 – protection of ribosomes. Further mechanisms of tetracycline resistance include enzymatic inactivation of antibiotic, permeability barriers, mutations or multidrug transporter systems. Effective horizontal spread is favoured by the location of tetracycline resistance genes on mobile genetic elements such as plasmids and transposons. Their exchange, enhanced by the use of tetracyclines, is observed between bacteria of the same or different species and genera as well. Thus, questions of reevaluating and global reducing of tetracyclines in human and animal healthcare and food production are extensively discussed.

**Keywords:**

tetracycline resistance; *tet* genes; efflux pump; ribosomal protection; transposon; plasmid

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