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► **To cite this version:**

P.A.M. Guinée, W.J. van Leeuwen. PHAGE TYPE AND ANTIBIOGRAM OF CALF-VIRULENT SALMONELLA STRAINS IN THE NETHERLANDS. *Annales de Recherches Vétérinaires*, 1983, 14 (4), pp.420-421. hal-00901444

**HAL Id: hal-00901444**

**<https://hal.science/hal-00901444>**

Submitted on 11 May 2020

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## PHAGE TYPE AND ANTIBIOGRAM OF CALF-VIRULENT SALMONELLA STRAINS IN THE NETHERLANDS

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As an introduction to the paper «Epidemiology of Salmonellosis in calves in The Netherlands», a summary of the work at the National Salmonella Center on the increased prevalence of highly virulent and multiply resistant *S. dublin* and *S. typhimurium* strains in calves is presented. Part of this work has already been presented by Dr. van Leeuwen (1981). The *S. typhimurium* strains were phage typed with the Bilthoven system (Guinée *et al.*, 1974). A limited number of strains was also phage typed with the Colindale system at the Public Health Laboratory Service in London. The results are summarized in table 1. The strains desi-

gnated Atypically Reacting Strain are encountered only sporadically and have therefore not been assigned a symbol in the system. The prevalence of the various types is shown in figure 1.

The *S. typhimurium* strains isolated from 1972 belonged to phage type 201 and were resistant to tetracycline (Tc), chloramphenicol (Cm), kanamycin (Km), ampicillin (Ap) and streptomycin (Sm). Strains of this type have now nearly disappeared and been replaced by multiply resistant *S. dublin* strains in 1975 and by *S. typhimurium* phage

Table 1.

Bilthoven phage type	Resistance	Colindale phage type	Also found in
201	Tc Cm Km Ap Sm	207	W. Germany <sup>1</sup> Belgium <sup>2</sup>
193	Tc Cm Km Ap Sm Tp ...	193	W. Germany <sup>3</sup> U.K. <sup>4</sup> Belgium <sup>4</sup>
202	Tc Cm Km (Ap Sm) Tp	204c	U.K.
ARS	Tc ... ..	204a	U.K.
ARS	... ..Sm Tp	170	U.K.
ARS	Tc ... ..	49	U.K.

1. Helmuth R., 1981.
2. Anderson E.S., 1977.
3. Kempf G., personal communication.
4. Rowe B., 1979.

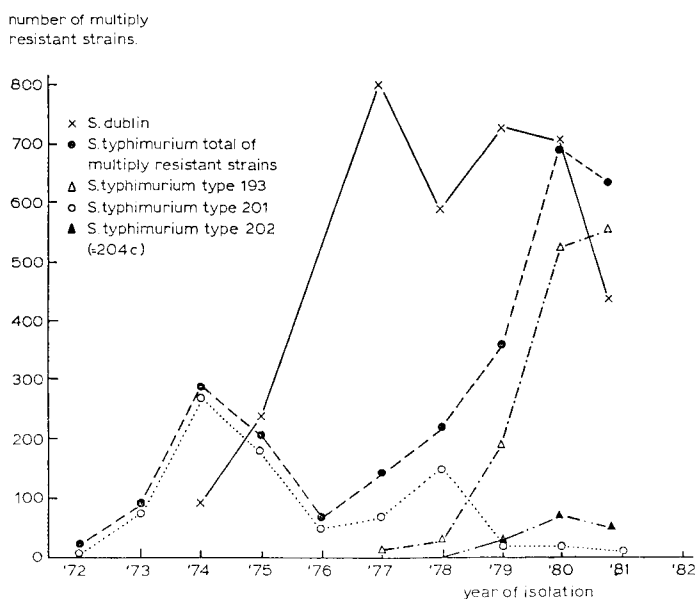


Fig. 1. — Number of multiply resistant *S. typhimurium* and *S. dublin* strains of bovine origin.

type 193 strains in 1977 and subsequent years. Since 1979, phage type 202 strains have been found. These strains are also resistant to trimethoprim (Tp). The reason for the decrease of the Tp-sensitive phage type 201 strains and the increase of the Tp-resistant type 193 and 202 strains might

be increased use of Tp for therapeutic treatment of diseased calves.

*EEC seminar on gastro-intestinal diseases in the young pig and calf* 1-3 December 1982, INRA CRZV de Theix 63110 Beaumont, France.

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