

## THE ACTIVITY OF STREPTOMYCIN IN RELATION TO BACTERIAL SPORES AND THE PRESERVATION OF MILK

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A study was completed recently of the activity of penicillin against bacterial spores in milk (in press). During the first part of this work some parallel observations were made also on streptomycin. When the very limited effectiveness of the latter agent became apparent, the work was discontinued. Since the literature contains no reference to the activity of streptomycin against bacterial spores, the essential findings are briefly recorded.

The organisms, their sources, and the methods and techniques employed were as described in the report concerning penicillin. The streptomycin was the commercial product (Merck) dissolved in sterile distilled water. After the seeding of tubes of sterile (autoclaved) milk with the washed spores, the inoculated samples were heated at 95 C for 15 minutes, cooled, and 5 u per ml of streptomycin were added. The number of viable spores before heating was approximately 50,000 per ml.

The milk inoculated with *Bacillus megatherium* (4 strains tested) and treated with streptomycin remained unchanged during 3 months of storage at 30 C. The controls with no streptomycin were visibly spoiled within 10 days.

Visibly spoiled within 10 days were both test and control samples of *Bacillus laterosporus* (2 strains), *Bacillus cereus* (5 strains), *Bacillus mycoides*, *Bacillus metiens*, *Bacillus subtilis* (11 strains), *Bacillus pumilus*, *Bacillus brevis* (3 strains), *Bacillus macerans*, *Bacillus polymyxa*, *Clostridium botulinum*, and strain 3679 (anaerobe). Both test and control samples of *Bacillus alvei* spoiled in about 1 month.

Later observation revealed that 100 u per ml of streptomycin were not sufficient to prevent spoilage of milk containing as few as 100 per ml of viable spores of *C. botulinum* and of 3679 (anaerobe).

On each of 3 days, raw whole milk receiving no artificial inoculation was heated at 95 C for 15 minutes, cooled, and treated with streptomycin at the rate of 50 and 100 u per ml. The count after heating varied from 1 to 46 per ml (spores). All samples containing streptomycin visibly spoiled within 1 month under both aerobic and anaerobic cultivation (30 C); control samples spoiled in 3 days.

The foregoing observations indicate that streptomycin in ordinary concentrations has very limited activity against bacterial spores.