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Brief Communication

INTERFERENCE BETWEEN STAPHYLOCOCCUS EPIDERMIDIS (Se) AND STAPHYLOCOCCUS AUREUS (Sa) IN THE BOVINE UDDER

It has been suggested that Se might act as a protective agent against other more pathogenic bacteria i.e. Sa (*Edwards & Jones* 1966). Several authors have reported that Sa has become the major cause of mastitis after the eradication of Strept. agalactiae which indicates the presence of an interfering mechanism between different bacteria (see *Schalm et al.* 1971).

This study comprised 9 lactating, non-pregnant SRB-cows with clinically healthy udders. The cell count per ml milk from each individual udder quarter varied between 10,000 and 390,000, exceeding 100,000 in 6 quarters only.

Three cows had an Se-strain of their own in 1 quarter each. These strains and 9 other Se strains were used as interfering strains. Six different Sa strains (challenge strains) were tested against the 12 Se strains.

A low dose of Se was inoculated into 2 udder quarters of each of 6 cows and into 1 quarter of each of the 3 cows already harbouring Se. The inoculations were carried out immediately after afternoon milking with a cannula through the lateral teat wall. The reaction of the udder was followed by clinical examinations and measurements of milk yield and somatic cell- and bacterial concentrations 2—3 times weekly, from 3 to 8 times.

Five to 14 days after the first inoculations the challenge strain (Sa) was inoculated into all 4 quarters of each animal. Clinical examination and determination of bacterial content in the milk were performed at 3, 6, 9 and 16 hrs. post inoculation. These determinations were thereafter carried out daily at 1200 hrs. for at least 1 week and then 3 times a week. Milk yield and cell concentration were determined daily on the days immediately following inoculation and then 2—3 times weekly.

The cows were slaughtered 13 to 23 days after the Sa inoculation, and the udders were subjected to pathological-anatomical examination.

Table 1. Frequency of Sa infected quarters at the time of slaughter.

	Total number	Infected with Sa at the time of slaughter (number)	Infected with Sa at the time of slaughter (% of total number)
Quarters inoculated with Sa only	12	11	92
Quarters pre-inoculated/spontaneously infected with Se before inoculation of Sa	12	4	33
Quarters from which Se could be re-isolated at the time of Sa inoculation	8	1	13
Quarters from which Se could not be re-isolated at the time of Sa inoculation	4	3	75

The results obtained by inoculating a low dose of Se compared favourably with those reported by *Holmberg & Åström* (1973). However, in 1 quarter the Se strain inoculated could never be re-isolated, and in a further 3 quarters Se could not be re-isolated at the time of Sa inoculation.

The results of the Sa inoculations varied considerably. Three cows showed an acute, clinical mastitis in all 4 quarters within 48 hrs. after inoculation. Their general condition rapidly deteriorated and they all died within 4 days. Of the 12 quarters the one, in which Sa was not isolated at necropsy, was found to contain a large number of Se.

Six udder quarters (25 %) of the remaining 6 cows showed mild to strong clinical symptoms of mastitis. This reaction was evenly distributed between quarters pre-inoculated with Se and quarters only inoculated with Sa.

The cell count rose markedly in 10 out of 12 quarters (83 %) inoculated with Sa only. The already raised cell counts in quarters pre-inoculated with or harbouring Se could be seen to increase further after the Sa inoculation in 6 quarters out of 12 (50 %).

The results of isolation of Sa in the udders at the time of slaughter are presented in Table 1. As can be seen only 1 out of 8 quarters (13 %) harbouring Se at the time of Sa inoculation still contained Sa at the time of slaughter. In not more than 4 of the alltogether 12 quarters (33 %) pre-inoculated with or

spontaneously infected with Se was it possible to isolate Sa at the time of slaughter. When no interfering strain had been used 11 out of 12 quarters (92 %) inoculated with Sa remained infected.

Six of the 9 known Se strains prevented the growth of Sa in vitro. The same tendency to interfere with Sa growth in the udder was evident among both the strains that did prevent growth in vitro and those that did not.

This investigation indicates that udders harbouring Se are less prone to become infected with Sa under experimental conditions than are uninfected udders. Further work is required before the results of this experiment can be fully evaluated.

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