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Brief Communication

THE OCCURRENCE OF ANTIBODIES AGAINST STAPHYLOCOCCAL DEOXYRIBONUCLEASES IN BOVINE MILK

The deoxyribonucleases (DNases) have, to an increasing extent, been emphasized as taxonomic and pathogenic criteria with regard to Staphylococcus aureus infections (*Abramson* 1972). The frequent occurrence of antibodies against staphylococcal DNases in blood serum of various domestic animals has been reported (*Sandvik* 1974). Based upon the high frequency of clinical and subclinical udder infections caused by S. aureus (*Schmidt Madsen et al.* 1974) it seems important to study the role of staphylococcal DNases and their antibodies in relation to udder health and mastitis problems. The present work was carried out to investigate the possible existence of antibodies against staphylococcal DNases in bovine milk.

Altogether 53 milk samples from the same number of cows were examined by a so-called DNase inhibition test similar to that used earlier for the testing of blood serum (*Sandvik*). The toluidine blue deoxyribonucleic acid agar (TDA) (*Lachica et al.* 1971) was used for the demonstration of enzyme activity. The test organism used for the detection of antibodies against DNases was S. aureus NVH* 19, isolated from bovine mastitis. All the cows were at least 3 weeks after the colostrum period. A total of 6 samples of homogenized and pasteurized consumers milk from a large dairy taken during a 6 months period was also investigated.

The anti-DNase titres of the 53 randomly picked quart samples are summarized in Table 1, and it can be seen that the titres are distributed with values ranging from 0 to 1:512 with a maximum at 1:64. Included in the 53 samples were samples from each of 10 cows in 1 particular herd. In these cases the results were compared with the corresponding titres for anti-DNases in blood serum. The results are summarized in Table 2 where the ages of the individuals are also indicated.

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* The culture collection of the Department of Microbiology and Immunology, Veterinary College of Norway, Oslo.

Table 1. Anti-DNase titres of 53 randomly picked milk samples.

	Anti-DNase titres										
	0	1:1	1:2	1:4	1:8	1:16	1:32	1:64	1:128	1:256	1:512
Number of samples	3	3	4	5	7	6	5	13	2	3	2

0: No reaction with undiluted milk.

All the samples of consumers milk showed low, but positive titres in the range of 1:4 to 1:32.

The frequent occurrence of anti-DNases in bovine milk demonstrated in the present examinations emphasizes the results with blood sera of various species (*Sandvik*). Especially interesting are the corresponding titres in milk and blood serum from the same individuals. These titres were generally much higher in blood serum than in milk. However, no regularity in the relationship between the 2 corresponding titres seems to exist, as this proportion varied greatly from one individual to another. This is an interesting observation which needs further examination in order to clarify among other points, whether a local production of anti-DNases takes place in the udder during a case of mastitis.

The referred preliminary results should be seen in relation to the high frequency of bovine staphylococcal udder infections.

Table 2. Corresponding titres of anti-DNases in milk and blood serum of some cows in 1 particular herd.

Cow no.	Age years	Anti-DNase titre in serum	Anti-DNase titre in milk
1	6	1:8192	1:8
2	6	1:64	1:4
3	7½	1:8192	1:64
4	8	1:8192	1:64
5	5	1:8192	1:16
6	3	1:64	1:2
7	2	1:128	0
8	2	1:64	1:1
9	4	1:1024	1:256
10	3	1:8192	1:64

0: No reaction with undiluted milk.

Thus, the demonstration of anti-DNases may be used as a model both for the study of the ubiquitous occurrence of staphylococci and the immunological state versus clinical staphylococcal infections in the herds. As the formation of certain DNases seems to be one of the most interesting criteria for pathogenic strains of S. aureus (*Abramson*) and in addition are easy to identify enzymoserologically, these enzymes should also be of interest in the diagnosis of mastitis. The possibility of using the antigenic properties of the DNases as basis for a serological classification of S. aureus in this connection should be kept in mind. Furthermore, it would be of importance to be able to clarify the effects of these enzymes with regard to the pathogenicity of S. aureus in the udder.

In conclusion the immunological circumstances concerning staphylococcal DNases seem to be an interesting parameter in connection with bovine mastitis.

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