

## TARC Note

### **Epizootiological studies on bovine mastitis in Sri Lanka**

Bovine mastitis is regarded as one of the most prevalent diseases in many countries where the dairy industry is important. In view of the increasing importance of the establishment of control measures against bovine mastitis,<sup>5)</sup> the present study on bovine mastitis incidences with a special reference to the tropical climate in Sri Lanka was carried out.

In the present report, the epizootiological features of the incidences of bovine mastitis in Up-, Mid-, and Low countries where the climatic conditions are different each other are described. The study was also related to the problems whether there are any differences among the breeds of exotic or indigenous cattle, effect of machine milking, or bacteria involved in the bovine mastitis and their pathogenicity to mammary gland. Staphylococci and streptococci isolated from the mastitic milk samples were also examined for their drug resistance. Control measures are discussed along with the results obtained.

For the diagnosis of the bovine mastitis, modified California Mastitis Test (M-CMT) was employed throughout the study. The PL Tester of Nihon Zenyaku Co. Ltd., Fukushima, Japan (0.02% of bromothymol blue in 2.0% alkylaril-sulphonate)<sup>4)</sup> was employed by comparing with the Sri Lankian reagent (0.025% of bromocresol purple in 0.1% of Teepol).

Bacteriological examinations were carried out by referring to the procedures recommended by the International Dairy Federation (1971)<sup>1)</sup>. Drug resistant strains were examined by means of the disc method (Tri-Disc, Eiken Co. Ltd., Tokyo, Japan). The disc are penicillin(PC), streptomycin(SM), tetracycline(TC), oleandomycin(OM), leucomycin(LM), kanamycin(KM), erythromycin(EM), and chloramphenicol(CM).

In Sri Lanka, Up-, and Mid-countries are mountainous or hilly regions and are moderate

in climate compared with Dry-zone low-country where it is extremely hot all the year round and seasonally dried.

Breeds of indigenous cattle, their cross breeds, Holstein Friesian, Ayrshire, Jersey, or Short Horn in Up-, and Mid-countries while, several breeds of indigenous cattle, their cross breeds, or buffaloes are prevalently seen in Dry-zone low-country (Table 1).

In the present study, it was elucidated that the incidence of bovine mastitis was significantly higher in the Dry-zone than that in Mid-country, and the incidence in Mid-country was higher than that in Up- country. Thus, it seems that the incidence of bovine mastitis is correlated with the climatic conditions (temperatures) of the regions (Table 1).

Milking machines have been introduced into only Up-, and Mid-countries, where the bovine mastitis incidence was found to be significantly higher with machine milked cattle than those of hand milked ones as shown in the other reports<sup>2,4)</sup> (Table 1).

No significant differences in mastitis incidence were observed among the breeds of cattle and the position of the quarter in each regions.

In the Up- and Mid-countries, *Streptococcus agalactiae* was prevalently detected and isolated from the mastitic milk samples and was drug sensitive to the eight kinds of antibiotics used. While, in Dry-zone low-country, *Staphylococcus aureus* was more prevalently detected and isolated from the mastitic milk samples. Twenty-one (30.9%) out of 68 strains were drug resistant against PC (10 strains), SM (4 strains), TC (1 strain), EM (1 strain), PC-SM (1 strain), TC-CM (2 strains), PC-EM-OM-LM (1 strain), and PC-SM-OM-CM-TC (1 strain). This drug resistant situation is comparable to that in other reports<sup>3,4)</sup>.

Both of *Staphylococcus aureus* strain 28 and *Streptococcus agalactiae* strain 22, isolated from mastitic milk samples, were examined for their pathogenicity or reproducibility of bovine mastitis by *intra mammary* infusion of the live bacterial suspension containing 10<sup>8</sup> of each organism to indigenous cattle free from bacterial infection.

Table 1. Incidence of bovine mastitis in three regions of Sri Lanka

Regions (Climatic temperatures*)	Number of herds (milking method)	Mastitis incidences**		Breeds of animals
		In Animals	Udders	
Up-country (10-30°C)	3 (hand)	280/681 (41.1%)	511/2618 (19.5)	Holstein Friesian (H. F.), Ayrshire (A), Jersey (J), Short Horn (S. H.)
	1 (machine)	68/88 (77.3)	185/330 (56.1)	
Mid-country (21-32°C)	3 (hand)	39/92 (43.3)	94/363 (25.9)	H. F., A., S. H., J., Sindhi (S.)
	1 (machine)	43/54 (79.6)	123/370 (57.2)	
Low-country (dry-zone) (24-38°C)	5 (hand)	50/99 (50.0)	113/370 (30.5)	Haryana (H), Buffalo (B.) Tharpaker (T.) S., S. cross, H. cross, J. cross, A. cross, H. F. cross
Total	11 hand)	369/872 (42.3)	718/3351 (21.4)	
	2 (machine)	111/142 (78.2)	308/545 (56.5)	
	13	480/1014 (47.3)	1026/3896 (26.3)	

\* Information was obtained from Dr. M.C.L. de Alwis, Veterinary Research Institute, Peradeniya, Sri Lanka.

\*\* Figures indicate No. of mastitis incidence/total No. examined.

The inoculated cattle expressed severe acute symptoms such as high fever after 4 hrs of inoculation, loss of appetite, depression, swelling of the inoculated quarters, and produced clinical mastitis with a greatly reduced milk yield and purulent milk secretion.

On the basis of the present study, control measures against bovine mastitis were suggested: thorough disinfection of the quarters before and after the milking (Hibitane, I.C.I., U.K.), teat dipping, and improvement of machine milking operation by hygienic or mechanical regulations. Effective drugs were introduced to prevent the infection of mammary gland. Drugs employed for this purpose were penicillin and streptomycin combination (Masticillin-C, Bayer, Germany, and Streptopen Glaxo, U.K.) and tetracycline (Teramycin, Pfizer, India). Significant reduction of mastitis incidences was observed after the introduction of the above control measures to the dairy herds used in the present study.

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Takao FUJIKURA\* *Tropical Agriculture  
Research Center, Japan*

Thamara RUPASINGHE *Veterinary Research  
Institute, Peradeniya, Sri Lanka*

Arumugaswamy RAMAKRISHNASWANY  
*Veterinary Research Institute, Peradeniya  
Sri Lanka*

Ponnia KULASEGARAM *Veterinary Research  
Institute Peradeniya Sri Lanka*

Gamini Lal SANTIYAGO *Government Vet-*

*erinary Surgeon, Minneriya, Sri Lanka*  
Pain PRABAKARAN *Livestock Research  
Station, Trincomalee, Sri Lanka*

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\* Presently, National Institute of Animal Health,  
Japan (Now staying: Veterinary Public Health  
Unit, Communicable Disease Division, WHO,  
CH-1211, Geneva 27 Suisse)