A SURVEY OF SHEEP MASTITIS IN SOUTHERN BRAZIL

UM LEVANTAMENTO DE MASTITE OVINA NO SUL DO BRASIL

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SUMMARY

Ovine mastitis causes varying economic losses in all countries where sheep are kept. A survey of 3128 breeding ewes in 22 farms in two areas with different management practices in Southern Brazil showed that the average prevalence of subclinical and chronic mastitis was 14.1% of ewes with at least one affected gland. From those, 4.49% were also bacteriologically positive. The prevalence in individual farms varied from 0 to 37% of ewes with clinical abnormalities of the udder. The overall prevalence was greater in Area II, where meat breeds predominate and animals are housed at night. It is concluded that subclinical and chronic mastitis is unlikely to be an economic problem in Area I, where wool production is the objective of the sheep industry. However, in individual farms with high prevalence of the disease lamb survival and development may be affected. In Area II, mastitis is more likely to be a problem because of the higher prevalence found in that area.

Key words: sheep, ewes, mastitis, lambs, Brazil

RESUMO

Mastite ovina causa variáveis problemas econômicos em todos os países onde existem ovelhas. Um levantamento em 3128 ovelhas em lactação em 22 propriedades situadas em duas áreas com diferentes sistemas de manejo no sul do Brasil revelou que a prevalência média de mastite subclínica e crônica é de 14,1% de ovelhas com pelo menos uma glândula mamária afetada. Dentre estas, 4,49% foram também bacteriológicamente positivas. A prevalência em propriedades individuais variou de 0 a 37% de ovelhas com anomalias clínicas no úbere. A prevalência média foi maior na Área II, onde predominam raças de carne e os animais são presos à noite. Conclui-se que mastite crônica ou subclínica provavelmente não é um problema econômico na Área I, onde o objetivo é a produção de lã. Entretanto, em propriedades individuais onde a prevalência é elevada, a sobrevivência e desenvolvimento de cordeiros pode ser afetada. Na Área II, mastite pode ser um problema econômico, devido à maior prevalência detectada.

Palavras-chave: ovinos, ovelha, mastite, cordeiros, Brasil.

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INTRODUCTION

The first mention of mastitis as a possible cause of economic loss to the sheep industry in Southern Brazil occurred in the mid-sixties when WILLIAMS (1966), during a survey of lamb mortality, considered it to be a possible cause of loss. The same view was expressed by SELAIVE (1980) in an advisory leaflet about ewe culling. The present incidence of mastitis in the sheep-raising areas of Southern Brazil is not known. There have been reports of the occurrence of acute staphylococcal mastitis (FERNANDES & CARDOSO, 1985) and of subclinical mastitis in goats (SCHMIDT et al., 1992). It seems that the latter has some importance, since GUIMARÃES et al. (1989) considered it worthwhile to study different parameters for its diagnosis, and concluded that the California Mastitis Test is effective in this species too.

The etiology of sheep mastitis varies according to the objective of the enterprise: in milking sheep, ***Staphylococcus aureus*** is the most frequent etiologic agent. In meat breeds, ***Pasteurella haemolytica*** becomes as important as ***Staph aureus*** (JONES, 1991). This is so because ***P. haemolytica*** is transmitted by the act of sucking. Therefore, milking ewes from which lambs are weaned early, have a much lower incidence of these bacteria (JONES, 1992; unpublished data).

There is little doubt that mastitis can lead to reduced lamb growth (JONES, 1991; KALINOWSKA, 1990; FTHENAKIS & JONES, 1990; JONES, 1993).

MATERIAL AND METHODS

The two areas where the study was undertaken have quite different management practices. In area I (Rio Grande do Sul State, near the towns of Bagé and Dom Pedrito, and bordering Uruguay, the farm area is extensive and flocks are large. Flocks up to a thousand breeding ewes are common. Sheep are kept under range conditions, grazing together with cattle at a stocking rate o fabout 1 - 1.5 sheep/hectare. The total sheep population is estimated to be 9 million, with a production of 18.7 thousand tonnes of wool (RODRIGUES, 1991). The most numerous breed is the Corriedale, followed by Romney Marsh. In this area, the objective of the industry is wool production.

In area II (Santa Catarina State, near the towns of Lages and Canoinhas), the sheep industry is of quite recent origin. This area is located on a plateau about 900 metres above sea level, where winters are quite harsh. The soil is rocky and few areas are adequate for agriculture. Flocks and farms are much smaller, with 100 ewes being considered a large flock. Sheep are housed during the night to avoid predators, and usually fed a little supplementary food during winter. They are in general crossbreds. Recently, "meat" breeds like Suffolks and Texels are gaining in popularity. The objective of the industry is to produce meat and breeding stock for a growing demand.

The survey was conducted in November and December, 1992, beginning in area I. In the first two farms (A and B), we asked for the lambs and ewes to be separated from each other to facilitate milk sampling. This led to the animals being separated on the day before sampling. After that, we decided to keep lambs and ewes together, having found that the gathering of the flock seemed to stop the lambs sucking for enough time to allow milk collection.

The mammary gland was examined both by inspection and palpation. Approximately 2ml of milk from each gland was collected into the plastic tray commonly used for the California Mastitis Test (CMT) in cows. A similar volume of reagent (CMT - Fatec, a commercially available kit) was then added to the milk, agitated by rotating the tray for about 20 seconds and examined. If the reaction was positive (+ or more according to the kit instructions) milk was collected aseptically from both glands for bacteriological examination. Samples were inoculated in Columbia blood agar (5% sheep blood) and incubated aerobically for 18 hours at 37°C. Any resulting bacterial growth was tentatively identified by colonial and microscopic morphology. In the case of ***Staphylococcus sp.***, slide coagulase test was also performed by using rabbit plasma. If ***Pasteurella sp.*** was suspected, oxidase and catalase tests were performed. All isolates were kept on Columbia blood agar slopes and had the identification confirmed at the Department of Animal Health, Royal Veterinary College, London, UK. The identification of staphylococci was done using the API-Staph kit. Gram-negative bacteria were identified using the API-20 system. Gram-positive bacteria other than staphylococci were identified by colony and microscopic morphology.

RESULTS

Twenty two farms were sampled. These had an estimated population of 3128 breeding ewes, with farms ranging from seven to a thousand breeding ewes. Samples were obtained from 645 ewes,

representing 20.6% of the population. There were 91 (14.1%) ewes with at least one gland positive to the CMT, and from these, 29 (4.49%) were also bacteriologically positive. The bacterial species found and the clinical signs observed are shown in tables I an II. There was one case of acute mastitis, from which ***Staphylococcus aureus*** was isolated.

DISCUSSION

On the two farms (A and B) where the lambs were kept apart from their mothers overnight, there was a high number of CMT positive samples, possibly due to milk retention causing an inflammatory response. Coagulase negative ***Staphylococcus sp.*** was responsible for most cases of subclinical mastitis. WATKINS et al. (1991), in a survey in Southern England, found that streptococci were slightly more prevalent (42% compared with 33% of coagulase negative staphylococci). In Australia, WATSON et al. (1990) found that ***Staphylococcus aureus*** was responsible for 40% of all intramammary infections. The overall prevalence was lower than that reported in other parts of the world. The surveys quoted previously (WATKINS et al. 1991; WATSON et al. 1990) found respectively that 11.7 % and 14% of the ewes had an intramammary infection. In Table II it can be seen that 20% of the clinical detectable abnormalities are granulomatous lesions in the mammary tissue and chronic mastitis. If we consider them to be an outcome of previous acute mastitis, then mastitis may have some importance on some farms. In fact, there is anedoctal evidence of its occurrence: local farm workers say that some ewes die of "snakebite" in the ventral region, describing signs similar to those of acute mastitis. Unfortunately, it was impossible to obtain records of its frequency. The case of acute mastitis was observed by chance. This type of mastitis was not the object of this work.

With the exception of one case in farm A, the granulomatous lesions found in this survey are not compatible with those of Maedi-Visna. GUIGUEN et al. (1992) described a "hard udder" type of lesion, involving most of the gland tissue. This was not

Table I. Bacterial species isolated

Bacterial species	Farm																								
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	Total	%
Staphylococcus sp. coagulase (-)ve	2	6	2	1		1	1	1							1			1					16	59.3
Staphylococcus sp. coagulase (+)ve		1		1																			2	7.41
Pasteurella haemolytica						1																	1	3.7
Escherichia coli			2																				2	7.41
Streptococcus sp.										1						1							2	7.41
Micrococcus sp.			1																				1	3.7
Corynebacterium sp.		1																					1	3.7
Unidentified		2																					2	7.41
Total*	2	10	5	2	0	2	1	1	0	1	0	0	0	0	1	1	0	1	0	0	0	0	27	100
	Area I					Area II																			

* Number of positive glands

Table II. Clinical abnormalities detected

Type of lesion	Farm																						
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	Total
Lumps/chronic mastitis	4	4	2						3		1		1			3							20
Subcutaneous cysts	2	2															1					2	7
Amputated/blocked teat	2	1		1																			4
Abcess	1																						1
Diffuse hardness	1							1										1					3
Total +	10	7	2	1	0	0	0	1	3	0	1	0	1	2	0	3	1	1	0	0	0	2	35
%	14	37	4.6	1	0	0	0	-	17	0	3.7	0	9	15	0	23	7.6	13	0	0	0	15	100
	Area I					Area II																	

\+ number of ewes

observed, but it does not mean that Maedi-Visna is not present in the population.

Subclinical mastitis is probably not an economic problem in area I, due to the characteristics of the enterprise (wool production). Even so, some farms, like farm B, have a higher prevalence both of subclinical mastitis and clinically detectable lesions. There are no data, however, how this could affect wool production, both by the affected ewe and its lamb.

In area II, we came across at least three farms (P, R and V) in which the disease could affect meat production by reducing weight gain in the lambs (FTHENAKIS & JONES, 1990). Farm P is a ram breeding farm, where the nutritional plane of the ewes was much above average. In farm C, some animals belonged to a stud, and were also on a high plane of nutrition. It is possible that, by increasing milk production, a higher nutritional level could affect the incidence of subclinical mastitis, by putting more stress on the mammary gland.

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REFERENCES

FERNANDES, J.C.T., CARDOSO, M.R.I. Mamite Ovina causada por *Staphylococcus aureus*. **Arq Fac Vet UFRGS**, v. 13, p. 71-74, 1985.

FTHENAKIS, G.G., JONES, J.E.T. The effect of experimentally induced subclinical mastitis on milk yield of ewes and on the growth of lambs. **Br Vet J**, v. 146, p. 43-49, 1990.

GUIGUEN, F., LERONDELLE, C., OUZROUT, R. L'expression des lentivirus au moment de l'agnelage modifie la formule leucocytaire du lait des brebis multipares. **Ann Rech Vet**, v. 23, p. 189-197, 1992.

GUIMARÃES, M.P.M.P., CLEMENT, W.T., SANTOS, E.C. et al. Caracterização de alguns componentes celulares e físico-químicos do leite para diagnóstico da mamite caprina. **Arq Bras Med Vet Zoot**, v. 41, n. 2, p. 129-142, 1989.

JONES, J.E.T. Mastitis in sheep. In: J.B. Owen and R.F.E. Axford **Breeding for disease resistance in farm animals**. Bangor: CAB International, 1991, p. 412-423.

JONES, J.E.T. Mastitis in ewes, A.D.R.A.S. News sheet 29, p. 1-7, 1993.

KALINOWSKA, C. The effect of mastitis in Merino ewes on body weight and mortality rate of lambs. **Roczniki Naukowe Zootechniki**, v. 17, p. 137-145, 1990.

RODRIGUES, D.V.C. **Ovelha - uma riqueza gaúcha em potencial**, leaflet, URCAMP, 1992.

SCHMIDT, V., GOMES, M.J.T., AROSI, A., et al. Agentes bacterianos como cause de mamite subclinica em caprinos no Rio Grande do Sul, Brasil. In: XI Congr. Est. Med. Vet., Gramado, RS, Brazil, 1992.

SELAIVE, A.B. **Considerações sobre descarte de ovinos.** Boletim Técnico EMBRAPA/UEPAE Bagé, 1980.

WATKINS, G.H., BURRIEL, A.R., JONES, J.E.T. A field investigation of subclinical mastitis in sheep in southern England. **Br Vet J**, v. 147, p. 413-420, 1991.

WATSON, D.L., FRANKLIN, N.A., DAVIES, H.I., et al. Survey of intramammary infections in ewes on the new England tableland off New South Wales. **Aust Vet J**, v. 67, n. 1, 1990.

WILLIAMS, B.M. Levantamento das causas de mortes de cordeiros no RS. **Arq. IPVDF**, v. 3, n., p. 23-26, 1966.