

# PROTOTECHA ZOPFII INTRAMAMMARY INFECTIONS CONTROL IN A HIGH PREVALENCE HERD: PRELIMINARY RESULTS

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## INTRODUCTION

Protothecal bovine mastitis is a relatively rare pathology although reported since 50 years (1).

Diagnostic laboratories of Istituto Zooprofilattico Sperimentale of Brescia (one of the most important Italian dairy area) perform, on average, 4000 milk bacteriological analysis from infected quarters in a year.

Data collected since 2002 show a percentage of protothecal infection ranging from 0,7 to 3,3 % (Table 1). In a commercial dairy herd of 230 lactating cows with high milk yield (more than 10 tons/cow/year), persistently high bulk tank milk somatic cell counts (BTMSCC) and total bacterial counts (BTMTBC) were reported, caused by a high prevalence of protothecal intramammary infections. Despite this pathogen is considered mostly an environmental micro-organism (2), in this case, a typical approach to contagious mastitis was applied, except for therapeutic protocols because of their known ineffectiveness on this kind of infection (3).

Table 2 - BTMTBC and % of infected animals

Months	Lactating cows	CFU/ml X 1000	New infections	Total of infected animals	
				n	%
04/05/06-2005	233	50-38-79			
07-2005	188	101			
08-2005	200	128			
09-2005	226	255		44	19,5
10-2005	222	139			
11-2005	194	193	11	33	17,1
12-2005	190	65	5	26	13,7
02-2006	198	36	4	31	15,6
04-2006	209	37	1	25	11,9
06-2006	208	55	0	19	9,1
07-2006	195	64	0	13	6,5
08-2006	200	51			

## RESULTS AND DISCUSSION

Data in table 2 show a decrease of protothecal intramammary infections in healthy cows group. BTMTBC considerably decreased in December, under legal threshold parameter, following 20 cows culling.

A progressive decrease in the number of infected animals is typical of eradication protocols for contagious mastitis control, where false negative animals should be present in first controls. In these preliminary observations protothecal infections seem to behave like a contagious pathogen, with infected animals as a major source of infection.

Culling of infected animals led to a quickly decrease in BTMTBC, evidencing a possible relation with the prevalence of Protothecal infection in the herd. Separation of infected animals and their progressive culling will probably lead to further BTMTBC improvement.



Drinking) trough: risk of contamination

Table 1 - Milk bacteriological analysis from 2002 to 2006

Genus	2002		2003		2004		2005		09-2006	
	N	%	N	%	N	%	N	%	N	%
Negative samples	1839	38.0°	965	26.6°	778	25.2°	732	20.0°	404	15.4°
Polimicrobism	1150	23.7°	827	22.8°	687	22.2°	1020	27.8°	750	28.5°
Positive samples	1856	38.3°	1841	50.6°	1624	52.6°	1914	52.2°	1474	56.1°
Contagious bacteria ( <i>Staph. aureus</i> , <i>S. agalactiae</i> )	467	25.2°°	492	26.7°°	487	30.0°°	534	27.9°°	336	22.9°°
Gram negative (*)	245	13.2°°	216	11.7°°	228	14.0°°	228	11.9°°	266	18.0°°
<i>S. uberis</i>	83	4.5°°	96	5.3°°	188	11.6°°	144	7.5°°	103	7.0°°
Prototheca	17	0.9°°	20	1.1°°	26	1.6°°	14	0.7°°	49	3.3°°
Minor pathogens	1044	56.3°°	1017	55.2°°	695	42.8°°	994	51.9°°	720	48.8°°
TOTAL	4845		3633		3089		3666		2628	

\* Coli, Klebsiella, Serratia, Proteus e Citrobacter strains  
° percentage on total samples  
°° percentage on positive samples

## MATERIALS AND METHODS

In a commercial dairy herd with high milk yield, BTMTBC (Table 2) quickly increased from 58.000 CFU/ml to values between 101.000 CFU/ml and 193.000 CFU/ml during a period from July to November, rising above the legal EU threshold value (100.000 CFU/ml). Milking routine and milking parlour cleaning procedures did not show any problem so that no changes were applied.

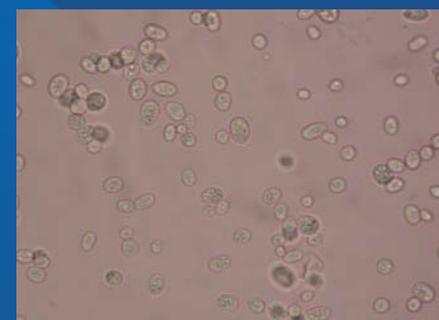
Bacteriological examination on 30 milk samples from cows with clinical mastitis or high SCC showed a high prevalence of protothecal infections (50%) so the hypothesis that this pathogen was related to high bacterial count was taken into consideration. Therefore milk samples were taken from all the lactating cows and prevalence of protothecal positive samples was estimated to be 19,5% (44 positive on 226 cows). Positive cows were separated from healthy ones and milked last.

Healthy cows were sampled periodically to find out false negative animals and evaluate if separation, in addition to the routinely hygienic measures, should be enough to control protothecal diffusion. The effect of protothecal infections on total bacterial count (139.000 UFC/ml) was tested evaluating infected cow's group BTMTBC (average 1.027.000 UFC/ml) and non infected group BTMTBC (average 21.000 UFC/ml). Another aim of the study was to verify, following the culling of positive cows, the eventual decrease in BTMTBC.

Isolation of *Prototheca zopfii* on PIM (prototheca isolation medium)



*Prototheca zopfii*: LM observation



## References

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3. McDonald J.S. et al (1984) Antimicrobial susceptibility of *Prototheca zopfii* isolated from bovine intramammary infections. J. Am. Vet. Res, 45: 1079-1080

