

# Field trial in Northern Italy to evaluate the efficacy of two different therapies against acute clinical mastitis in dairy cows



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## Introduction

Mastitis is the most common and most costly disease afflicting dairy cattle. In herds without an effective mastitis control program, about 40% of the cows are infected in an average of two quarters. Infectious mastitis may be caused by microbial organisms that result in clinical signs characterized by inflammation that disrupts normal functions (reduction in milk yield, changes in milk composition) and in systemic signs (fever, depression, shivering, loss of appetite and loss of weight). Acute mastitis caused by coliform bacteria endangers the cow's life and requires the immediate attention of a veterinarian. Treatment of clinical mastitis limits the illness's duration and the possibility of the spread of the disease. The aim of this study was to investigate and to compare the efficacy of two different therapies against acute clinical mastitis in dairy cows.

## Materials and Methods

A multi-centric, controlled and randomized trial was carried out on 155 enrolled animals for 14 days.



### Inclusion criteria

- Acute: sickness with fever for not longer than 2 days
- Fever: body temperature of >39.6 C
- Pronounced morbidity
- Clinical mastitis, affecting at least one quarter (local inflammation, altered milk)



Two treatment groups were created:

Group 1 Baytril, n = 76  
5 mg/kg b.w. of Enrofloxacin (Baytril® 10% inj. solution) intravenously (5 ml/100 kg b.w.) for 3 consecutive days

Group 2 Mamyzin/Cobactan LC, n = 79  
1 syringe of Cobactan® LC (each 8 gram syringe contains 75 mg of Cequinome)/mastitic quarter three times every 12 hours and one vial Mamyzin® (equivalent to 10 grams of Penethamate)/head intramuscularly for 3 consecutive days.

The animals enrolled in the trial treatment groups received a daily physical examination of the udder on days 1 (enrolment day and first day of treatment), 2, 3, 5, 7 and 14. Then, rectal temperature was measured, the udder secretions were evaluated through visual inspection (scored from 1 [normal] to 4 [severely altered]), and general symptoms were assessed [scored from 0 [normal] to 4 [severe morbidity]]. Sterile samples of milk were collected from all cows on days 1 (immediately before starting treatment), 5, 7 and 14 and were cultured to reveal the presence of pathogens. Further, the effect of treatment on bacteriological cure, milk yield and somatic cell counts from infected cows was examined. Incidence of clinical mastitis (swelling, firmness, pain) was examined as well (total score from 3 [normal] to 12 [severe mastitis]).

## Results and Discussion

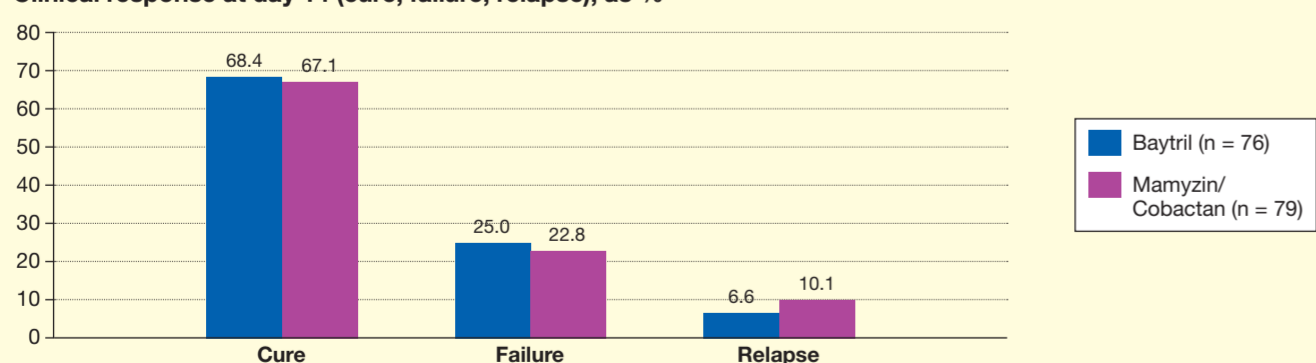
### Clinical response broken down according to milk microbiology of the affected quarters on the day of inclusion

		Inclusion (n =) based on clinical criteria														
		76						79								
		No growth	<i>E. coli</i>	<i>S. uberis</i>	<i>S. agalactiae</i>	other streptococci	other enterococci	No growth	<i>E. coli</i>	<i>S. uberis</i>	<i>S. agalactiae</i>	other streptococci	other enterococci	<i>Bacillus spp.</i>		
		(N)	(Ec)	(Su)	(Sd)	(Oss)	(Cns)	(N)	(Ec)	(Su)	(Sd)	(Oss)	(Cns)	(Bc)	n =	n =
Cure	Clinical cure at day 7 and 14	52	24	10	7	5	6	16	6	14	2	12	3	3	53	
Failure	Clinical failure at day 7	19	4	1	7		7	7	2	4	2				3*	18
Relapse	Clinical cure at day 7 but relapse at day 14	5	1	1	2		1			7		1				8
		71											79			
		Baytril						Mamyzin/Cobactan LC					ALL			

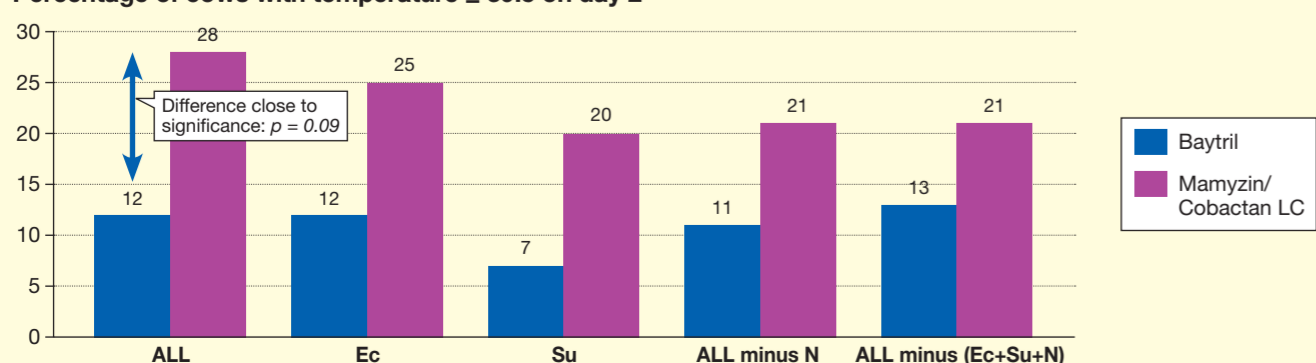
\* From those 3 cows, one died

- The most frequently isolated microorganisms were *Str. uberis* (31/155, 20%) and *E. coli* (20/155, 13%).
- Both therapies resulted in a significant reduction ( $p < 0.0001$ ) in microbiologically infected quarters, i.e., from 100% to 7.69% (4/52) with Baytril and to 7.14% (4/56) with Mamyzin/Cobactan LC.

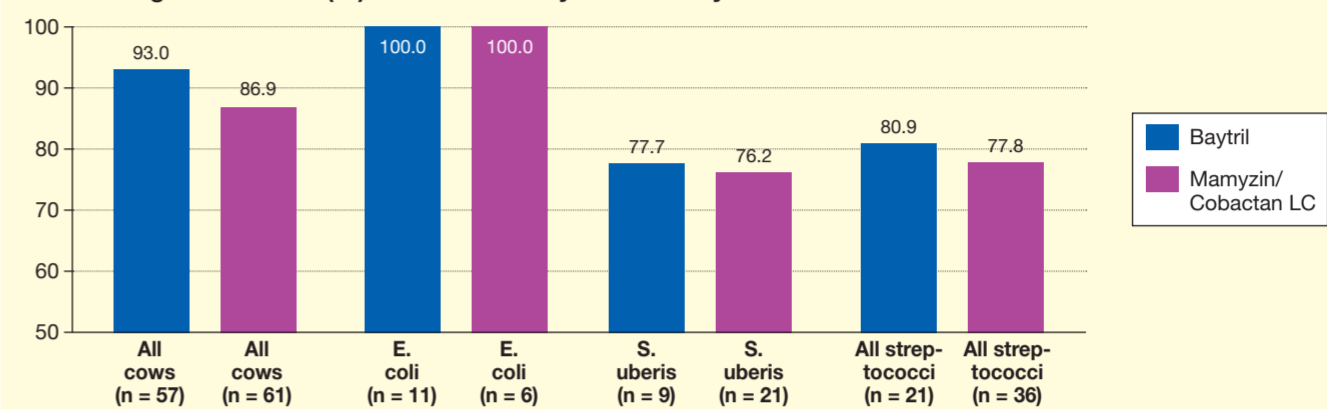
### Clinical response at day 14 (cure, failure, relapse), as %



### Percentage of cows with temperature $\geq 39.5$ on day 2

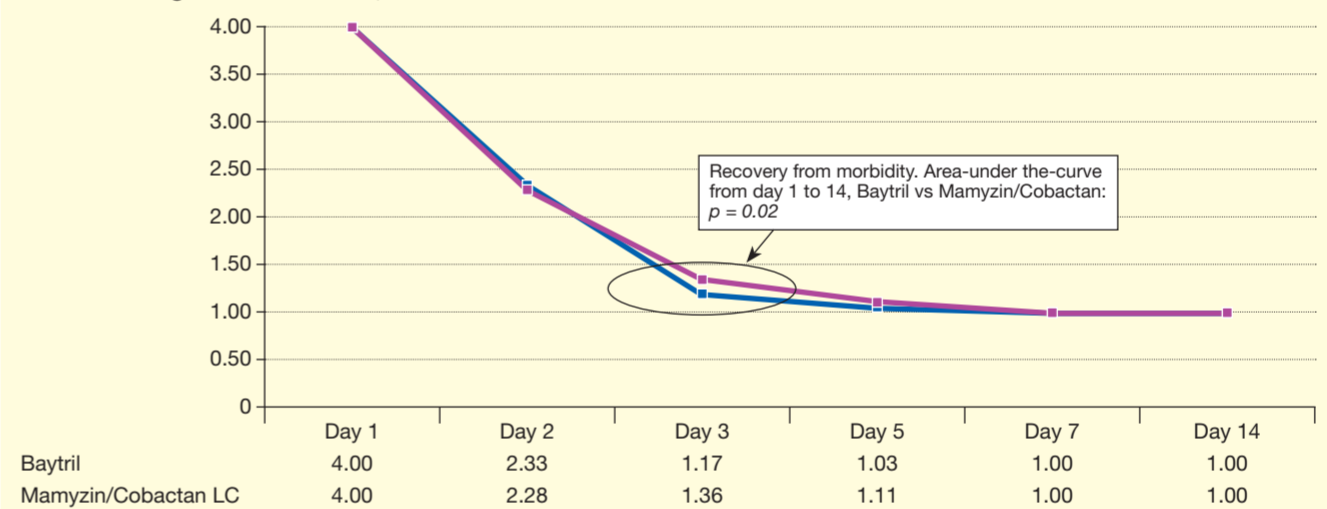


### Microbiological cure rate (%) in cows clinically cured at day 7

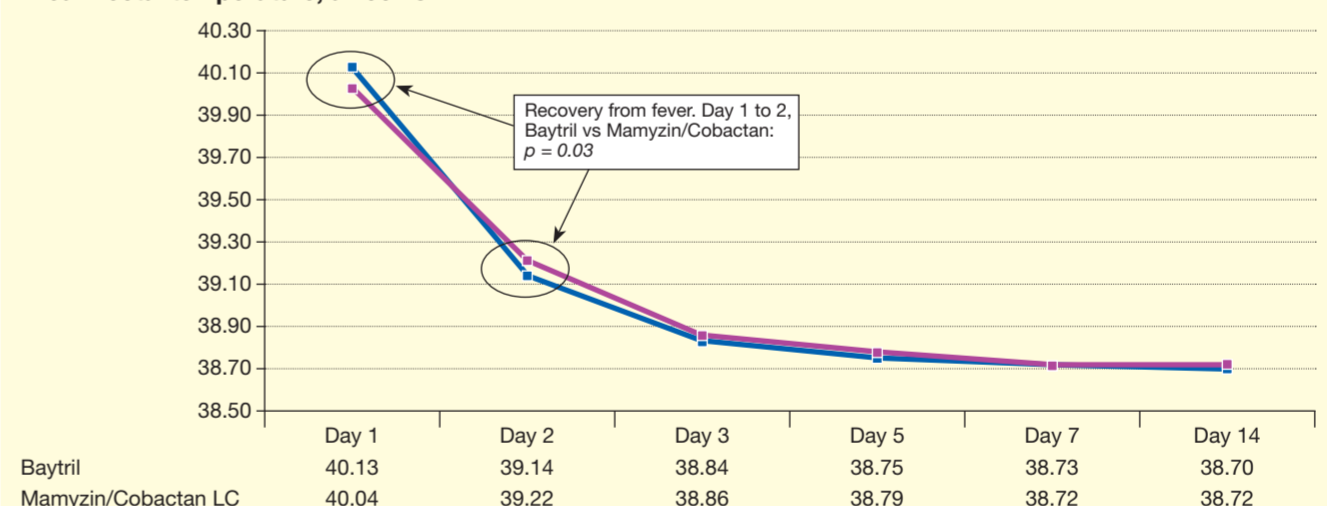


- There was a full microbiological cure for all *E. coli* cases in both groups. For acute mastitis caused by *Str. uberis*, *Str. dysgalactiae* or other streptococci the microbiological cure was lower compared to those caused by *E. coli* but with similar cure rates for both treatment regimens.
- Cows with acute mastitis and treated with Baytril recovered sooner from fever ( $p = 0.003$ ) and generalised disease symptoms ( $p = 0.02$ ) than those treated with Mamyzin/Cobactan LC. Post-treatment recovery of milk yield was likely better ( $p = 0.06$ ) in the Baytril treated cows as well. As to the other parameters, recovery was similar for both treatment regimens.
- The efficacy of the two protocols was also demonstrated by the important decrease in somatic cell number in both treatment groups: from  $10^{6.75}$  to  $10^{6.16}$  for Baytril and from  $10^{6.74}$  to  $10^{6.34}$  for Mamyzin/Cobactan LC.
- Irrespective of the causative organism, intravenous Baytril treatment cures acute mastitis more rapidly (fever, morbidity, milk yield) than the Mamyzin/Cobactan L combination and also results in a reduction in both laboratory testing fees and in the milk withdrawal period (4 days vs. 6 days).

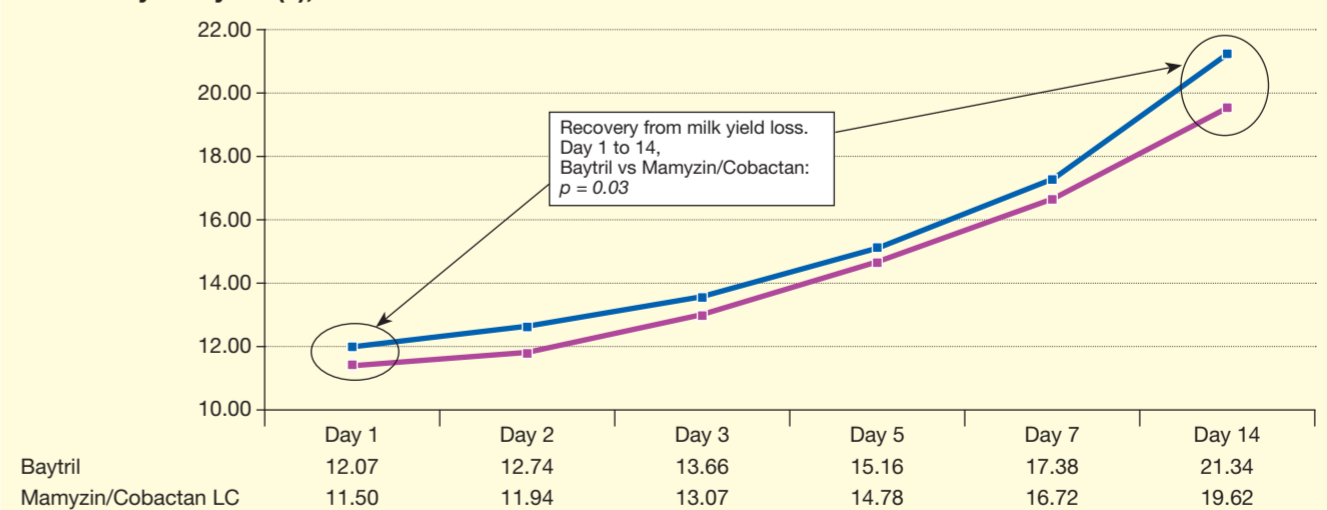
### Mean score general condition, all cows



### Mean rectal temperature, all cows



### Mean daily milk yield (L), all cows



### Mean somatic cell count ( $\times 10^3$ ), all cows

