

ON-FARM CULTURE: CHARACTERISTICS OF THE TEST

Martín Pol¹, Carla Bearzi², Julia Maito¹, Javier Chaves¹

¹Lactodiagnóstico Sur, Olivos, Buenos Aires, Argentina.

²La Polvorilla Dairy Farm, Castelli, Buenos Aires, Argentina.

OBJECTIVE

The objectives of this study were to describe the effect of using an on-farm culture system on treatment economics, to evaluate the characteristics of the test compared to conventional culture, and to calculate bacteriological cure rates in treated and non-treated quarters.



MATERIALS AND METHODS

Study was performed in a herd of 550 cows. Mild to moderate clinical mastitis were enrolled in the study by a research veterinarian, who was full-time present at the parlor during milking time. Duplicate milk samples were obtained from clinical quarters. One sample was on-farm cultured using a bi-plate (Biplaca CET®, Lactodiagnóstico Sur, Olivos, Buenos Aires) at the end of the milking by research veterinarian. The bi-plate contains selective media that allows growth of Gram + bacteria on one half of the plate, while Gram – bacteria grow on the other half of the plate. Both samples were kept frozen (-20C) and weekly submitted to the laboratory for culture with standard technique (NMC). Intramammary infection in a quarter was defined as isolation of one or two bacterial pathogen species from one quarter milk sample. Bacteriological cure of the quarter was assessed by duplicate sampling at 14±3 and 21±3 days post-enrollment. A bacteriological cure within the quarter was defined as presence of one or two organisms in the enrollment milk sample, and the absence of the same specified microorganism(s) in both the 14 and 21-day milk samples. Antimicrobial treatments were administered 24 h after diagnosis based on culture results. Milk from cases that did not receive antimicrobials was discarded until returned to normal. Days in hospital and antimicrobial usage were recorded. Clinical mastitis severity was evaluated at onset of the case. Characteristics of on-farm culture method were studied using conventional laboratory results as gold standard.

RESULTS AND DISCUSSION

A total of 81 cows (189 quarters) were enrolled in the study. Clinical cases occurred in 12% of lactation 1 animals, 10% of lactation 2 animals, 15% of lactation 3 animals, and 23% of lactation >4 animals. Most clinical cases occurred in animals with few days in milk (DIM): 46% of clinical cases occurred before 60 DIM. Samples cultured in the laboratory resulted in a majority of samples (58%) with no growth while *Corynebacterium bovis* (13%), coliforms (8%), and coagulase-negative staphylococci (6%), where the most prevalent pathogens. Severity classification resulted in 66% of mild (no quarter inflammation) mastitis, and 32% of moderate (quarter inflammation) mastitis. To evaluate test characteristics, 168 samples were available (Table 1). Using the on-farm culture method, the field veterinarian was able to detect 73% of pathogens that needed antimicrobial treatment (sensitivity). More than 80% of pathogens that did not need antimicrobial treatment (specificity) were detected at the farm. Cure rates did not differ among treated (87%) and non treated (77%) cases. Economics of the method were studied using partial budget (Table 2). For calculations, milk yield was estimated in 20 L/cow/day, milk price was U\$S 0.30/liter, mild cases treatment cost was U\$S 6, moderate cases treatment cost was U\$S 37. Cows that received antimicrobials spent 7.8 d in hospital, while non-treated animals spent 3.7 days in hospital. Bi-plate cost was U\$S 4. Incubator, fridge and labor cost were considered.

Table 1. Number of clinical mastitis cases classified as Gram + or Gram - / No Growth by laboratory (gold standard) and by on-farm culture method.

		Laboratory (Gold Standard)	
		Gram +	Gram - No Growth
On-Farm Culture	Gram +	32	22
	Gram- No growth	12	100



Table 2. Partial budget of on-farm culture method for 189 cases during 1 month (37% of all cultured cases were treated). Currency is expressed in American dollars.

	Only Gram + treated
Extra income (more salable milk)	\$ 2,526
Cost Reduction (less antimicrobials)	\$ 1,880
Income Subtotal	\$ 4,406
Income reduction	\$ -
Extra Costs (incubator+fridge+labor+plates)	\$ 1,064
Cost subtotal	\$ 1,064
Net Income	\$ 3,342