

## Don't Let Good Milk Go to Waste!



Chicago, USA 1933

The recent recession which began in 2008 has negatively impacted the global dairy industry. Lower milk prices and higher feed prices make it difficult to profitably produce milk. Dairy processors must contend with competitive retail prices, higher energy costs, and tightened credit markets. Dairy farms have gone out of business and dairy exports have fallen.

While efforts to increase milk prices, including culling cows and government assistance, have helped, dairy processors face additional milk procurement challenges that impact their production and profitability requirements.

One solution that can help the dairy farm and the milk processor alike:  
Charm<sup>®</sup> ROSA<sup>®</sup> (Rapid One Step Assay) Tests. Why?



Two Save Good Milk Solutions



The Charm ROSA **SL** (**S**afe **L**evel)  $\beta$ -lactam Test is the test that most closely matches established regulatory levels. This means more 'good' milk is saved for dairy processing. Since its 1999 U.S. approval, the Charm **SL** has become the antibiotic test of choice by dairy processors, leading to significantly fewer milk rejections.

A recent report from the US National Milk Drug Residue Database<sup>1</sup> revealed a record low 0.021% positive rate on Grade A Bulk Milk Pick-Up Tankers by users of the Charm SL  $\beta$ -lactam test. This demonstrates the dairy industry's success in keeping antibiotic drug residues out of the milk supply.

To safeguard public health, regulatory limits for antibiotic residues in milk, be they Safe Levels, Tolerances, or MRLs (Maximum Residue Limits), are set conservatively. Use of an overly sensitive antibiotic test increases the risk of a non-violative positive result (a positive result when antibiotic are present below the regulatory threshold). Rejecting non-violative milk means that good milk, which is safe for human consumption, is unnecessarily discarded. Cost implications associated with dumping good milk include penalties, changes in production schedules and disposal costs.

### Current Approved $\beta$ -lactam Methods



In the US, detection limits are set by a validation process that includes testing by an independent laboratory. The sensitivity (screening detection concentrations) shown in Table 1 is based on detection 90% of the time with 95% confidence limit. Charm ROSA  $\beta$ -lactam Tests are closer to established regulatory limits, and do not leave a critical "Not Detected" gap on any of the targeted  $\beta$ -lactam drugs.

**Table 1: Beta-lactam Milk Drug Residue Screening Detection Concentrations<sup>2</sup>**

Beta-lactam Test	Amoxicillin	Ampicillin	Ceftiofur	Cephapirin	Cloxacillin	Penicillin
<b>US Tolerance or Safe Level</b>	<b>10 ppb</b>	<b>10 ppb</b>	<b>100 ppb<sup>3</sup></b>	<b>20 ppb</b>	<b>10 ppb</b>	<b>5 ppb</b>
Charm ROSA SL	5.6	8.5	77	13.7	50	3.6
Charm 3 SL3	8.4	8.0	79	20.0	8.6	3.8
Charm ROSA SL6 <sup>®</sup>	7.1	9.6	72	18.7	8.3	4.2
DSM Delvotest <sup>®</sup> P Mini	7.7	5.1	NA	7.0	30	3.1
DSM Delvotest <sup>®</sup> SP Mini	6.0	7.9	NA	7.7	33	2.7
DSM Delvotest <sup>®</sup> P 5 pack - Visual	4.6	4.0	ND	8.2	NA	2.1
DSM Delvotest <sup>®</sup> P 5 pack - Reader	4.6	4.0	ND	8.2	NA	2.1
Idexx New SNAP <sup>®</sup>	7.3	5.8	12	11.7	50	3.0
Neogen BetaStar <sup>®</sup> US	6.0	5.9	ND	19.5	9.1	4.8

NA = "Data Not Available"

ND = "Not Detected"

✓ Within 50% of Safe Level/ Tolerance

Charm Sciences specifically designs ROSA Tests to match established global regulatory limits, including EU MRLs and CODEX. This ensures the utmost safety of the milk supply.

<sup>1</sup> <http://www.kandc-sbcc.com/nmdrd/fy-09.pdf>

<sup>2</sup> Approved  $\beta$ -lactam Test Methods for Use Under Appendix N and Section 6 of the US Pasteurized Milk Ordinance (PMO), FDA M-a-85, Revision #13; <http://www.fda.gov/downloads/Food/FoodSafety/Product-SpecificInformation/MilkSafety/CodedMemoranda/MemorandaofInterpretation/UCM199136.pdf>

<sup>3</sup> The ceftiofur tolerance is based on measuring the sum of ceftiofur and desfuoylceftiofur related metabolites in milk such as desfuoylceftiofur. The screening test detection concentrations for ceftiofur were evaluated using milk containing ceftiofur and desfuoylceftiofur related metabolites from treated animals.



In Europe, more  $\beta$ -lactam drugs are detected by Charm ROSA MRL, at or below EU MRL, than any other test. ROSA MRL  $\beta$ -lactam test sensitivity is shown in Table 2.

**Table 2: Beta-lactam Sensitivity – Detection Ranges in Bovine Milk**

Beta-lactam	EU MRL <sup>4</sup> ( $\mu$ g/kg or ppb)	ROSA MRL Detection (ppb)
Amoxicillin	4	3 – 4
Ampicillin	4	3 – 4
Benzylopenicillin	4	2 - 3
Cefacetrole	125	8 - 18
Cefalexin	100	30 - 60
Cefalonium	20	3 - 5
Cefapirin	60	6 – 10
Cefazolin	50	12 - 20
Cefoperazone	50	5 - 9
Cefquinome	20	15 - 20
Ceftiofur <sup>5</sup>	100	10 - 20
Cefuroxime	50	3 - 5
Cloxacillin	30	25 - 35
Dicloxacillin	30	20 - 30
Penethamate	4	2 – 3

✓ At or below EU MRL



**Saving Good Milk.....Farm to Table**

Dairy farmers also recognize the importance of using the same test run by the milk buyer. As a result, more dairy farmers are choosing Charm tests to screen their bulk tanks and check individual cows. Producers prefer a test that ensures that their milk is free of residues from the most commonly used  $\beta$ -lactam antibiotics on dairy farms: ceftiofur, penicillin and cephalosporin<sup>6</sup>.

Charm Sciences is firmly committed to providing unique milk safety solutions that maximize brand protection, quality and value to the dairy industry and the consumer. With new offerings in the pipeline, Charm will continue to lead **Save Good Milk Solutions**.

<sup>4</sup> Commission Regulation (EU) No 37/2010 of 22 December 2009 on pharmacologically active substances and their classification regarding maximum residue limits in foodstuffs of animal origin.

<sup>5</sup> Expressed as total ceftiofur metabolite and parent.

<sup>6</sup> Zwald AG, Ruegg PL, Kaneene JB et al. Management practices and reported antimicrobial usage on conventional and organic dairy farms. J Dairy Sci 87:191-201, 2004.

**Charm Sciences, Inc.** 659 Andover Street, Lawrence, MA 01843-1032, USA

Tel: +1.978.687.9200 | Fax: +1.978.687.9216 | Email: info@charm.com | www.charm.com

© Copyright 2010 Charm Sciences, Inc. Charm and ROSA are registered trademarks of Charm Sciences, Inc. Delvotest is a registered trademark of DSM Food Specialties B.V. SNAP is a registered trademark of IDEXX Laboratories, Inc. BetaStar is a registered trademark of Neogen Corporation. MRK-217-002 1110