

# Reflectoquant® Peroxidase Test in Milk

Process validation for pasteurized milk made easy



# Lactoperoxidase Test in Milk

The Reflectoquant® Peroxidase Test in Milk simplifies the process control of heat treatment of milk without costliness.

It provides quantitative data, whether the pasteurization temperature was too high, and reliably distinguishes pasteurized milk from UHT milk.

This easy-to-handle and rapid method being according to DIN 10485-2 ensures quality products.

Thus, the risk of potential batch rejection is reduced significantly.

Regularly using the Reflectoquant® Peroxidase Test in Milk during the pasteurized milk production process provides confidence that the product meets the EU regulations on the lactoperoxidase activity.



## Reflectoquant® Peroxidase Test

# Your advantages

- Easy to use – minimal time and effort required for training
- Low cost – minimal investment required for RQflex®
- Reliable results – trustworthy quantitative method, objective instrumental measurement
- Low detection limit – detects even lower peroxidase activities than the EU reference method
- Rapid on the spot testing – remedial action can be taken immediately



## Ordering information

Product	Cat. No.
Reflectoquant® Peroxidase Test in Milk, kit for 50 tests, measuring 5-200 U/l (23°C)	1.16121.0001
RQflex® Reflectometer	1.16970.0001
RQflex® plus Reflectometer	1.16955.0001

Available in addition

Product	Cat. No.
Reflectoquant® Alkaline Phosphatase Test in Milk	1.16123.0001
Reflectoquant® Calcium Test	1.16125.0001
Reflectoquant® Lactic Acid Test	1.16127.0001
Reflectoquant® Lipase Test	1.05851.0001
Reflectoquant® Peroxide Test	1.16974.0001
Reflectoquant® Urea Test in Milk	1.16120.0001

further tests available

## Process validation made easy!

### What happens to lactoperoxidase during heat treatment?

Lactoperoxidase is an enzyme found in raw mammalian milk like in cowmilk. Native lactoperoxidase survives pasteurization of milk, but high-temperature pasteurized and UHT milk are lactoperoxidase-negative, because the enzyme is inactivated by proper heat treatment.

### Why to determine lactoperoxidase in heat-treated milk?

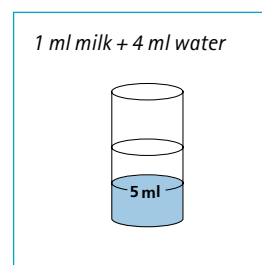
Effective heat treatment of milk is essential to ensure the absence of pathogenic microorganisms and hence safety during the shelf life of both pasteurized and UHT milk. The proper temperature and time control (i.e. avoiding over-heating) during processing can be confirmed if the lactoperoxidase, originally present in raw milk, still gives a positive result in pasteurized milk.

The regulations of the European Union (91/180/EEC and 92/46/EEC) claim that pasteurized milk must react lactoperoxidase-positive and phosphatase-negative. If pasteurized milk shows a negative reaction to the lactoperoxidase, the milk has to be labelled as "high-temperature pasteurized"

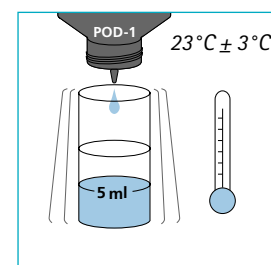
### How to easily measure lactoperoxidase?

In the Reflectoquant® Peroxidase Test in Milk, hydrogen peroxide serves as the substrate of the lactoperoxidase in the sample. The enzyme activity in the sample is proportional to the concentration of the blue dye formed. This is determined reflectometrically. The quantitative results are expressed in U/l.

## Performing the test as simple and fast as follows:



**1** Dilute milk sample 1:5 with dist. water. Take 5 ml of this sample.



**2** Add 5 drops of reagent POD-1, swirl and adjust to 23°C ± 3°C.



## Comparison of the Reflectoquant® Peroxidase Test in Milk with the Traventol® rapid method

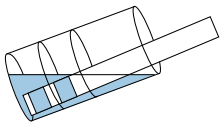


Amount of raw in UHT milk*	Results of Institute 1		Results of Institute 2		Results of Institute 3	
	with RQ Peroxidase Test in Milk	with Traventol® method	with RQ Peroxidase Test in Milk	with Traventol® method	with RQ Peroxidase Test in Milk	with Traventol® method
0 % raw milk	LOW	negative	LOW	negative	LOW	negative
0.5 % raw milk	0.3 %	negative	0.9 %	negative	-	-
1.0 % raw milk	1.1 %	negative	1.5 %	negative	0.5 %	negative
2.0 % raw milk	2.3 %	negative	2.8 %	negative	1.2 %	negative
3.0 % raw milk	3.2 %	positive	3.7 %	positive	1.8 %	negative
4.0 % raw milk	4.0 %	positive	4.7 %	positive	2.7 %	negative
5.0 % raw milk	4.9 %	positive	-	-	3.4 %	negative

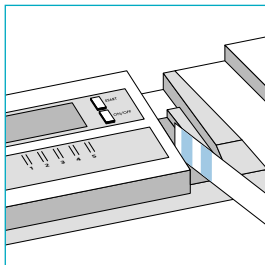
\*Each institute used its own raw milk and UHT milk samples from different cows. The raw milks contained different Lactoperoxidase activities.

Note: The Reflectoquant® Peroxidase Test is according to DIN 10483-2

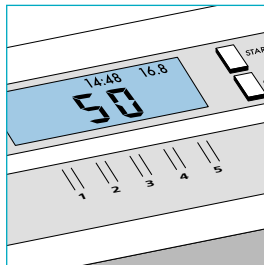
2 s



**3** Dip the test strip in this solution for approx. 2 s.



**4** Analyze test strip after 180 s with RQflex®.



**5** Read off the result from the display in U/l.

W285104 07/04



Merck KGaA  
64271 Darmstadt, Germany  
Fax +49 (0) 61 51/72 33 80  
E-mail: [environmental.analysis@merck.de](mailto:environmental.analysis@merck.de)  
Internet: <http://fea.merck.de>

We provide information and advice to our customers to the best of our knowledge and ability, but without obligation or liability. Existing laws and regulations are to be observed in all cases by our customers. This also applies in respect to any rights of third parties. Our information and advice do not relieve our customers of their own responsibility for checking the suitability of our products for the envisaged purpose. Reflectoquant® is a registered trademark of Merck KGaA, Darmstadt, Germany.