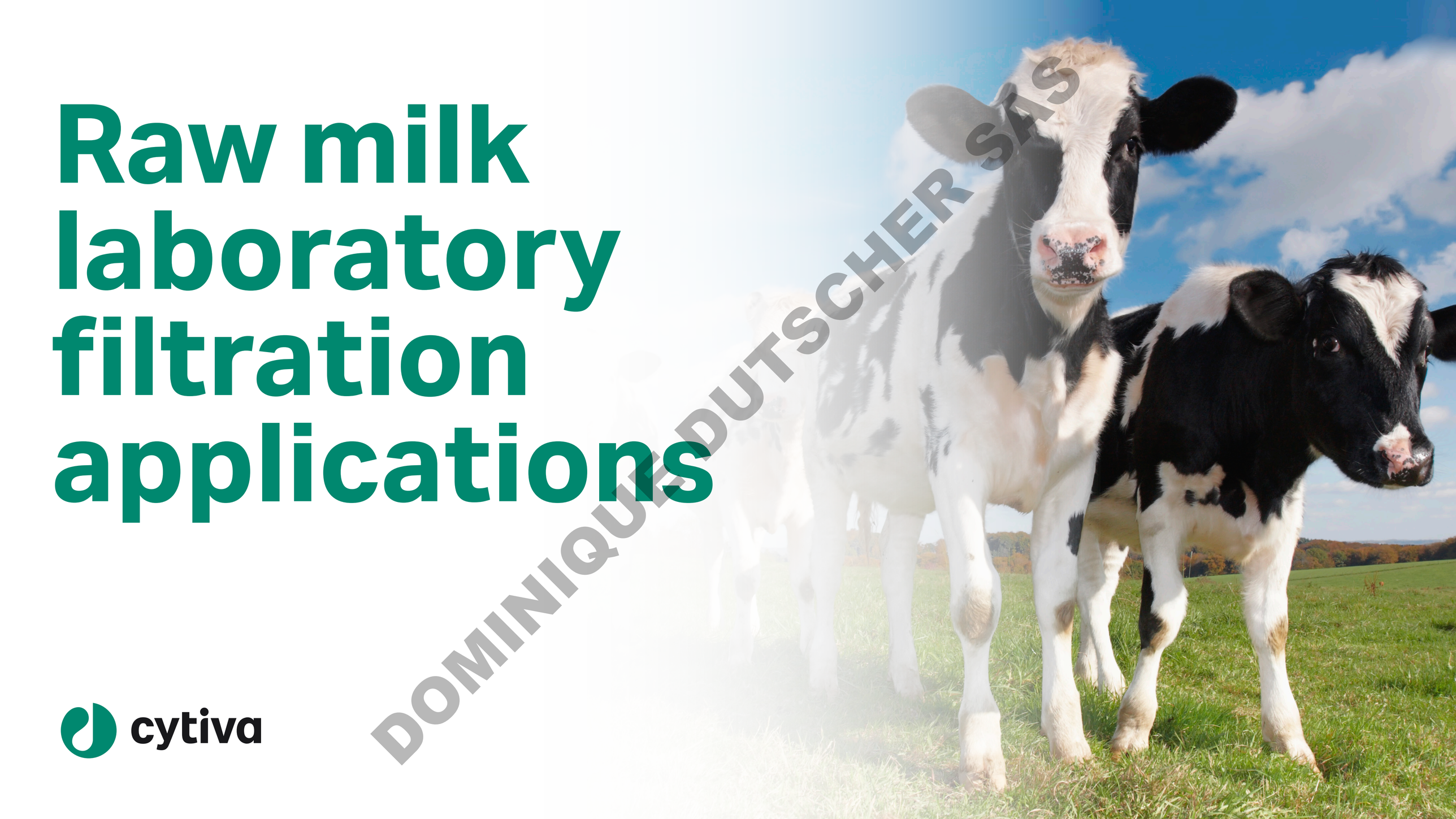
Raw milk laboratory filtration applications



DOMINIQUE DUTSCHER SAS

cytiva

Milk is a nutrient-rich liquid food with more than six billion people consuming milk and milk products globally.

The increasing demand has led to cases of milk adulteration, with the goal to deceptively increase the milk quality for economic gain. Milk can also be contaminated in many different ways, and both of these issues can cause serious harm to health and well-being of consumers.

Raw milk can undergo a number of analytical tests to confirm adulteration, quality and presence or absence of certain elements. Preparatory clarification filtration is an important step in these tests.

Analytical methods and recommended filters are based on ISO and AOAC standards as confirmed by the Food Safety and Standards Authority of India (FSSAI) manual of methods for analysis of milk and milk products.

This brochure highlights the key analytical applications used in the detection of adulterated milk, as well as a recommendation of a Whatman™ filter that would work best for each application.

DOMINIQUE DUTSCHER SAS



Contents

Key laboratory filtration application index pg 4

Nitrogen content determination by Kjeldahl analysis pg 5

Urea detection by spectro-colorimetric method pg 7

Sulphate detection pg9

Heavy metal contamination tests by atomic absorption spectroscopy pg 11

DOMINIQUE DUTSCHER SAS

Key laboratory filtration application index

		Industry			LF workflow				Raw ingredient	Analytical systems
	Key application	Small	Medium	Large	Collect	Prepare	Analyze	Incubate	Raw milk	AAS
Nitrogen content determination	★	●	●	○		P	A		🥛	
Urea detection		●	●	○		P	A		🥛	⚛
Sulphate detection		●	●	○		P	A			
Heavy metal detection		●	●	○		P	A			⚛

AAS = Atomic absorption spectroscopy

DOMINIQUE DUTSCHER SAS

Nitrogen content determination by Kjeldahl analysis

Nitrogen levels can be measured in milk and milk products by the Kjeldahl analytical process. The measured levels can then be used to calculate the total and true protein values.

A recommended test method is by Kjeldahl analysis, always taking care to use specialty filter papers and weighing boats with low nitrogen content to avoid influencing the test results.

DOMINIQUE DUTSCHER SAS

Key application | Small | Medium | Large | Collect | Prepare | Analyze | Incubate | Raw milk | AAS



Filter papers

Whatman Grade 1 filter papers are the most widely used for general laboratory filtration, and are recommended for use in preparing filtrate samples. They are recommended to be used in the Kjeldahl analysis of nitrogen content by filtering and collecting the filtrate. Filter papers are available in a variety of diameters and pre-folded options.

Ordering information

Description	Quantity	Product code
Grade 1, 47 mm	100	1001-047

Methods

FSSAI #	19.2, 19.3



Weighing boats

Whatman Kjeldahl weighing boats are an easy way to transfer solid dairy samples safely and reliably by dropping the entire boat and contents loss-free into the acid solution.

Made from a very low nitrogen parchment paper, it will not influence the analytical result in any way.

The boats are available in a variety of sizes and sheet options.

Ordering information

Description	Quantity	Product code
Weighing Boats, 55 × 10 × 10 mm	100	10313032



DOMINIQUE DUTSCHER SAS

Urea detection by spectro-colorimetric method

Urea is a natural constituent of milk, making up a major portion of the non-protein nitrogen.

Milk can be adulterated with additional urea to deceptively increase the quality for economic gain.

One adulteration detection test for urea is by a color-based chemical reaction and detection by UV/V is spectroscopy.

DOMINIQUE DUTSCHER SAS

Key application	Small	Medium	Large	Collect	Prepare	Analyze	Incubate	Raw milk	AAS
					P	A			

Filter paper filtration

The removal of precipitated milk proteins is a key preparation step prior to colorimetric analysis of urea content.

Whatman quantitative filters are designed for preparing samples gravimetrically for instrument analysis.

Whatman Grade 42 with its high particulate retention rate, is recommended to prepare samples for critical analyses.

Filter papers are available in a variety of diameters and pre-folded options.



Ordering information

Description	Quantity	Product code
Grade 42, 110 mm	100	1442-110

Methods

FSSAI #	1.2.4

DOMINIQUE DUTSCHER SAS

Sulphate detection

The Solids Not Fat (SNF) level is the percentage of milk that consists of everything except milk fat and water. Milk composition is based on the fat and SNF values, and the SNF percentage plays a large role in determining dairy product price in some countries.

Milk can be adulterated with various sulphate salts to increase the SNF value, and deceptively increase the milk quality for economic gain.

A key detection test for sulphates is the visual detection of precipitates, using barium chloride and trichloroacetic acid.

DOMINIQUE DUTSCHER SAS

Key application	Small	Medium	Large	Collect	Prepare	Analyze	Incubate	Raw milk	AAS
	●	●	●		P	A			

Filter paper filtration

The removal of coagulated milk proteins is a key preparation step prior to visual analysis of precipitates.

Whatman quantitative filters are designed for preparing samples gravimetrically for instrument analysis.

Whatman Grade 42, with its high particulate retention rate, is used to prepare samples for critical analyses.

Filter papers are available in a variety of diameters and pre-folded options.



Ordering information

Description	Quantity	Product code
Grade 42, 110 mm	100	1442-110

Methods

FSSAI #	1.2.6

DOMINIQUE DUTSCHER SAS

Heavy metal contamination tests by atomic absorption spectroscopy

Heavy metals are a very important contaminant due to its substantial effects on human health. As traces of these metals can make its way into milk and dairy products, the detection of any contamination is extremely important.

The presence and concentration of these contaminants can be detected and measured through the use of Atomic Absorption Spectroscopy (AAS).

Whatman offers a range of specialized filter paper and devices to use in the pre-filtering of samples prior to analysis.

DOMINIQUE DUTSCHER SAS

Key application	Small	Medium	Large	Collect	Prepare	Analyze	Incubate	Raw milk	AAS
									

Filter paper filtration

The clarification and removal of suspended particles prior to atomic absorbance spectroscopy is an important preparatory step, and the use of a filter paper that is free of the relevant ions is recommended.

Whatman Grade 589/1 is a quantitative ashless filter paper which contains very low levels of ions: it will not influence the analytical results in any way.

Filter papers are available in a variety of diameters and pre-folded options.

Ordering information

Description	Quantity	Product code
Grade 589/1, 90 mm	100	10300009



DOMINIQUE DUTSCHER SAS

Cytiva offers a range of high-quality Whatman filtration products for raw milk lab applications. Use this guide to find the recommended filters and devices for your applications.



DOMINIQUE DUTSCHER SAS

cytiva.com

Cytiva and the Drop logo are trademarks of Global Life Sciences IP Holdco LLC or an affiliate. Whatman is a trademark of Global Life Sciences Solutions USA LLC or an affiliate doing business as Cytiva.

© 2021 Cytiva

For local office contact information, visit cytiva.com/contact

CY17066-27Jan21-BR

DOMINIQUE DUTSCHER SAS

