

Digital holographic microscopy (DHM)

DHM is an innovative technique newly introduced to veterinary in vitro diagnostic field. It involves illuminating the sample with light, where some is diffracted while some passes through without seeing the sample. The diffracted light interacts with the non-diffracted light, creating a hologram captured by an image sensor. This digital reconstruction provides valuable information about the different elements such as blood cells, crystals or casts distributed within the sample.



Red Blood Cells



White Blood Cells



Epithelial Cells



Crystals



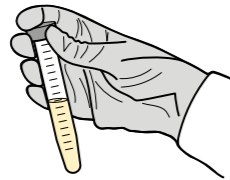
Casts



Bacteria
(flagging of suspected presence)

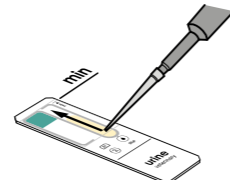
Workflow

1



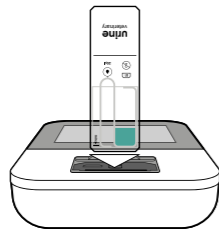
Collect your sample in a sterile manner. Fill in all patient information on your device.

2



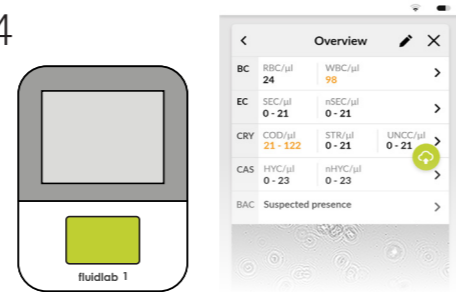
Take a glass slide out of the box. Mix the sample properly and aspire right away to avoid sedimentation. Fill the glass slide completely up to „min“-mark with 20 µL urine.

3



Insert the glass slide into the device. The measurement starts automatically. You'll receive the result in a few minutes.

4



Scroll down through the result screen to see the results and the microscopic image. Measurements can be saved and additionally transferred to a computer.

Technical specifications

vet fluidlab 1

Method	Digital Holographic Microscopy (DHM)
Sample centrifugation	No
Sample pipetting	Yes
Sample volume required for analysis	20 µL
Analyzed parameters	Red Blood Cells/White Blood Cells Squamous Epithelial Cells/Non-squamous Epithelial Cells Hyaline Casts/Non-hyaline Casts Calcium Oxalates Dihydrates/Struvites/Unclassified crystals Bacteria (suspected presence)
Consumables	Glass slide
Dimensions	128 x 94 x 33 mm
Weight	0.24 kg



Urine microscopy

In the palm of your hand

Microscopic examination of urine is an essential tool for screening and monitoring diseases and conditions such as urinary tract infections or kidney disorders in animals. However, automated methods in primary care can be cost-intensive, while manual analysis may result in inaccuracies. The lack of standardization in urine microscopy poses a significant challenge for veterinarians.

The vet fluidlab 1 utilizes state-of-the-art quantitative phase imaging technology to enable automated urine microscopy of uncentrifuged samples. This approach facilitates faster diagnoses through point-of-care (POC) methodology while eliminating unnecessary intermediate steps in sample preparation.

Ready-to-use

- Ready-to-use slide
- Small sample volume (20 µL)
- Step-by-step guide on the device

Compact

- Fits in every practice
- Maintenance-free
- Recalibration-free

Reliable

- Standardized analysis
- Objective interpretation
- Reproducible results

Immediate

- Low hands-on time (3 steps)
- No centrifugation
- Quick clinical decisions



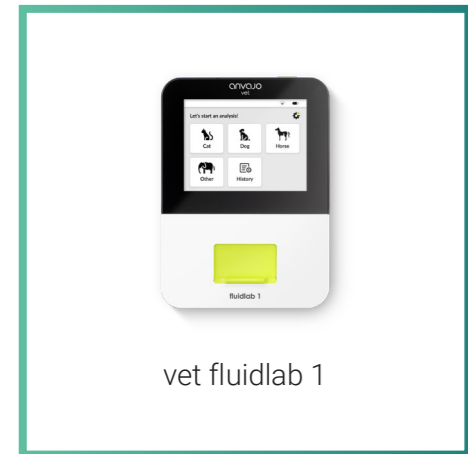
vet fluidlab 1

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Three components of urinalysis

vet fluidlab 1 completes the entirety of urinalysis together with the urine strips and refractometer but offers measurable precision for urinalysis.

Urine microscopy



Urine chemistry



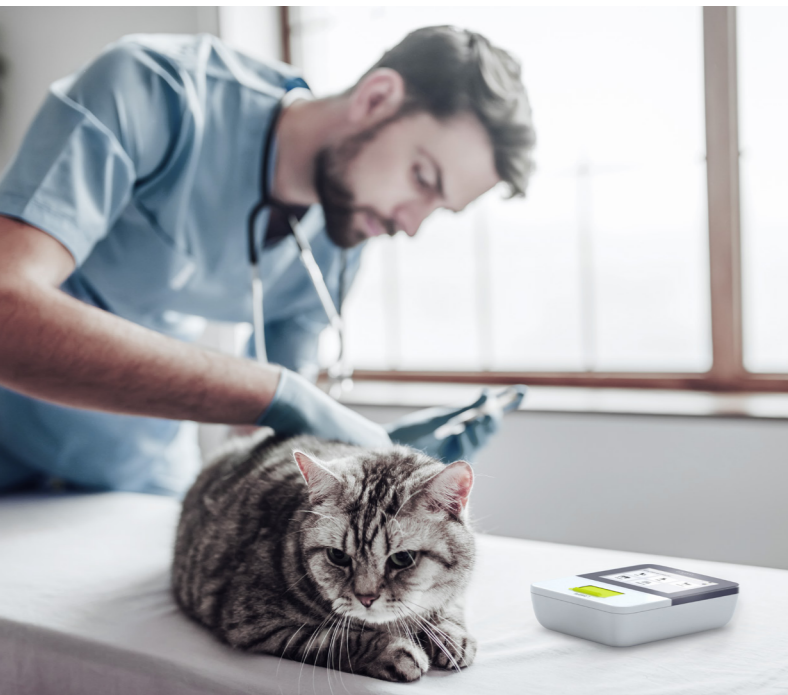
Urine strips

Specific gravity



Refractometer

The rationale for utilizing uncentrifuged urine for urinalysis



In the field of human medicine, the benefits of using uncentrifuged urine for analysis have become increasingly evident. Recent 2023 updates in the European urinalysis guidelines lean towards recommending the utilization of uncentrifuged urine for diagnostic purposes.

„A quantitative result for urine particles is more reliably obtained by direct counting of uncentrifuged specimens in a chamber than after centrifugation.“ [1]

Advantages of using uncentrifuged urine

- 1. Accurate quantification**
Uncentrifuged urine avoids potential loss of erythrocytes and leukocytes, ensuring accurate quantification without significant relative losses, which can range from 20 to 80%. By bypassing centrifugation, these errors are mitigated, thereby preserving the analytical sensitivity and enhancing test result accuracy. [2]
- 2. Enhance precision**
By eliminating the need for centrifugation, the discrepancy reduction ensures a closer alignment between theoretical and practical concentrations, especially for smaller particles. [3]
- 3. Reduce hands-on time**
This not only increases efficiency but also reduces human errors, minimizes labor-intensive steps, and optimizes workflow in clinical settings.

Urine Microscopy Parameters

Measured Parameter		Clinical Significance	Negative in N/μL in N/HPF	Low in N/μL in N/HPF	Medium in N/μL in N/HPF	High in N/μL in N/HPF	Very High in N/μL in N/HPF
Blood Cells	Red Blood Cells (RBC)	Urinary tract disease or bleeding (inflammation, infection, stones, tumors, etc.)	0-25 0-5	25-100 5-25	100-500 25-100	>500 >100	
	Leukocytes (WBC)	Inflammation or infection in the urinary tract (pyelonephritis, cystitis, etc.)	0-15 0-3	15-30 3-6	30-100 6-20	100-250 20-50	>250 >50
Epithelial Cells	Squamous Epithelial Cells (SEC)	Often due to poor sample collection	0-5 0-1	5-25 1-5	25-50 5-10	50-100 10-20	>100 >20
	Non-squamous Epithelial Cells (nSEC)	Increased number may indicate urinary tract inflammation, infection, kidney stones, or renal tubular disease	0-5 0-1	5-25 1-5	25-50 5-10	50-100 10-20	>100 >20
Crystals	Calcium Oxalate Dihydrate (COD)	Causes and likelihood of stones, clinical significance depends on their type and quantity	0-5 0-1	5-30 1-6	30-105 6-21	105-250 21-50	>250 >50
	Struvite (STR)		0-5 0-1	5-30 1-6	30-105 6-21	105-250 21-50	>250 >50
	Unclassified Crystals (UNC)		0-5 0-1	5-30 1-6	30-105 6-21	105-250 21-50	>250 >50
Casts	Hyaline Cast (HYC)	Might not be significant in lower numbers, can be present when taking medications that affect the kidney	0 0	>1 >1	Presence (suspicion of abnormality) unit/μl unit/LPF		
	Non-hyaline Cast (nHYC)	Suggests renal conditions such as glomerulonephritis or pyelonephritis and chronic renal failure	0 0	>1 >1			
Bacteria	BAC	Suspected bacteria infection	Negative Negative	Suspected Presence Suspected Presence			

[1] Kouri, T., Hofmann, W., Rosanna, F., Oyaert, M., Schubert, S., Berg Gertsen, J., ... Pestel-Caron, M. (2023). The EFLM European Urinalysis Guideline Update 2023. Haikaraportti 4 B 22, FIN-02620 Espoo, FINLAND. 178.
 [2] Delanghe, J., & Speeckaert, M. (2014). Preanalytical requirements of urinalysis. Biochemia Medica, 89-104.
 [3] Ichihyanagi, Y. (2014). Field Volume of Urine Sediment Test - Comparison of Theoretical Volume with Practical Volume -. Sysmex Journal International Vol.24 No.1.