Bioanalysis

D·Mark

MACHEREY-NAGEL

Single spin nucleic acid isolation from veterinary samples

NucleoSpin® VET

The versatile high-performer for veterinary diagnostic

- Validated for various sample matrices
- One size fits all – one standard protocol for all matrices
- FastTrack protocol for rapid routine testing

Extraction of viral RNA/ DNA and bacterial DNA from veterinary samples

NucleoSpin® VET

Silica-membrane based viral RNA / DNA and bacterial DNA isolation from veterinary samples

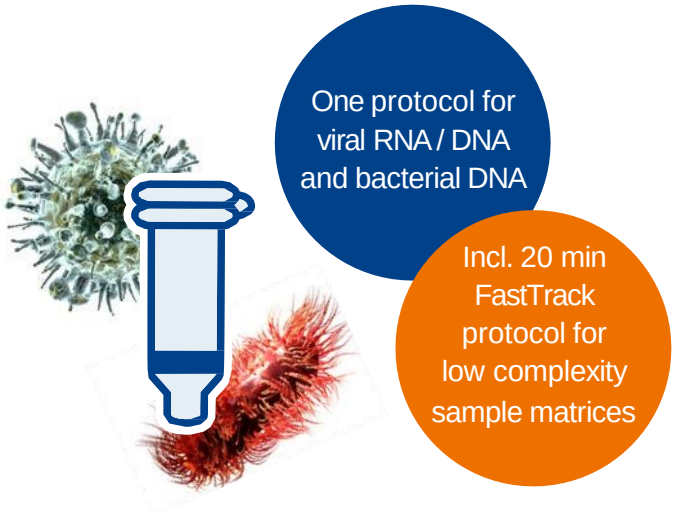
Modern veterinary diagnostic laboratories must be able to collect and subsequently analyze hundreds of samples fully automatically every day – especially in times of disease outbreaks.

Despite high levels of automation, many samples still require manual nucleic acid purification. This is particularly the case when there is a low sample load, when difficult and inhomogeneous samples (e. g. feces) have to be analyzed, or when new methods are to be established in a veterinary laboratory. For such cases, MACHEREY-NAGEL has developed the NucleoSpin® VET single spin kit for the isolation of viral RNA / DNA and bacterial DNA from various veterinary sample materials.

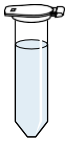
The silica membrane-based kit is a „one-for-all“ kit solution and has been developed for nucleic acid extraction for various sample matrices such as serum, plasma, animal whole blood, tissue, feces, swabs and other cell-free biological samples. For rapid routine testing, the kit includes a FastTrack protocol for easy-to-lyse, low-complexity matrices (plasma, swabs). The FastTrack protocol is focused on speed and ease of use combined with maximum sensitivity.

Product at a glance

Technology	Silica membrane technology
Format	Single spin format
Sample amount	200 µL serum 200 µL plasma 200 µL cell-free biological fluids, e.g. milk 5 – 10 mg tissue 100 µL animal blood 100 mg feces/stool 1 dry or wet swab
Fragment size	Approx. 100 bp – 50 kb
Elution colume	40 – 100 µL
Processing time	20 – 40 min



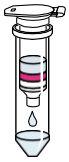
Easy handling – One standard protocol for all sample materials



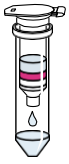
Lysis*

*pretreatment depends on starting material

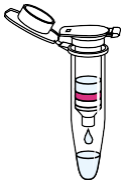
Standard protocol



Binding



Washing



Elution

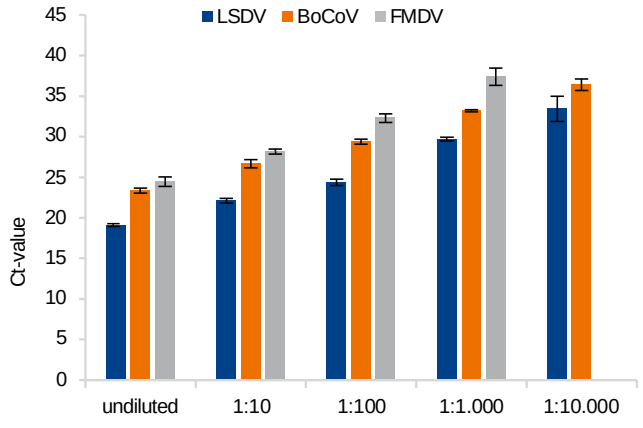
Nucleic acid purification protocol

The NucleoSpin® VET kit enables efficient purification of viral RNA and DNA, as well as bacterial DNA, from a broad range of veterinary-relevant sample types. All samples can be purified following the same standard protocol after sample lysis. The sample lysis pretreatment depends on starting material and target pathogen.

Extraction of viral RNA/ DNA and bacterial DNA from veterinary samples

Application data

A



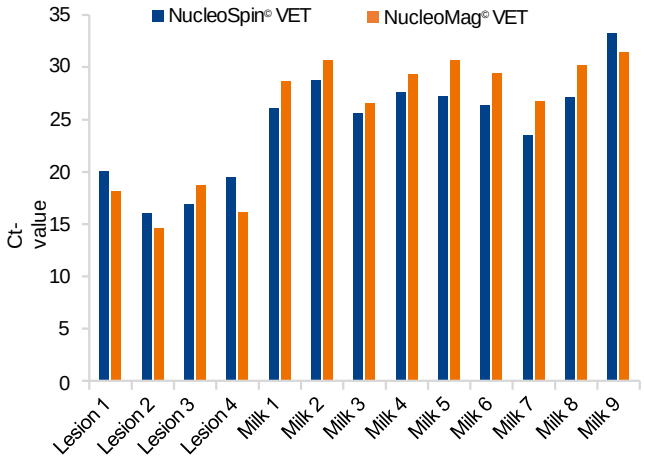
Reliable viral DNA and RNA recovery with NucleoSpin® VET kit from bovine blood

The NucleoSpin® VET kit was used for viral DNA and RNA isolation from bovine EDTA blood with diverse virus load. The thawed bovine blood was spiked with LSDV (lumpy skin disease virus; DNA virus), BoCoV and FMDV (bovine corona virus, foot-and-mouth-disease virus; RNA viruses) at various dilution levels. The samples were purified using the NucleoSpin® VET kit following the standard protocol procedure and eluates were subsequently analyzed via RT-qPCR using AgPath-ID™ One-Step RT-PCR reagents (ThermoFisher Scientific).

The NucleoSpin® VET kit shows consistent and reliable viral RNA and DNA recovery from high to low viral titer samples (FMDV titer in 1:10000 dilution was below detection limit).

Data kindly provided by Hanna Keck and Michael Eschbaumer, Fried- rich-Loeffler-Institut, Federal Research Institute for Animal Health of Germany.

B

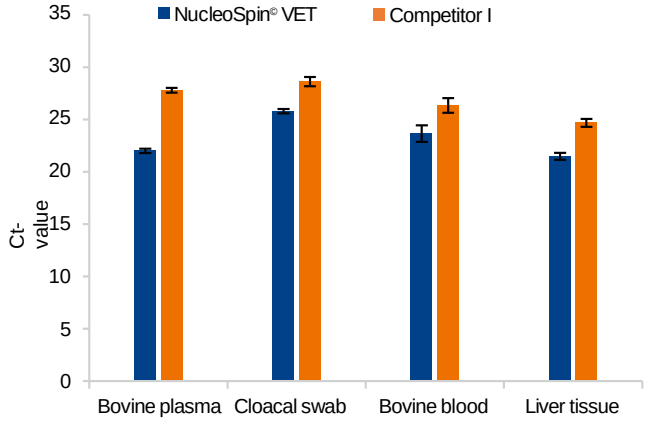


RT-qPCR detection of foot-and-mouth disease virus in bovine milk and skin lesions

To compare manual and automated extraction, the NucleoSpin® VET and the NucleoMag® VET were used to isolate viral RNA from known FMDV-positive samples (foot-and-mouth-disease virus). The samples were purified using the NucleoSpin® VET kit following the standard protocol procedure and in parallel with the magnetic bead based NucleoMag® VET kit (100 µL sample input). Eluates were subsequently analyzed via RT-qPCR using AgPath-ID™ One-Step RT-PCR reagents (ThermoFisher Scientific). The results show that both kits performed comparably well, even with difficult samples such as very fatty milk or skin lesions.

Data kindly provided by Hanna Keck and Michael Eschbaumer, Friedrich-Loeffler-Institut, Federal Research Institute for Animal Health of Germany.

C



Market leading performance compared to competitor products

Extractions from cloacal swab solutions, chicken liver tissue, bovine blood and bovine plasma samples were spiked with MS2 viral RNA. Nucleic acid purifications were performed using the the NucleoSpin® VET kit and using an extraction kit from competitor I. qPCR analysis was performed using the Bioline SensiFAST™ SYBR Lo-ROX One-Step kit to determine the simulated viral titer load in the different sample matrices. The qPCR data show highest performance with the NucleoSpin® VET compared to the competitor I kit.

Ruminants | Swine | Poultry | Equine | Companion animals

Extraction of viral RNA/ DNA and bacterial DNA from veterinary samples

Application data

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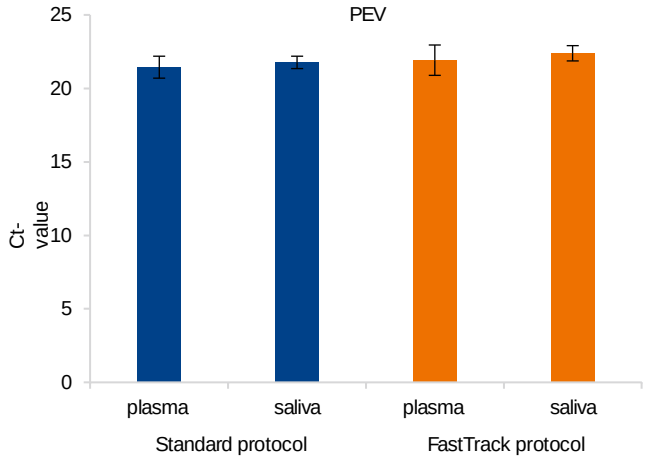

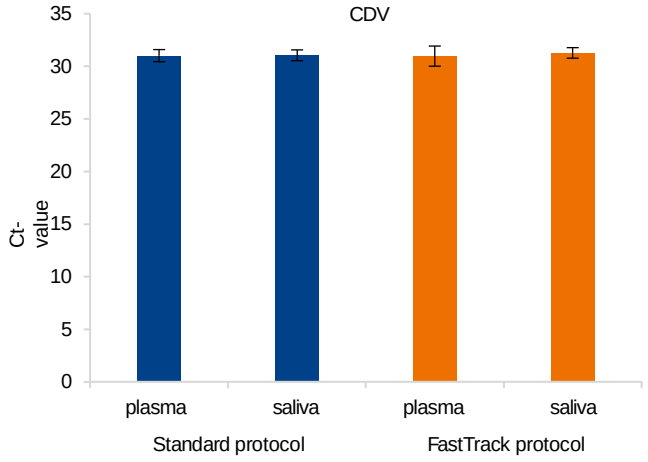

Comparable sensitivity of Standard and FastTrack protocol

The NucleoSpin® VET kit includes a FastTrack protocol for rapid, routine testing of low complexity sample matrices (e. g. plasma, swab solutions). The FastTrack protocol has been optimized in terms of pipetting steps, standardized volumes and change of centrifuge settings, allowing fast and simple sample extraction. The FastTrack can be applied to the processing of plasma, serum or swab solutions. We recommend that users start with the standard protocol first and validate the use of the the FastTrack protocol for their specific sample material.

The data show comparable qPCR results (Ct values) after extraction of CDV (canine distemper virus; RNA virus) or PEV (porcine enterovirus; RNA virus) viral nucleic acids from plasma or saliva samples. Viruses were spiked into bovine plasma or saliva, extracted according to the standard or the FastTrack protocol, and analyzed via qRT-PCR using AgPath-ID™ One-Step RT-PCR reagents (Thermo Fisher Scientific).

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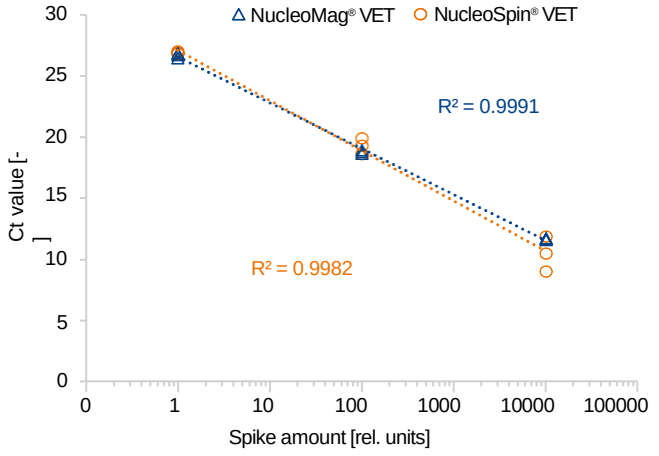
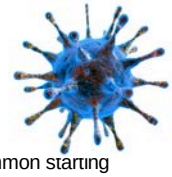


Comparable sensitivity and linearity for NucleoSpin® VET and NucleoMag® VET kit for high to low titer samples

Different dilutions MS2-RNA were spiked into extractions of bovine EDTA-plasma simulating low, medium and high titer samples. Nucleic acid purifications were done using the NucleoSpin® VET (manual single spin purification) and the NucleoMag® VET kit (magnetic bead-based automated extraction) and analyzed via RT-qPCR using the Bioline SensiFAST™ SYBR Lo-ROX One-Step kit. The results show reliable purification of viral nucleic acids from low to high titer samples and com- parable sensitivity to extraction using the proven magnetic bead-based NucleoMag® VET kit (MACHEREY-NAGEL).



NucleoSpin® VET product features at a glance

Isolation of veterinary pathogen nucleic acids from all common starting materials

- One standard protocol for all specimen matrices after sample pretreatment
- Including FastTrack protocol for for rapid routine testing
- Efficient removal of inhibitors and contaminants even when working with difficult sample matrices (e. g. feces or fatty raw milk)
- Eluates are ready-to-use for all common downstream analysis methods, e. g. (RT)-qPCR or NGS

Do you have any questions?

Please contact the experts for technical support!

orders@dmarkbio.com · 416.297.8220

Ordering information

Product	Specifications	Pack	REF
NucleoSpin® VET	NucleoSpin® VET columns, collection tubes (2 mL), collection tubes for lysis and elution (1.5 mL), buffers, liquid Proteinase K, carrier RNA (lyophilized)	10 / 50 / 250	740842.10 / .50 / .250
MN Bead Tubes Tpye D	3 mm steel beads for the homogenization of tissue samples	50	740814.50

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MACHEREY-NAGEL

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