MACHEREY-NAGEL

NucleoMag® DNA Food

Automated purification of DNA from food and feed samples on the ep*Motion*® 5075t platform

Introduction

The rapid detection of foodborne pathogens via molecular detection methods have major advantages compared to (time consuming) classical culture based methods. Furthermore, the isolation of genomic DNA from food and feed samples is widely performed with the purpose of species identification, GMO testing, or detection of foodborne pathogens.

One common issue during DNA isolation from food and feed samples, is the vast diversity in terms of consistency and composition. Food samples are very heterogeneous and contain many different components, like lipids, polysaccharides and high content of proteins, which are released during DNA extraction. In subsequent biomolecular applications these compound related interferences have a strong impact by, e.g., interaction with nucleic acids or disturbing DNA polymerase activity. Furthermore, processed and complex food matrices often exhibit a very low and degraded DNA content. To circumvent the diverse sample matrix based obstacles, MACHEREY-NAGEL developed the NucleoMag® DNA Food kit, allowing rapid and reliable purification of genomic DNA from food and feed samples in a 96-well format.

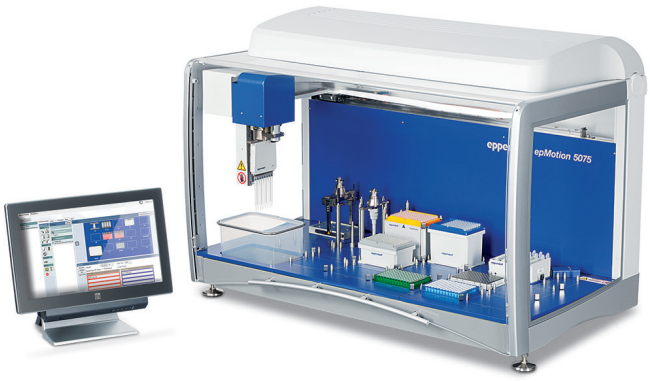
This Application Note describes the automated process on the automated liquid handling ep*Motion*® 5075t workstation using the NucleoMag® DNA Food Kit from MACHEREY-NAGEL. We show the deck configuration and ep*Motion*® 5075t automated liquid handling instrument setup including the automated workflow for genomic DNA purification from various food sample material. The tailored protocol allows the processing of 8 to 96 (variable sample number in multiples of 8) samples. Processing time for 96 samples is approx. 120 minutes.

Product at a glance

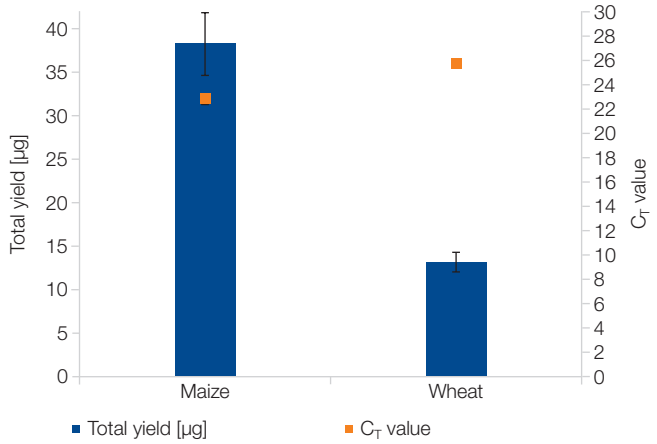
NucleoMag® DNA Food	
Technology	Magnetic beads
Sample material	≤ 200 mg food or feed
Preparation time	Approx. 120 min on ep*Motion*® 5075t workstation
Typical yield	0.1–10 µg, depending on sample quality yield can be higher.
Elution volume	50–200 µL

Material and methods

Samples from up to 200 mg food or feed are lysed with Buffer CF and Liquid Proteinase K for 30 minutes at 65 °C. Depending on the sample type lysis conditions, like buffer volume and incubation time might change (please see the NucleoMag® DNA Food kit manual for more detailed information). After centrifugation the cleared lysate is transferred to a Square-well Block for further processing. Subsequent DNA isolation is performed on the automation platform ep*Motion*® 5075t. The isolation principle is based on reversible adsorption of nucleic acids to paramagnetic beads under appropriate buffer conditions.

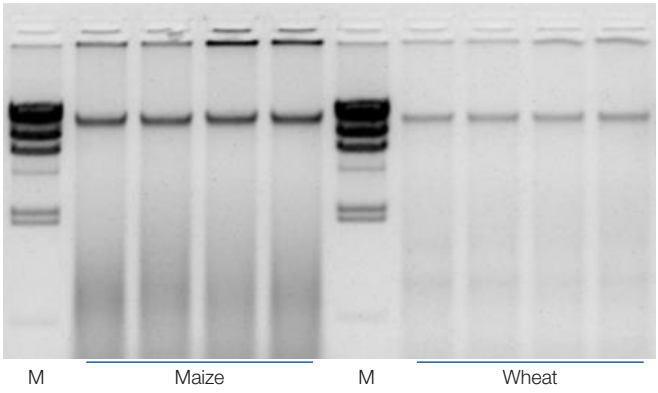


Application data



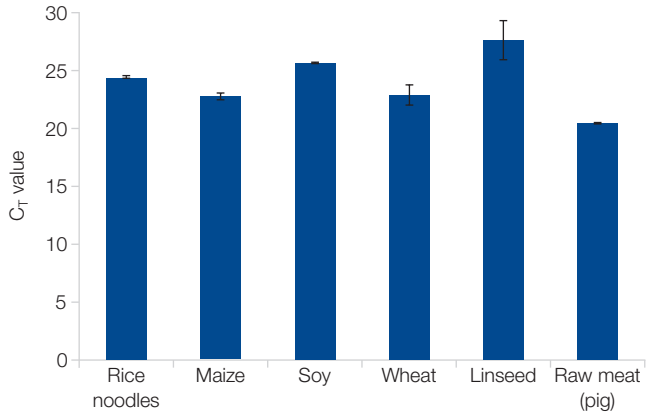
Automated isolation of DNA from maize and wheat samples

DNA was isolated from maize and wheat sample material (n = 8; 200 mg each sample) using the NucleoMag® DNA Food kit on the ep*Motion*® 5075t platform. Total yield was determined by UV spectrometry (dark blue bars). A subsequent qPCR analysis was performed for a 103 bp actin amplicon using the SensiFast™ Probe Lo-ROX kit from BioLine on an Applied Biosystems® 7500 Real-Time PCR System.



Integrity of genomic DNA from maize and wheat samples

DNA was isolated from maize and wheat sample material (n = 8; 200 mg each sample) using the NucleoMag® DNA Food kit on the ep*Motion*® 5075t platform. The integrity was exemplarily analyzed by gel electrophoresis (1 µL per eluate; 1 % TAE gel; M: Lambda DNA/Hind III – Thermo Scientific).



qPCR analysis of purified DNA from various food and feed samples

DNA was isolated from different food and feed samples (n = 4; 200 mg each sample) including raw meat, seeds, or shredded soybeans (dark blue bars) using the NucleoMag® DNA Food kit the ep*Motion*® 5075t platform. A subsequent qPCR analysis was performed for a 103 bp actin amplicon using the SensiFast™ Probe Lo-ROX kit from BioLine on an Applied Biosystems® 7500 Real-Time PCR System.

Automate your genomic DNA extraction from food and feed samples

MACHEREY-NAGEL and Eppendorf® deliver a tailored solution for your high throughput DNA extraction from food and feed sample material.

- Reliable performance and excellent DNA yields for e.g., species identification and GMO detection.
- Excellent recovery from diverse and challenging food matrices.
- Tailored protocol for processing variable sample number in multiples of 8 samples (8–96).

Ordering information

Product	Specifications	Pack of	REF
NucleoMag® DNA Food	Kit based on magnetic bead technology for the isolation of genomic DNA from food and feed samples including NucleoMag® B-Beads, buffers, Liquid Proteinase K	1 x 96 / 4 x 96	744945.1 / .4
NucleoMag® SEP	Static magnetic separator	1	744900
ep*Motion*® 5075t	Basic device incl. Eppendorf ThermoMixer®,epBlue™ software, mouse, waste box, 100–240 V ±10 % / 50–60 Hz ±5 %, 0.2 µL–1 mL; EU-plug		5075000302