

Laboratory
Information



CarnoCheck®:

Simultaneous identification of 8 animal species in food products.

CarnoCheck® is part of the oCheck® product line from Greiner Bio-One GmbH



CarnoCheck®

DNA chip for the simultaneous identification of 8 animal species in meat food products

The horse meat scandal in 2013 highlighted the false declaration of meat food products. Food adulteration may remain undetected, because most routine analysis methods cover only a limited panel of parameters which are screened in one run. New technologies can help to establish a wider screening panel in routine food testing and therefore support the safety of the food supply chain. Microarray technology allows simultaneous identification of a number of parameters in a single analysis.

CarnoCheck® is a microarray-based test kit for the identification of eight animal species in food products that contain meat. The simultaneous identification of pig, cattle, sheep, turkey, chicken, horse, donkey and goat in raw and preserved food matrices can be achieved in an analysis time of three hours. The test platform consists of an HTA™Slide¹ with species specific DNA probes based on differences in the sequence of the *cytochrome b* (cyt-b) gene spotted and immobilised in each of the 12 wells bordered by elevated rims. CarnoCheck® is offered as a complete “ready-to-use” kit but requires further equipment for analysis.

Prior to amplification of the species cyt-b gene with only one single PCR primer pair, the sample must be homogenised and the genomic DNA extracted. Species differentiation is accomplished by the hybridisation of the fluorescently labeled PCR products to the CarnoCheck® microarrays. Each microarray contains replicates of species specific probes and a sophisticated set of internal and external controls making CarnoCheck® a robust and reliable

DNA based detection system. Even more product safety is added due to the automatic digital evaluation and report generation, which practically excludes false-positive and false-negative results.

The major advantage of CarnoCheck® in comparison to other routine methods is that all eight different species are detected within a single analysis. CarnoCheck® is an effective tool for the screening of species contamination in meat products. CarnoCheck® kit options allow either six or 12 tests to be conducted in parallel on one chip. This multiplexing capacity effectively reduces testing time.

The FAPAS (Food Analysis Performance Assessment Scheme, UK) proficiency testing is an essential element of laboratory quality assurance. It is an important requirement of the EU Additional Measures Directive 93/99/EEC which applies to official food testing laboratories. The analysis of an external quality check sample provides objective standards for quality of the analysis of an individual laboratory. CarnoCheck® participated successfully in FAPAS proficiency tests.

¹ The HTA™Slide platform is covered by U.S. Patent No. 8.007.744.

Working schedule for CarnoCheck®

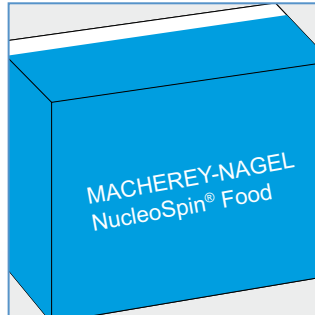
Identification within 3 hours



1 Sample Collection

Duration: 30 min

100 mg of a homogenous meat food product is collected.



2 DNA Extraction

Duration: 30 min

The DNA is extracted by the NucleoSpin® Food DNA Extraction Kit from Macherey Nagel.



3 PCR

Duration: 90 min

A fragment of the *cytochrome b* gene and a control target are amplified by PCR and fluorescently labeled. The amplification products are then hybridised to complementary DNA probes on the chip.



4 Hybridisation

Duration: 20 min

Each species is detected by a specific DNA probe present in five replicates.



5 Washing & Drying

Duration: 5 min

Unbound DNA is removed in the subsequent washing steps.



6 Scanning & Analysis

Duration: 10 min

The CarnoCheck® chip is scanned, analysed and evaluated using the CheckScanner™ (cat. no. 862 070) and CheckReport™ Software (cat. no. 862 080 and 862 084).

A report is created that clearly indicates the presence or absence of one or more of the animal species detectable.

Animal species detectable with CarnoCheck®:



¹ In case of detection of a chicken species, the presence of duck species cannot be excluded.

At a glance: CarnoCheck®

CarnoCheck® is a DNA based microarray for the determination of animal constituents which allows a rapid and reliable quality control of food products and thus strengthen the confidence of the consumer. With CarnoCheck® eight different animal species can be unequivocally and reliably identified in raw, cooker preserved, boiled or fully preserved ($F \leq 3,4$), meat food products. The low limit of detection (0.25 – 1 %, depending on the processing) permits the identification of even small traces of animal constituents.

CarnoCheck®

- The detailed control of meat containing food
- DNA based assay for the simultaneous identification of all 8 animal species
- Parallel processing of up to six or 12 samples due to an innovative chip carrier design
- Complete kit with DNA-chips and solutions for 30 or 60 investigations
- Rapid digital evaluation and archiving of the results
- Validation by external food and research institutes ^{2,3}



Cat. No.	462 030	462 060
Description	CarnoCheck® Identification of 8 animal species	CarnoCheck® Identification of 8 animal species
Platform	HTA™Slide 12	HTA™Slide 12
Content	30 tests per kit	60 tests per kit

² Iwobi AZ, Huber I, Hauner G, Miller A, Busch U. Biochip Technology for the Detection of Animal Species in Meat Products. Food Analytical Methods. 2011;4(3):389-398.

³ Stüber E, Sperner B, Fredriksson-Ahomaa M, Stolle A. Comparison of three commercial test kits for species identification in scalding sausages. Archiv für Lebensmittelhygiene. 2008;59:84-91.



For further information and/or sample ordering please visit our website www.gbo.com or contact us.

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