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**INDUSTRY STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

SN/T 5227.11-2019

**Rapid detection of rat-derived components in exported foods
Recombinase-mediated strand replacement nucleic acid
amplification method (RAA method)
(English Translation)**

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Foreword

SN/T 5227-2019 "Rapid Detection of Animal-derived Components in Exported Foods Recombinase Mediated Strand Replacement Nucleic Acid Amplification Method (RAA Law)" is expected to be divided into the following parts.

--Part 1: Rapid detection of chicken-derived components in exported foods, recombinase-mediated strand replacement nucleic acid amplification method (RAA method);

--Part 2: Rapid detection of pig-derived components in export foods, recombinase-mediated strand replacement nucleic acid amplification method (RAA method);

--Part 3: Rapid detection of sheep-derived components in export foods

recombinase-mediated strand replacement nucleic acid amplification method (RAA method);

--Part 4: Rapid detection of duck-derived components in export foods, recombinase-mediated strand replacement nucleic acid amplification method (RAA method);

--Part 5: Rapid detection of bovine-derived components in exported foods, recombinase-mediated strand replacement nucleic acid amplification method (RAA method);

--Part 6: Rapid detection of buffalo-derived components in exported foods, recombinase-mediated strand replacement nucleic acid amplification method (RAA method);

--Part 7: Rapid detection of horse-derived components in export foods, recombinase-mediated strand replacement nucleic acid amplification method (RAA method);

--Part 8: Rapid detection of donkey-derived components in export foods, recombinase-mediated strand replacement nucleic acid amplification method (RAA method);

--Part 9: Rapid detection of fox-derived components in export foods, recombinase-mediated strand replacement nucleic acid amplification method (RAA method);

--Part 10: Rapid detection of mink-derived components in exported foods, recombinase-mediated strand replacement nucleic acid amplification method (RAA method);

--Part 11: Rapid detection of rat-derived components in exported foods
Recombinase-mediated strand replacement nucleic acid amplification method (RAA method).

This part is part 11 of SN/T 5227-2019.

This part was drafted in accordance with the rules given in GB/T 1.1-2009.

This part is proposed and managed by the General Administration of Customs of the People's Republic of China.

Drafting organizations of this section. Zhengzhou Customs of the People's Republic of China, Zhejiang Food and Drug Inspection and Research Institute, and PLA Control Center, Chinese Academy of Inspection and Quarantine Sciences, Hangzhou Customs of the People's Republic of China, Dalian Customs of the People's Republic of China, People of China Shijiazhuang Customs of the Republic of China, Xiamen Customs of the People's Republic of China, Chengdu Customs of the People's Republic of China, Hangzhou Zhongce Biotechnology Co., Ltd.

1 Scope

This part of SN/T 5227-2019 specifies the RAA detection method for rat-derived components in exported food.

This section applies to the qualitative detection of rat-derived components in exported food.

2 Normative references

The minimum detection limit (LOD) of the method specified in this section is 0.1% (W/W).

The following documents are indispensable for the application of this document. For dated reference documents, only the dated version applies to this article. For undated reference documents, the latest version (including all amendments) is applicable to this document.

GB/T 6682 Analytical laboratory water specifications and test methods GB/T 27403-2008 Laboratory Quality Control Specification Food Molecular Biology Testing

3.1 Terms and definitions

The following terms and definitions apply to this document.

3.1.1

Rat *Rattus norvegicus* Rodents, Muridae, Murine subfamily, the genus *Rattus*, also known as the rat, is the collective name for a variety of rodents. The most common is Malaysia the black rat (also known as the house mouse) and the Chinese brown rat (also known as the *Wistar*).

3.1.2

Real-time RAA

A constant-temperature nucleic acid rapid amplification technology (referred to as RAA technology) that recombinase-mediated strand replacement. Utilize what is obtained from bacteria or fungi Recombinant enzyme, at a constant temperature (usually 37 °C ~ 42 °C), the recombinase can be tightly combined with the primer to form a polymer of the enzyme and the primer.

With the help of the single-stranded DNA binding protein, the double-stranded structure of the template DNA is opened. When the primer is searched on the template DNA, it is completely matched with it.

When matching complementary sequences, under the action of DNA polymerase, new complementary DNA strands are formed, and the amplified products grow exponentially. Use fluorescent with the labeling of the optical probe, as the RAA reaction proceeds, the

RAA product and the increase in the fluorescence signal show a corresponding relationship.

3.1.3

Ct value cycle threshold the number of cycles experienced when the fluorescence signal in each reaction tube reaches the set threshold.

3.1.4

T value time threshold the time required for the fluorescence signal in each reaction tube to reach the set threshold.

3.2 Abbreviations

The following abbreviations apply to this document.

4 Method summary

Using the extracted DNA as a template, the rat-specific detection primers and probes are used for real-time fluorescent RAA amplification.

The increase of light RAA enables the detection and identification of rat components in food and feed.

5 Reagents and materials

Unless otherwise specified, all reagents are analytical reagents or biochemical reagents. The experimental water meets the requirements of GB/T 6682. All reagents are Dispense with DNase-free containers.

Note: See Appendix A for the target gene sequence. F is the upstream primer, R is the downstream primer, P is the probe, FAM-dT, THF, BQH-dT and C3spacer all are probe modification groups.

5.1

CTAB extraction buffer (pH8.0). 10 g/L CTAB, 0.7 mol/L NaCl, 0.05 mol/L Tris-HCl, 0.01 mol/L Na₂EDTA.

5.2

Phenol. Chloroform. Isoamyl alcohol=25.24.1.

5.3

Isopropanol.

5.4 70% ethanol (volume ratio).