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Molecular biomarker analysis — Detection of animal-derived materials in foodstuffs and feedstuffs by real-time PCR

Part 10: Duck DNA detection method

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National foreword

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A list of organizations represented on this committee can be obtained on request to its committee manager.

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ISO/TS 20224-10

**Molecular biomarker analysis —
Detection of animal-derived
materials in foodstuffs and
feedstuffs by real-time PCR —**

**Part 10:
Duck DNA detection method**

*Analyse de biomarqueurs moléculaires — Détection de matériaux
d'origine animale dans les denrées alimentaires et les aliments
pour animaux par PCR en temps réel —*

Partie 10: Méthode de détection de l'ADN de canard

**First edition
2024-02**

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Fraudulent adulteration of meat in food and feed threatens both public safety and commerce. Adulteration can affect those adhering to ethnological dietary rules, economic development and social stability. This document provides a real-time polymerase chain reaction (real-time PCR) analytical method for the identification of meat animal species from nucleic acid present in the ingredients of food and feed.

Animal-derived biological materials in food and feed are detected and identified in the laboratory with the following successive (or simultaneous) steps: preparation of the test portion/sample, nucleic acid extraction and purification, PCR amplification and interpretation of results. This document provides guidance for PCR amplification and interpretation of results, specific to mallard duck (*Anas platyrhynchos*) and spot-billed duck (*Anas zonorhyncha*) DNA detection. Cross detection of white-winged duck (*Asarcornis scutulata*), tufted duck (*Aythya fuligula*), muscovy duck (*Cairina moschata*) and Mandarin duck (*Aix galericulata*) is observed.

The ISO 20224 series consists of technical specifications that describe specific applications. New species DNA detection methods established in the future will be added as independent parts.

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Molecular biomarker analysis — Detection of animal-derived materials in foodstuffs and feedstuffs by real-time PCR —

Part 10: Duck DNA detection method

1 Scope

This document specifies a real-time polymerase chain reaction (real-time PCR) method for the qualitative detection of duck-specific DNA derived from food and feed. It requires the extraction of an adequate amount of PCR amplifiable DNA from the relevant matrix and can be applied to the detection of duck material derived from mallard duck (*Anas platyrhynchos*) and spot-billed duck (*Anas zonorhyncha*). Cross detection of white-winged duck (*Asarcornis scutulata*), tufted duck (*Aythya fuligula*), muscovy duck (*Cairina moschata*) and Mandarin duck (*Aix galericulata*) is observed. Mallard duck and muscovy duck are domesticated poultry for food, while spot-billed duck, white-winged duck, tufted duck and Mandarin duck are wild avian.

The target sequence is a partial fragment of the *Anas platyrhynchos* breed pekin duck isolate CAU_Pekin_2.0 Chr1, whole genome shotgun sequence (i.e. GenBank accession number JACEUM010000001.1),^[1] which is present as a single copy per haploid genome. The provided PCR assay for this target has an absolute limit of detection of five copies per reaction, with ≥ 95 % confidence at this concentration ($LOD_{95\%}$).

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 16577, *Molecular biomarker analysis — Vocabulary for molecular biomarker analytical methods in agriculture and food production*

ISO 20813, *Molecular biomarker analysis — Methods of analysis for the detection and identification of animal species in foods and food products (nucleic acid-based methods) — General requirements and definitions*

ISO 21571, *Foodstuffs — Methods of analysis for the detection of genetically modified organisms and derived products — Nucleic acid extraction*

ISO 24276, *Foodstuffs — Methods of analysis for the detection of genetically modified organisms and derived products — General requirements and definitions*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 16577 apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>