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

Part 9: Goose DNA detection method

bsi.

National foreword

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Partie 9: Méthode de détection de l'ADN d'oie

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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This document was prepared by Technical Committee ISO/TC 34, *Food products*, Subcommittee SC 16, *Horizontal methods for molecular biomarker analysis.*

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Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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Introduction

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 to detect domestic commercial breeds of swan goose (*Anser cygnoides* domesticus) and domestic goose (*Anser anser* domesticus) and interpretation of results. Cross detection of *Anser brachyrhynchus*, *Anser indicus*, *Branta canadensis*, *Cygnus atratus*, *Cygnus buccinator*, *Cygnus cygnus*, *Cygnus olor*, *Nettapus auritus*, *Oxyura jamaicensis* and *Stictonetta naevosa* of Anseriformes is expected. The method can be applied to distinguish domestic goose from domestic chicken, duck and turkey which are most common adulterants of foie gras.[1] The method is also able to differentiate domestic goose from other high-end domestic poultry meats (quail, pigeon, pheasant).

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 9: Goose DNA detection method

1 Scope

This document specifies a real-time polymerase chain reaction (real-time PCR) method for the qualitative detection of goose-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 goose material derived from domestic breeds of swan goose (*Anser cygnoides* domesticus) and domestic goose (*Anser anser domesticus*). Cross detection of *Anser brachyrhynchus*, *Anser indicus*, *Branta canadensis*, *Cygnus atratus*, *Cygnus buccinator*, *Cygnus cygnus*, *Cygnus olor*, *Nettapus auritus*, *Oxyura jamaicensis* and *Stictonetta naevosa* of Anseriformes is expected.

The method can be applied to distinguish domestic breeds of swan goose (*Anser cygnoides domesticus*) and domestic goose (*Anser anser domesticus*) from domestic chicken, duck and turkey which are the most common adulterants of foie gras.[1] It is also able to differentiate the domestic goose from other high-end domestic poultry meats (quail, pigeon, pheasant).

The target sequence is a partial fragment of the *Anser cygnoides* isolate SCWG-2014 breed Sichuan white goose unplaced genomic scaffold, GooseV1.0 scaffold320 (i.e. GenBank accession number NW_025927981.1)[2], 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.

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