International Standard

ISO 17646

First edition
2025-05

Rapid detection of moisture content in fresh meat — Low-field nuclear magnetic resonance (LF-NMR) method

Détection rapide de la teneur en humidité dans la viande fraîche — Méthode par résonance magnétique nucléaire à champ faible

Reference number
ISO 17646:2025(en)

© ISO 2025



COPYRIGHT PROTECTED DOCUMENT

© ISO 2025

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

Page

Foreword ... **iv**

1 Scope ... **1**

2 Normative references ... **1**

3 Terms and definitions ... **1**

4 Principle ... **3**

5 Materials and apparatus ... **3**

6 Preparation of sample ... **3**
6.1 Preparation of testing sample ... 3
6.2 Preparation of standard sample ... 3

7 Low-field nuclear magnetic resonance determination ... **3**
7.1 General parameters ... 3
7.2 Calibration parameters setting ... 4
7.3 Determination parameters setting ... 4
7.4 Determination of blank substrate ... 5
7.5 Determination of testing sample ... 5
7.6 Determination of standard sample and establishment of standard curve ... 5

8 Data processing and moisture content calculation ... **5**
8.1 Data processing ... 5
8.2 Standard curve fitting ... 5
8.3 Expression of results ... 6

9 Test report ... **6**

Annex A (informative) **Preparation of standard sample and standard curve** ... **8**

Annex B (informative) **Interlaboratory test report** ... **10**

Bibliography ... **20**

© ISO 2025 – All rights reserved

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 document 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).

ISO draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). ISO takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, ISO had not received notice of (a) patent(s) which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at www.iso.org/patents. ISO shall not be held responsible for identifying any or all such patent rights.

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 34, *Food products*, Subcommittee SC 6, *Meat, poultry, fish, eggs and their products*.

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.

© ISO 2025 – All rights reserved

Rapid detection of moisture content in fresh meat — Low-field nuclear magnetic resonance (LF-NMR) method

1 Scope

This document specifies requirements for rapid determination of moisture of fresh meat based on low-field nuclear magnetic resonance (LF-NMR) technology.

This document is applicable to the rapid detection of moisture in fresh meat.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

For the purposes of this document, the following terms and definitions 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/

3.1
fresh meat
meat that retains its original compositional and structural properties, and has not been subjected to heating, canning, salting or drying, etc.

[SOURCE: ISO 23722:2021, 3.22]

3.2
transverse relaxation time
T_2
spin-spin relaxation time
time constant when the transverse magnetization vector decreases to 37 % of the maximum value that characterizes the speed of signal attenuation

Note 1 to entry: The relaxation process is the process of the spinning hydrogen nucleus in the static magnetic field returning from the excited state to the equilibrium state. The time required for the relaxation process is called the "relaxation time".

3.3
free induction decay
FID
nuclear magnetic resonance (NMR) signal received, resulting from using a single 90° radio frequency pulse to activate the sample

© ISO 2025 – All rights reserved