
Rice — Evaluation of gelatinization time of kernels during cooking

Riz — Évaluation du temps de gélatinisation lors de la cuisson des grains



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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 14864 was prepared by Technical Committee ISO/TC 34, *Agricultural food products*, Subcommittee SC 4, *Cereals and pulses*.

Annexes A and B of this International Standard are for information only.

© ISO 1998

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from the publisher.

International Organization for Standardization
Case postale 56 • CH-1211 Genève 20 • Switzerland
Internet iso@iso.ch

Printed in Switzerland

Rice — Evaluation of gelatinization time of kernels during cooking

1 Scope

This International Standard specifies a method of evaluating the gelatinization time of rice kernels during cooking.

It is applicable to milled rice as defined in ISO 7301.

2 Normative references

This following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of IEC and ISO editions maintain registers of currently valid International Standards.

ISO 712, *Cereals and cereal products — Determination of moisture content — Routine reference method*.

ISO 7301, *Rice — Specification*.

3 Terms and definitions

For the purposes of this International Standard, the terms and definitions given in ISO 7301 and the following apply.

3.1 gelatinization

hydration process conferring the jelly-like state typical of the coagulated colloids, which are named "gels", on kernels

3.2 gel state

condition reached as a consequence of gelatinization (3.1), when the kernel is fully transparent and absolutely free from whitish and opaque granules after being pressed between two glass sheets

See Figures 1 to 3.

3.3 gelatinization time

time necessary for 90 % of the kernels to pass from their natural state to the gel state (3.2)

4 Principle

The time span is determined between the immersion of the kernels into boiling water and those kernels becoming fully gelatinized, evaluated by visual observation.

5 Apparatus

Usual laboratory apparatus and, in particular, the following.

- 5.1 **Electric plate**, able to maintain a constant temperature of $350\text{ °C} \pm 10\text{ °C}$.
- 5.2 **Beakers**, of borosilicate glass, of capacity 400 ml and diameter 8 cm.
- 5.3 **Perforated spoon**, of stainless steel, with a thermo-insulated handle.
- 5.4 **Glass rod**, about 25 cm long and 5 mm in diameter.
- 5.5 **Round or square glass slides**, about 70 mm in diameter or side length, and 5 mm thickness.
- 5.6 **Balance**, capable of weighing to the nearest 0,01 g.
- 5.7 **Stop clock**.
- 5.8 **Worksurface**, contrasting in colour to rice kernels.
- 5.9 **Sample divider**, conical or multiple-slot sampler with a distribution system.
- 5.10 **Glass balls**, of diameter of 5 mm.

6 Sampling

Sampling is not part of the method specified in this International Standard. A recommended sampling method is given in ISO 13690 [3].

It is important that the laboratory receive a sample which is truly representative and has not been damaged or changed during transport or storage.

7 Preparation of test sample

- 7.1 Carefully mix the laboratory sample to make it as homogeneous as possible.
 - 7.2 Determine the moisture content of the sample according to ISO 712. The acceptable range is a mass fraction of $(13,0 \pm 1,0)\%$.
- If the moisture content is different from the above, condition the sample at ambient temperature and relative humidity until a moisture content within the specified range is obtained.
- 7.3 Reduce the laboratory sample, when necessary, using the sample divider (5.9) to obtain an amount of about 15 g. Discard all kernels with visible embryo (germ) residues and broken grains. Randomly select $(10,0 \pm 0,1)\text{ g}$ from the remaining whole kernels as the test sample.
 - 7.4 Prepare five test samples as described in 7.3.

8 Procedure

- 8.1 Place some glass balls (5.10) into the beaker (5.2). Add 275 ml of deionized water and place it on the electric plate (5.1).
- 8.2 Heat the water until boiling vigorously.
- 8.3 Pour one test sample (7.3) into the beaker, and, at the same time, start the stop clock. Stir with the glass rod (5.4) for a few seconds to prevent the kernels sticking to the bottom of the beaker.