AS 2542.2.1—2007
ISO 5495:2005 and
ISO 5495:2005/Cor.1:2006

Australian Standard®

Sensory analysis

Part 2.1: Specific methods—Paired comparison test

This Australian Standard® was prepared by Committee FT-022, Sensory Analysis. It was approved on behalf of the Council of Standards Australia on 1 May 2007.
This Standard was published on 10 August 2007.

The following are represented on Committee FT-022:

- Australian Associated Brewers
- Australian Food and Grocery Council
- Australian Institute of Food Science and Technology Limited
- Australian Paint Manufacturers' Federation
- Australian Wine and Brandy Corporation
- Deakin University
- Department of Primary Industries and Fisheries Queensland
- Food Science Australia
- Food Technology Association of Victoria
- National Association of Testing Authorities Australia

This Standard was issued in draft form for comment as DR 06040.

Standards Australia wishes to acknowledge the participation of the expert individuals that contributed to the development of this Standard through their representation on the Committee and through the public comment period.

Keeping Standards up-to-date

Australian Standards® are living documents that reflect progress in science, technology and systems. To maintain their currency, all Standards are periodically reviewed, and new editions are published. Between editions, amendments may be issued.

Standards may also be withdrawn. It is important that readers assure themselves they are using a current Standard, which should include any amendments that may have been published since the Standard was published.

Detailed information about Australian Standards, drafts, amendments and new projects can be found by visiting **www.standards.org.au**

Standards Australia welcomes suggestions for improvements, and encourages readers to notify us immediately of any apparent inaccuracies or ambiguities. Contact us via email at **mail@standards.org.au**, or write to Standards Australia, GPO Box 476, Sydney, NSW 2001.

Australian Standard®

Sensory analysis

Part 2.1: Specific methods—Paired comparison test

Originally as AS 2542.2.1—1982.
Second edition 2007.

Published by Standards Australia GPO Box 476, Sydney, NSW 2001, Australia

ISBN 0 7337 8318 X

PREFACE

This Standard was prepared by the Standards Australia Committee FT-022, Sensory Analysis, to supersede AS 2542.2.1—1982, *Sensory analysis of foods*, Part 1: *Specific methods—Paired comparison test*.

This Standard is identical with, and has been reproduced from ISO 5495:2005 and ISO 5495:2005/Cor.1:2006, *Sensory analysis—Methodology—Paired comparison test* and ISO 5495:2005/Cor.1:2006, which has been added at the end of the source text.

The objective of this Standard is to provide a method for comparing the sensory properties of two food samples (paired comparison test).

In reference to Table A.1, the exact p level for α can be calculated using binomial statistics. For example, using Microsoft Excel the p value for α = 1 – BINOMDIST (x–1, n, ½, true) for x responses for sample A from n panellists, where sample A receives more responses than sample B. This calculation applies to a one-tailed test where the panellist is asked which sample (A or B) is greater in the given attribute.

In reference to Table A.2, which discusses the case of a preference test (i.e. which sample do you prefer A or B?) a two-tailed binomial test is required. In this case the p value for α = MIN (1, 2*BINOMDIST (MIN(A1, B1), A1 + B1, ½, TRUE) where 'A1' and 'B1' are the number choosing sample A and sample B, respectively.

In reference to Table A.3, the exact p level for β can be calculated using binomial statistics. For example, using Microsoft Excel the p value for β = BINOMDIST (x, n, p_d + (1 – p_d)*(1/2), TRUE) for x correct responses from n panellists and p_d = maximum allowable proportion of discriminators expressed as decimal, i.e. 10%. = 0.10. Note that for similarity testing you accept the null hypothesis of no difference with 100(1 – β)% confidence.

Hence, if the p value (for β) is equal to 0.05, you conclude that the two samples are similar with 95% confidence.

As this Standard is reproduced from an international standard, the following applies:

(a) Its number appears on the cover and title page while the international standard number appears only on the cover

(b) In the source text 'this International Standard' should read 'this Australian Standard'.

(c) A full point substituted for a comma when referring to a decimal marker.

References to International Standards should be replaced by references to Australian or Australian/New Zealand Standards, as follows:

Reference to International Standard		*Australian Standard*	
ISO		AS	
5492	Sensory analysis—Vocabulary	2542	Sensory analysis of foods
		2542.3	Part 3: Glossary of terms

Where other ISO documents listed as normative references in Clause 2 have not been adopted as Australian Standards.

The terms 'normative' and 'informative' have been used in this Standard to define the application of the appendix to which they apply. A 'normative' appendix is an integral part of a Standard, whereas an 'informative' appendix is only for information and guidance.

CONTENTS

Page

NOTES

AUSTRALIAN STANDARD

Sensory analysis

Part 2.1:
Specific methods—Paired comparison test

1 Scope

This International Standard describes a procedure for determining whether there exists a perceptible sensory difference or a similarity between samples of two products concerning the intensity of a sensory attribute. This test is sometimes also referred to as a directional difference test or a 2-AFC test (Alternative Forced Choice). In fact, the paired comparison test is a forced choice test between two alternatives.

NOTE The paired comparison test is the simplest existing classification test since it concerns only two samples.

The method is applicable whether a difference exists in a single sensory attribute or in several, which means that it enables determination of whether there exists a perceptible difference concerning a given attribute, and the specification of the direction of difference, but it does not give any indication of the extent of that difference. The absence of difference for the attribute under study does not signify that there does not exist any difference between the two products.

This method is only applicable if the products are relatively homogeneous.

The method is effective

a) for determining

   — whether a perceptible difference exists (paired difference test), or

   — whether no perceptible difference exists (paired similarity test) when, for example, modifications are made to ingredients, processing, packaging, handling or storage operations, or

b) for selecting, training and monitoring assessors.

It is necessary to know, prior to carrying out the test, whether the test is a one-sided test (the test supervisor knows a priori the direction of the difference, and the alternative hypothesis corresponds to the existence of a difference in the expected direction) or a two-sided test (the test supervisor does not have any a priori knowledge concerning the direction of the difference, and the alternative hypothesis corresponds to the existence of a difference in one direction or the other).

The paired test can also be used in order to compare two products in terms of preference. The different cases of use of the paired test are summarized in Figure 1.