



JOINT FAO/WHO FOOD STANDARDS PROGRAMME CODEX COMMITTEE ON METHODS OF ANALYSIS AND SAMPLING

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REVIEW OF METHODS OF ANALYSIS IN COMMODITY STANDARDS (FISH AND FISHERY PRODUCTS, FATS AND OILS, CEREALS, PULSES AND LEGUMES AND DERIVED PRODUCTS)

(Prepared by the EWG led by Canada)

Codex Members and Observers wishing to submit comments on the recommendations in this document should do so as instructed in CL 2026/1-MAS available on the Codex webpage/Circular Letters: <https://www.fao.org/fao-who-codexalimentarius/resources/circular-letters/en/>

INTRODUCTION

1. The Codex Secretariat has been amending commodity standards in light of the CCMAS37 (2016) reaffirmation of the decision to have the *Recommended methods of analysis and sampling* (CXS 234-1999) as the single reference for methods of analysis in Codex standards. The methods of analysis in commodity standards have been reviewed as workable packages. Following the completion of each workable package, all methods of analysis in commodity standards should be replaced with a general reference to CXS 234-1999 in accordance with the *Procedural Manual*.
2. The review of the methods of analysis for the fats and oil (FO), cereal, pulses, legumes and derived product (CPL), and fish and fishery product (FFP) workable packages has been completed. During the work of the Codex Secretariat to amend the respective commodity standards, it was identified that:
 - some methods of analysis were not included in the review of CXS 234-1999, but were present in the related commodity standards;
 - methods of analysis in the relevant CPL standards were identified as “to be developed” or “to be determined”; and
 - new methods of analysis for provisions in the *Standards for degermed maize (corn) meal and maize (corn) grits* (CXS 155-1985), and *named vegetable oils* (CXS 210-1999) have been adopted by CAC46 (2023) and have been incorporated in CXS 234 and, as a result of the adoption, confirmation or determination whether the methods of analysis in the commodity standards should be revoked is needed.
3. CCMAS44 discussed the methods that appear in the FO, CPL and FFP commodity standards and how best to address the issues identified by the Codex Secretariat. As there was insufficient time to complete the necessary review of methods, CCMAS44 agreed to establish an electronic working group (EWG) chaired by Canada, working in English only, to consider the methods remaining in the FO, CPL and FFP commodity standards. The EWG was tasked to review the methods in MAS44/CRD02 Rev.1, Appendix III, Tables 1, 2, 6, 7, and 8 (MAS44/CRD02 Rev.1) as part of the update to CXS 234-1999.
4. During the review, the EWG was requested to:
 - determine if the methods of analysis were still fit-for-purpose;
 - review or provide the principle and Typing, or propose numeric performance criteria, if a method of analysis was still fit-for-purpose, so that it could be transferred to CXS 234-1999; or
 - recommend revocation of the methods of analysis from the commodity standard, if the method of analysis was not fit-for-purpose.

5. The EWG was also requested to determine whether methods of analysis could be identified for the entries identified as “to be developed” or “to be determined”.

EWG PROCESS

6. The EWG was initiated and operated through the online Codex forum. The list of participants is presented in Appendix IV.
7. All Codex Members and Observers were welcome and EWG participants were asked to review the proposed methods, method principles and typing. Participants were also welcome to provide comments on proposed methods for consideration by the EWG.
8. In addition, expert advice was sought from Standard Development Organizations (SDOs), requesting information about possible methods to address those provisions identified as “to be developed” or “to be determined”.

RESULTS OF THE EWG CONSULTATION

9. The EWG noted that some methods of analysis identified in MAS44/CRD02 Rev.1, Appendix III Tables 1, 2, 6, 7 and 8 were found in both the commodity standard and CXS 234, and some methods of analysis were only found in the commodity standard.
10. From the responses of the EWG experts, the following observations were made:
 - methods of analysis must have direct pertinence to the Codex standard to which they are directed, but numerical limits are not required; and
 - minor changes are required
 - to some commodity names to ensure that the commodity listed is correlated with the standard, and
 - to some provision names to ensure understanding of why the method is appropriate.
11. Accordingly, as a result of the EWG’s consideration of the methods of analysis identified in MAS44/CRD02 Rev.1, Appendix III Tables 1, 2, 6, 7 and 8, Appendix I to this document has been prepared in two parts. Part 1 lists the amendments and revocations to CXS 234-1999 which the EWG has recommended for consideration by CCMAS45. Part 2 lists the amendments to respective commodity standards, including consequential amendments following consultation with the Codex Secretariat.
12. For some commodities and provisions, the EWG has also recommended methods which have already been listed in CXS 234-1999. The EWG therefore recommends that these methods be retained in CXS 234-1999 with no amendments necessary. These methods are contained in Appendix II.

Methods of analysis in the Standards for peanuts (CXS 200-1995) and oats (CXS 201-1995)

13. During the course of the EWG work, it was noted that there are methods within national standards to address those currently identified as “to be developed” in the *Standard for oats* (CXS 201-1995) or “to be determined” in the *Standard for peanuts* (CXS 200-1995) for the specified provisions. The EWG was hesitant to suggest national regulatory documents as the source of methods owing to concern over citing these types of documents in CXS 234, even with a qualifier that the endorsement is only focused on the method and does not extend to the regulatory aspects.
14. Similarly, a national government was found to provide inspection instructions for peanuts; however, the use of this document would require highlighting appropriate sub-sections of the document which could result in confusion and, as a result, were not proposed.
15. The methods of analysis concerned are listed in Appendix III of the report.

Issues for broader discussion

16. During the review of the fats and oils workable package, the EWG recommended ISO 10539/AOCS Cc 17-95 for the determination of soap content in edible fats and oils not covered by individual standards, and for named animal fats. As this method is already listed for fats and oils (all) in CXS 234-1999, it would not result in an amendment to CXS 234-1999 (see paragraph 12).
17. However, noting the planned efforts to develop an online database for CXS 234-1999, the EWG seeks CCMAS’s consideration if methods of analysis should be presented for each individual commodity instead of being collapsed under a group entry, to enable methods of analysis to be searched efficiently.

CONCLUSION

18. The EWG has fulfilled its terms of reference. However, it could not identify any appropriate internationally validated methods for the provisions as identified in CXS 201-1995 nor CXS 200-1995. Some SDO member bodies have expressed willingness to develop oat methods in the future; however, no methods to address CCMAS' needs related to peanuts were identified.

RECOMMENDATIONS

19. CCMAS45 is invited to:
- consider endorsement of the amendments including revocations to CXS 234-1999 and related commodity standards as recommended in Appendix I;
 - note that the methods of analysis in CXS 234-1999 as contained in Appendix II would not need to be amended following the EWG's consideration of the methods under its terms of reference;
 - consider the best approach for addressing the methods listed in Appendix III; and
 - advise on the presentation of methods of analysis for group entries, as outlined in paragraphs 16-17.

APPENDIX I

PART 1: RECOMMENDED AMENDMENTS AND REVOCATIONS TO CXS 234-1999

Note: recommended additions are indicated in **bold** and underline, and deletion are indicated with ~~strike through~~. The columns 'Codex Standard, Committee' and 'Comments / Recommendations' are included for information and do not form part of the recommended amendments or deletions to CXS 234-1999.

Commodity	Provision	Method	Principle	Type	Codex Standard	Committee	Comments / Recommendations
<u>Fish and Fishery Products</u>							
Crackers from marine and freshwater fish, crustacean and molluscan shellfish	Crude protein	Described in the standard			CXS 222 - 2001	CCFFP	
Crackers from marine and freshwater fish, crustacean and molluscan shellfish	Moisture	Described in the standard			CXS 222 - 2001	CCFFP	
Crackers from marine and freshwater fish, crustacean and molluscan shellfish	Moisture	<u>AOAC 950.46B (air drying)</u>	<u>Gravimetry</u>	<u>!</u>	CXS 222 - 2001	CCFFP	
Raw bivalve molluscs (shucked)	Drained weight	Described in the standard			CXS 292- 2008	CCFFP	
Raw bivalve molluscs (shucked)	Drained weight	<u>AOAC 953.11</u>	<u>Gravimetry</u>	<u>!</u>	CXS 292- 2008	CCFFP)

Quick frozen fish sticks (fish fingers), fish portions and fish fillets—breaded or in batter	Determination of fish content (declaration)—Nitrogen	ISO 937 and see Appendix VI	Titrimetry (Kjeldahl digestion) and calculation	II	CXS 166–1989	CCFFP	Endorsed at CCMAS44 (2025)
Quick frozen fish sticks (fish fingers), fish portions and fish fillets—breaded or in batter	Determination of fish content (declaration)—Moisture	ISO 1442 and see Appendix VI	Gravimetry and calculation	I	CXS 166–1989	CCFFP	Endorsed at CCMAS44 (2025)
Quick frozen fish sticks (fish fingers), fish portions and fish fillets—breaded or in batter	Determination of fish content (declaration)—Total fat	ISO 1443 and see Appendix VI	Gravimetry and calculation	I	CXS 166–1989	CCFFP	Endorsed at CCMAS44 (2025)
Quick frozen fish sticks (fish fingers), fish portions and fish fillets—breaded or in batter	Determination of fish content (declaration)—Ash	ISO 1443 and see Appendix VI	Gravimetry and calculation	I	CXS 166–1989	CCFFP	Endorsed at CCMAS44 (2025)
<u>Quick frozen fish sticks (fish fingers), fish portions and fish fillets—breaded or in batter</u>	<u>Determination of fish content (declaration) – Nitrogen</u>	<u>ISO 937 and</u>	<u>Calculation from</u>	<u>I</u>	<u>CXS 166–1989</u>	<u>CCFFP</u>	<u>Endorsed at CCMAS44 (2025)</u>
	<u>Moisture</u>	<u>ISO 1442 and</u>	<u>Titrimetry (Kjeldahl digestion) and gravimetry</u>				
	<u>Total fat</u>	<u>ISO 1443 and</u>					

<u>Ash</u>		<u>ISO 936</u>					
<u>Fats and oils</u>							
<u>Edible</u> Fats and oils not covered by individual standards	Acidity: acid value	ISO 660 / AOCS Cd 3d-63	Titrimetry	I	CXS 19-1981	CCFO	Update the commodity title in CXS 234 to be consistent with CXS 19-1981
<u>Edible</u> Fats and oils not covered by individual standards	Copper and iron	AOAC 990.05 / ISO 8294 / AOCS Ca 18b-91	Atomic absorption spectrophotometry (direct graphite furnace)	II	CXS 19-1981	CCFO	Update the commodity title in CXS 234 to be consistent with CXS 19-1981
<u>Edible</u> Fats and Oils not Covered by Individual Standards	Peroxide Value	ISO 3961:1998	Titrimetry (colorimetric)		CXS 19-1981	CCFO	ISO 3961 is for determination of iodine value
<u>Edible</u> Fats and Oils not Covered by Individual Standards	Peroxide Value	<u>AOCS Cd 8b-90 / ISO 3960 / NMKL 158</u>	<u>Titrimetry</u>	<u>I</u>	CXS 19-1981	CCFO	AOCS Cd 8b-90 / ISO 3960 / NMKL 158 is consistent with CXS 234 for Named Vegetable Oils
Fats and Oils not Covered by Individual Standards	Soap content	BS 684 Section 2.65			CXS 19-1981	CCFO	BS 684-2.5 has been superseded by ISO 10539 / AOCS Cc 17-95 (determination of soap).
Named animal fats	Fatty acid composition	ISO 5508: 1995/ 5509: 1999			CXS 211-1999	CCFO	ISO 5508: 1995/ 5509: 1999 have been withdrawn
Named animal fats	Fatty acid composition	<u>AOCS Ce 2-66 and AOCS Ce 1j-07</u>	<u>Preparation of methyl esters and GC-FID</u>	<u>II</u>	CXS 211-1999	CCFO	AOCS Ce 2-66 and AOCS Ce 1j-07 and ISO 12966-2 and ISO 12966-4

Named animal fats	Fatty acid composition	ISO 12966-2 and ISO 12966-4	Preparation of methyl esters and <u>gas chromatography GC-FID</u>	III	CXS 211-1999	CCFO	ISO 12966-4 is a general temperature program method for all FAME
Named animal fats	Soap content	BS 684 Section 2.5			CXS 211-1999	CCFO	BS 684-2.6 has been superseded by ISO 10539 (determination of soap).
Fat Spreads and Blended Spreads	<u>Milk fat content (Butyric acid)</u>	AOAC 990.27; AOCS Ca 5c-87 (97)			CXS 256-1999	CCFO	CXS 256-1999 defined determination of milk fat content (Butyric acid) because Butyric acid is a naturally occurring short-chain saturated fatty acid in the milk fat of cows and other ruminants but not in animal adipose or vegetable fats – identifies source of fat. The conversion factor to milk fat is user-defined since butyric acid content can be variable. AOAC 990.27 / AOCS Ca 5c-87 both use a packed GC column.
Fat Spreads and Blended Spreads	<u>Milk fat content (Butyric acid)</u>	<u>AOAC 2012.13 / ISO 16958 IDF 231</u>	<u>GC-FID and calculation</u>	I	CXS 256-1999	CCFO	NOTE AOCS Ca 5e-13 uses a capillary column for determination of butyric acid but has not been fully validated.
Fat Spreads and Blended Spreads	Salt content	IDF 12B: 1988, ISO CD 1738 or AOAC 960.29.			CXS 256-1999	CCFO	
Fat Spreads and Blended Spreads	Salt content	AOAC 960.29 / ISO 1738 IDF 12			CXS 256-1999	CCFO	
Fat Spreads and Blended Spreads	Salt content	<u>ISO 15648 IDF 179</u>	<u>Titrimetry (Potentiometric)</u>	II	CXS 256-1999	CCFO	

Fat Spreads and Blended Spreads	Salt content	<u>AOAC 2016.03 / ISO 21422 IDF 242</u>	<u>Titrimetry (Potentiometric)</u>	<u>III</u>			
Fat Spreads and Blended Spreads	Vitamin A	AOAC 985.30; AOAC 992.04; or AOAC 1980, 63, 4	HPLC HPLC		CXS 256-1999	CCFO	AOAC 985.30 is a method for <i>sampling</i> . AOAC 992.04 is validated for milk and milk-based infant formula
Fat Spreads and Blended Spreads	Vitamin A	<u>EN 12823</u>	<u>HPLC-UV detection</u>	<u>II</u>	CXS 256-1999	CCFO	EN 12823 validated in margarine
Fat Spreads and Blended Spreads	Vitamin D	AOAC 981.17	HPLC		CXS 256-1999	CCFO	AOAC 981.17 was repealed in 2007
Fat Spreads and Blended Spreads	Vitamin D	<u>EN 12821 / NMKL 167</u>	<u>HPLC-UV</u>	<u>II</u>	CXS 256-1999	CCFO	EN 12821 / NMKL 167, validation in margarine
Fat Spreads and Blended Spreads	Vitamin E	ISO 9936:1997	<u>HPLC-UV detection</u>	<u>II III</u>	CXS 256-1999	CCFO	These products may include dairy ingredients (milk fat) but are not milk products per se, so ISO 9936 is considered applicable
Fat Spreads and Blended Spreads	Vitamin E	<u>EN 12822</u>	<u>HPLC- UV detection</u>	<u>II</u>	CXS 256-1999	CCFO	EN 12822 is validated for margarine
Named vegetable oils	Fatty acid composition	ISO 5509: 2000			CXS 210-1999	CCFO	ISO 5509 withdrawn by SDO and replaced by ISO 12966 series.
Named vegetable oils	Fatty acid composition	AOCS Ce 2-66 and AOCS Ce 1h-05	<u>Preparation of methyl esters and GC-FID</u>	<u>II</u>	CXS 210-1999	CCFO	AOCS Ce 1h-05 was specifically developed for the isothermal separation of cis/trans FAME prepared from vegetable oils.
Named vegetable oils	Fatty acid composition	<u>ISO 12966-2 and ISO 12966-4</u>	<u>Preparation of methyl esters and GC-FID</u>	<u>III</u>	CXS 210-1999	CCFO	

ISO 12966-4 is a general temperature program method for all FAME.

Cereals, Pulses, Legumes and Derived Products

Maize (corn)	Broken kernels	ISO 5223-1983	<u>Gravimetry - Sieving (4.5 mm round aperture sieve)</u>	!	CXS 153-1985	CCCPL
Sorghum grains	Fibre, crude	ICC 113 / ISO 6541	<u>Gravimetry (separation, incineration)</u>	!	CXS 172-1989	CCCPL
Rice	Head rice	ISO 7301 (Annex A)	<u>Visual examination, length, gravimetry</u>	!	CXS 198-1995	CCCPL
Rice	Large broken kernel	ISO 7301 (Annex A)	<u>Visual examination, length, gravimetry</u>	!	CXS 198-1995	CCCPL
Rice	Medium broken kernel	ISO 7301 (Annex A)	<u>Visual examination, length, gravimetry</u>	!	CXS 198-1995	CCCPL
Rice	Small broken kernel	ISO 7301 (Annex A)	<u>Visual examination, length, sieving, gravimetry</u>	!	CXS 198-1995	CCCPL
Rice	Chips	ISO 7301 (Annex A)	<u>Sieving, gravimetry</u>	!	CXS 198-1995	CCCPL
Rice	Heat-damaged kernels	ISO 7301 (Annex A)	<u>Visual examination, gravimetry</u>	!	CXS 198-1995	CCCPL
Rice	Damaged kernels	ISO 7301 (Annex A)	<u>Visual examination, gravimetry</u>	!	CXS 198-1995	CCCPL
Rice	Immature kernels	ISO 7301 (Annex A)	<u>Visual examination, gravimetry</u>	!	CXS 198-1995	CCCPL
Rice	Chalky kernels	ISO 7301 (Annex A)	<u>Visual examination, gravimetry</u>	!	CXS 198-1995	CCCPL
Rice	Red kernels	ISO 7301 (Annex A)	<u>Visual examination, gravimetry</u>	!	CXS 198-1995	CCCPL
Rice	Red-streaked kernels	ISO 7301 (Annex A)	<u>Visual examination, gravimetry</u>	!	CXS 198-1995	CCCPL

Rice	Pecks	ISO 7301 (Annex A)	<u>Visual examination, gravimetry</u>	!	CXS 198-1995	CCCPL	
Rice	Maximum recommended levels of other types of rice	ISO 7301 (Annex A)	<u>Visual examination, gravimetry</u>	!	CXS 198-1995	CCCPL	
Wheat and durum wheat	Minimum test weight	ISO 7971	<u>Gravimetry (in 20 L)</u>	!	CXS 199-1995	CCCPL	Mass per hectolitre (100 L) – ratio of the mass of a cereal to the volume it occupies
Wheat and durum wheat	Shrunken and broken kernels	ISO 5223	<u>Sieving</u>	!	CXS 199-1995	CCCPL	
Wheat and durum wheat	Edible grains other than wheat and durum wheat	ISO 7970 (Annex C)	<u>Sieving and gravimetry</u>	!	CXS 199-1995	CCCPL	
Wheat and durum wheat	Damaged kernels	ISO 7970 (Annex C)	<u>Sieving and gravimetry</u>	!	CXS 199-1995	CCCPL	
Wheat and durum wheat	Insect bored kernels	To be developed <u>ISO 7970 (Annex C/D)</u>	<u>Visual examination and gravimetry</u>	!	CXS 199-1995	CCCPL	<p>May be covered by “grain attacked by pests - grain that shows damage owing to an attack by rodents, insects, mites or other pests”</p> <p>OPTION 1: As CCCPL is now identified as an active committee, a request could be sent to CCCPL to establish whether the provision should be changed to ‘Grain attacked by pests’ and if yes, would the CXS 199 specifications still be applicable?</p> <p>OPTION 2: Is it possible to visually identify and segregate the grain with insect bored kernels from those attacked by rodents, mites or other pests? If yes, an adaptation of ISO 7970 text may be required for the existing</p>

						provision and specification. Is this a possibility?
Wheat and Durum wheat	Edible grains other than wheat and durum wheat	<u>ISO 11051 (Annex A)</u>	<u>Sieving and gravimetry</u>	!	CXS 199-1995	CCCPL
Wheat and Durum wheat	Damaged kernels	<u>ISO 11051 (Annex A)</u>	<u>Sieving and gravimetry</u>	!	CXS 199-1995	CCCPL
Wheat and Durum wheat	Insect bored kernels	<u>ISO 11051 (Annex A)</u>	<u>Visual examination and gravimetry</u>	!	CXS 199-1995	CCCPL
						May be covered by "grain attacked by pests - grain that shows damage owing to an attack by rodents, insects, mites or other pests" As above
Oats	Minimum test weight	ISO 7971	<u>Gravimetry (in 20 L)</u>	!	CXS 201-1995	CCCPL
						Mass per hectolitre (100 L) – ratio of the mass of a cereal to the volume it occupies

PART 2: RECOMMENDED AMENDMENTS TO COMMODITY STANDARDS

Note: Recommended additions are indicated in **bold and underline**, and deletion are indicated with ~~strike through~~

STANDARD FOR NAMED VEGETABLE OILS (CXS 210-1999)**8. METHODS OF ANALYSIS AND SAMPLING**

For checking the compliance with this standard, the methods of analysis and sampling contained in the *Recommended methods of analysis and sampling* (CXS 234-1999)ⁱ relevant to the provisions in this standard, shall be used.

8.1 Determination of GLC ranges of fatty acid composition

According to ISO 5509:2000.

STANDARD FOR CRACKERS FROM MARINE AND FRESHWATER FISH, CRUSTACEAN AND MOLLUSCAN SHELLFISH (CXS 222-2001)**7.3 Analysis**

For checking the compliance with this standard, the methods of analysis and sampling contained in CXS 234- 1999 relevant to the provisions in this standard shall be used.

7.3.1 Determination of crude protein

According to AOAC 920.87 or 960.52.

7.3.2 Determination of moisture

According to AOAC 950.46B (air drying).

STANDARD FOR LIVE AND RAW BIVALVE MOLLUSCS (CXS 292-2008)**17.3 Analysis**

For checking the compliance with this standard, the methods of analysis and sampling contained in *Recommended methods of analysis and sampling* relevant to the provisions in this standard shall be used

17.3.1 Determination of drained weight

In the case of shucked bivalve molluscs, the drained weight shall be determined according to AOAC International official method 953.11.

STANDARD FOR MAIZE (CORN) (CXS 153-1985)**8. METHODS OF ANALYSIS AND SAMPLING**

For checking the compliance with this Standard, the methods of analysis and sampling contained in the Recommended Methods of Analysis and Sampling (CXS 234-1999) relevant to the provisions in this Standard shall be used.

ANNEX

In those instances where more than one factor limit and/or method of analysis is given we strongly recommend that users specify the appropriate limit and method of analysis.

Factor/Description	Limit	Method of analysis
DEFECTS		
▪ blemished grains: grains which are insect or vermin damaged, stained, diseased, discoloured, germinated, frost damaged, or otherwise materially damaged	MAX: 7.0% of which diseased grains must not exceed 0.5%	Visual Examination
▪ broken kernels	MAX: 6.0%	ISO 5223-1983 (4.50 mm metal sieve) <u>Refer to Section 8</u>
▪ other grains	MAX: 2.0%	Visual Examination

STANDARD FOR SORGHUM GRAINS (CXS 172-1989)**8. METHODS OF ANALYSIS AND SAMPLING**

For checking the compliance with this standard, the methods of analysis and sampling contained in the *Recommended methods of analysis and sampling* (CXS 234-1999)ⁱⁱ relevant to the provisions in this standard shall be used.

ANNEX

In those instances where more than one factor limit and/or method of analysis is given, we strongly recommend that users specify the appropriate limit and method of analysis.

CRUDE FIBRE	Buyer preference	ICC-113 Determination of crude fibre value (Type I) — or — ISO 6541 (1981) Agricultural food products determination of crude fibre content modified Scharrer method <u>Refer to Section 8</u>
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STANDARD FOR RICE (CXS 198-1995)**8. METHODS OF ANALYSIS AND SAMPLING**

For checking the compliance with this standard, the methods of analysis and sampling contained in the *Recommended Methods of Analysis and Sampling* (CXS 234-1999) relevant to the provisions in this standard, shall be used.

ANNEX

Factor/Description		Limit				Method of analysis
4.	OTHER QUALITY FACTORS In those instances where more than one factor limit and/or method of analysis is given it is strongly recommended that users specify the appropriate limit and method of analysis.					
4.1	Whole Kernel is a kernel without any broken part.					
4.1.1	Head Rice is a kernel, the length of which is equal to or greater than three quarters of the average length of the corresponding whole kernel.	buyer preference				ISO 7301 (Annex A) Refer to Section 8
4.1.2	Large Broken Kernel are fragments of kernel, the length of which is less than three-quarters but greater than one-half of the average length of a corresponding whole kernel.	buyer preference				ISO 7301 (Annex A) Refer to Section 8
4.1.3	Medium Broken Kernel are fragments of kernel, the length of which is equal to or less than one-half but greater than one-quarter of the average length of a corresponding whole kernel.	buyer preference				ISO 7301 (Annex A) Refer to Section 8
4.1.4	Small Broken Kernel are fragments of kernel, the length of which is equal to or less than one-quarter of the average length of a corresponding whole kernel but which does not pass through a metal sieve with round perforation 1.4 mm in diameter.	buyer preference				ISO 7301 (Annex A) Refer to Section 8
4.1.5	Chips are fragments of kernel which pass through a metal sieve with round perforations 1.4 mm in diameter.	0.1% m/m				ISO 7301 (Annex A) Refer to Section 8
4.2	Defective Kernels	Husked Rice	Milled Rice	Husked Parboiled Rice	Milled Parboiled Rice	

4.2.1	Heat-Damaged Kernels are kernels, whole or broken, that have changed their normal colour as a result of heating. This category includes whole or broken kernels that are yellow due to alteration. Parboiled rice in a batch of non-parboiled rice is also included in this category.	4.0% m/m*	3.0% m/m	8.0% m/m*	6.0% m/m	ISO 7301 (Annex A) <u>Refer to Section 8</u>
4.2.2	Damaged Kernels are kernels, whole or broken, showing obvious deterioration due to moisture, pests, diseases, or other causes, but excluding heat-damaged kernels.	4.0% m/m	3.0% m/m	4.0% m/m	3.0% m/m	ISO 7301 (Annex A) <u>Refer to Section 8</u>
4.2.3	Immature Kernels are unripe and/or undeveloped whole or broken kernels.	12.0% m/m	2.0% m/m	12.0% m/m	2.0% m/m	ISO 7301 (Annex A) <u>Refer to Section 8</u>
4.2.4	Chalky Kernels are whole or broken kernels except for glutinous rice, of which at least three-quarters of the surface has an opaque and floury appearance.	11.0% m/m*	11.0% m/m	N/A	N/A	ISO 7301 (Annex A) <u>Refer to Section 8</u>
4.2.5	Red Kernels are whole or broken kernels with a red-coloured pericarp covering more than one-quarter of their surface.	12.0% m/m	4.0% m/m	12.0% m/m	4.0% m/m	ISO 7301 (Annex A) <u>Refer to Section 8</u>
4.2.6	Red-Streaked Kernels are kernels, whole or broken, with red streaks, the lengths of which may be equal to or greater than one-half of that of the whole kernel, but the surface area covered by these red streaks shall be less than one-quarter of the total surface.	N/A	8.0% m/m	N/A	8.0% m/m	ISO 7301 (Annex A) <u>Refer to Section 8</u>
4.2.7	Pecks are whole or broken kernels of parboiled rice of which more than one-quarter of the surface is dark brown or black in colour.	N/A	N/A	4.0% m/m*	2.0% m/m	ISO 7301 (Annex A) <u>Refer to Section 8</u>
4.3	Maximum Recommended Levels of Other Types of Rice					ISO 7301 (Annex A) <u>Refer to Section 8</u>
	Paddy Rice Husked Rice Milled Rice Glutinous Rice	2.5% m/m N/A N/A 1.0% m/m	0.3% m/m 1.0% m/m N/A 1.0% m/m	2.5% m/m N/A 2.0% m/m 1.0% m/m	0.3% m/m 1.0% m/m% 2.0% m/m% 1.0% m/m	

STANDARD FOR WHEAT AND DURUM WHEAT (CXS 199-1995)**8. METHODS OF ANALYSIS AND SAMPLING**

For checking the compliance with this standard, the methods of analysis and sampling contained in the *Recommended Methods of Analysis and Sampling* (CXS 234-1999) relevant to the provisions in this standard, shall be used.

ANNEX

In those instances where more than one factor limit and/or method of analysis is given it is strongly recommended that users specify the appropriate limit and method of analysis.

Factor/Description	Limit		Method of analysis
	Wheat	Durum Wheat	
1. Minimum test weight: the weight of a hundred litre volume expressed in kilograms per hectolitre.	68	70	The test weight shall be the weight per ISO 7971-1986 expressed in kilograms per hectolitre as determined on a test portion of the original sample. <u>Refer to Section 8</u>
2. Shrunken and broken kernels: broken or shrunken wheat or durum wheat which will pass through a 1.7 mm x 20 oblong-holed metal sieve for wheat and through a 1.9 mm x 20 oblong-holed metal sieve for durum wheat.	5.0% m/m max	6.0% m/m max	ISO 5223-1983 "Test sieves for cereals". <u>Refer to Section 8</u>
3. Edible Grains other than wheat and durum wheat (whole or identifiably broken)	2.0% m/m max	3.0% m/m max	ISO 7970-1987: (Annex C) <u>Refer to Section 8</u>
4. Damaged kernels (including pieces of kernels that show visible deterioration due to moisture, weather, disease, mould, heating, fermentation, sprouting, or other causes.)	6.0% m/m max	4.0% m/m max	ISO 7970-1987: (Annex C) <u>Refer to Section 8</u>

5. Insect bored kernels: kernels which have been visibly bored or tunnelled by insects	1.5% m/m	2.5% m/m	To be developed <u>Refer to Section 8</u>
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STANDARD FOR DEGERMED MAIZE (CORN) MEAL AND MAIZE (CORN) GRITS (CXS 155-1985)

8 METHODS OF ANALYSIS AND SAMPLING

For checking the compliance with this standard, the methods of analysis and sampling contained in the *Recommended methods of analysis and sampling* (CXS 234-1999)ⁱⁱⁱ relevant to the provisions in this standard, shall be used.

ANNEX

In those instances where more than one factor limit and/or method of analysis is given, we strongly recommend that users specify the appropriate limit and method of analysis.

Factor/Description	Limit	Method of analysis
ASH	Max: 1.0% on a dry weight basis	Refer to Section 8
PROTEIN (N x 6.25)	Min: 7.0% on a dry weight basis	According to ISO 1871:1975. <u>Refer to Section 8.</u>
CRUDE FAT	Max: 2.25% on a dry weight basis	According to ISO 5986:1983. <u>Refer to Section 8.</u>

STANDARD FOR OATS (CXS 201-1995)**8. METHODS OF ANALYSIS AND SAMPLING**

For checking the compliance with this standard, the methods of analysis and sampling contained in the *Recommended Methods of Analysis and Sampling* (CXS 234-1999) relevant to the provisions in this standard, shall be used.

ANNEX

In those instances where more than one factor limit and/or method of analysis is given it is strongly recommended that users specify the appropriate limit and method of analysis.

Factor/Description	Limit	Method of analysis
1 Minimum test weight: At least 46 kg/hl The weight of a hundred litre volume of oats expressed as kilograms per hectolitre.	At least 46 kg/hl	The test weight shall be the weight per ISO 7971-1986 or any other equipment giving equivalent results expressed as kilograms per hectolitre as determined on a test portion of the original sample <u>Refer to Section 8</u>

APPENDIX II

METHODS RECOMMENDED TO BE RETAINED IN CXS 234-1999 WITH NO AMENDMENTS NEEDED

Commodity	Provision	Method	Principle	Type	Codex Standard	Committee	Comments
Crackers from marine and freshwater fish, crustacean and molluscan shellfish	Crude protein	AOAC 2001.11	Titrimetry (Kjeldahl Digestion)	IV	CXS 222-2001	CCFFP	AOAC 920.87 and AOAC 960.52 recommended to be replaced with AOAC 2001.11. This method has been endorsed by CCMAS43 (2024)
Fats and oils (all)	Soap content	ISO 10539 / AOCS Cc 17-95	Titrimetry	I	The relevant standards under consideration are CXS 19-1981 and CXS 211-1999.	CCFO	BS 684-2.6 has been superseded by ISO 10539 (determination of soap). BS 684-2.5 has been superseded by ISO 10539 / AOCS Cc 17-95 (determination of soap).
Degermed maize (corn) meal and maize (corn) grits	Protein (N x 6.25)	ICC 105/2 and ICC 110/1	Calculation from moisture and Titrimetry (Kjeldahl digestion)	I	CXS 155-1985	CCCPL	Revoke the method ISO 1871:1975 found in CXS 155-1985 ICC methods adopted by CAC46 (present in current CXS 234)
Degermed maize (corn) meal and maize (corn) grits	Crude fat	AOAC 945.38F and 920.39C and ICC 110/1	Calculation from moisture and Gravimetry (ether extraction)	I	CXS 155-1985	CCCPL	Revoke the method ISO 5986:1983 found in CXS 155-1985 Methods adopted by CAC46 (present in current CXS 234)

APPENDIX III

PROVISIONS FOR WHICH THE EWG WAS UNABLE TO RECOMMEND METHODS, PRINCIPLES AND TYPING

Commodity	Provision	Method	Principle	Type	Codex Standard	Committee	Comments
Oats	Hull-less and broken kernels	To be developed			CXS 201-1995	CCCPL	
Oats	Edible grains other than oats	To be developed			CXS 201-1995	CCCPL	
Oats	Damaged kernels	To be developed			CXS 201-1995	CCCPL	
Oats	Wild oats	To be developed			CXS 201-1995	CCCPL	
Oats	Insect bored kernels	To be developed			CXS 201-1995	CCCPL	
Oats	Blemished grains	To be developed			CXS 201-1995	CCCPL	
Peanuts	In-pod defects: Empty pods	To be determined			CXS 200-1995	CCCPL	NOTE: ISO 6478 withdrawn
Peanuts	In-pod defects: Damaged pods	To be determined			CXS 200-1995	CCCPL	
Peanuts	In-pod defects: Discoloured pods	To be determined			CXS 200-1995	CCCPL	
Peanuts	Kernel defects: Damaged kernels	To be determined			CXS 200-1995	CCCPL	
Peanuts	Kernel defects: Discoloured kernels	To be determined			CXS 200-1995	CCCPL	

Commodity	Provision	Method	Principle	Type	Codex Standard	Committee	Comments
Peanuts	Kernel defects: Broken and split kernels	To be determined			CXS 200-1995	CCCPL	
Peanuts	Peanuts other than the designated type	To be determined			CXS 200-1995	CCCPL	

Appendix IV

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