CODEX ALIMENTARIUS COMMISSION E

Food and Agriculture Organization of the United Nations

World Health Organization

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JOINT FAO/WHO FOOD STANDARDS PROGRAMME

CODEX COMMITTEE ON FOOD ADDITIVES

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PROPOSED DRAFT REVISION OF THE CODEX *STANDARD FOR FOOD GRADE SALT* (CODEX STAN 150-1985)

(N08-2010)

Prepared by the EWG on Food Grade Salt

Governments and international organizations in Observer status with the Codex Alimentarius Commission wishing to submit comments at Step 3 on proposed draft revised Standard for Food Grade Salt (see Annex 1 to this document) are invited to do so **no later than 31 January 2011** as follows: Secretariat, Codex Committee on Food Additives, National Institute of Nutrition and Food Safety, China CDC, 7 Panjiayuan Nanli, Chaoyang District, Beijing 100021, China (Telefax: + 86 10 67711813, E-mail: secretariat@ccfa.cc ***preferably***), with a copy to the Secretary, Codex Alimentarius Commission, Joint FAO/WHO Food Standards Programme, Viale delle Terme di Caracalla, 00153 Rome, Italy (Telefax: +39.06.5705.4593; E-mail: Codex@fao.org - ***preferably***).

INTRODUCTION

1. The Electronic Working Group on the Revision of the Codex Standard for Food Grade Salt (EWG on Food Grade Salt), chaired by Switzerland, had the following members: Brazil, The Dominican Republic, Egypt, Hungary, Indonesia, Jamaica, Japan, Kenya, Lebanon, Malaysia, Norway, Papua New Guinea, The United States of America, Vietnam, CEFIC (European Chemical Industry Council) and EuSalt (European Salt Producers' Association).

2. At its 42nd session, the Codex Committee on Food Additives (CCFA) considered under Agenda item 11 a *Discussion paper*[1] *on the Codex Standard for Food Grade Salt* (CODEX STAN 150-1985) prepared by Switzerland that contained an analysis of the current Standard for food grade salt and in which amendments to several sections for the standard were proposed. "The Committee agreed to start new work on the revision of the Standard and emphasised the need to focus the revision only on the areas that had been identified in the document, i.e. the sections on additives, contaminants, hygiene and methods of analysis and sampling without reopening discussion on other sections." (Also refer to ALINORM 10/33/12, paragraphs 165- 167).

3. The Codex Alimentarius Commission approved this new work at its 33rd session (Geneva, Switzerland, 5th - 9th July 2010).

4. The Proposed Revised Draft Standard in **Annex 1** has been developed taking into account the comments submitted in response to the Discussion Paper (CX/FA 10/42/18 Add.1: Comments from Brazil, Iran, Libya, Kenya and South Africa) and CRD 17: Comments from Indonesia, Mali, Thailand and EuSalt) and in response a first draft circulated by Switzerland to the members of the WG on 14th September 2010. Additional comments were provided by the United States of America and EuSalt.

[1] CX/FA 10/42/18

5. The following paragraphs provide explanations for the proposed changes:

SECTION 4: FOOD ADDITIVES

6. The current Section 4.1 on the required food grade quality of food additives addresses principles that are already covered by the Preamble to the General Standard for Food Additives (GSFA). It is therefore proposed to delete this redundant section from the Standard.

SECTION 5: CONTAMINANTS

7. The current Standard on food grade salt provides maximum levels for five contaminants, of which four (cadmium, lead, mercury and arsenic) are already addressed by the Codex *General Standard for Contaminants and Toxins in Foods (GSCTF)* (CODEX STAN 193-1995). As the levels for these four contaminants are the same in the GSCTF, the aforementioned contaminants can be deleted from the Standard on food grade salt.

8. In line with the general format for commodity standards laid down in the Codex Procedural Manual, it is proposed to replace the current section 5 of the Standard on food grade salt as follows:

5. CONTAMINANTS

The products covered by this Standard shall comply with the Maximum Levels of the Codex General Standard for Contaminants and Toxins in Foods (CODEX STAN 193-195) established by the CAC.

9. The fifth contaminant is copper for which there is no entry in the GSCTF since copper is also a micronutrient and its levels in food are considered to reflect quality aspects rather than safety issues. The level of 2 mg/kg expressed as Cu will not be "harmful to the health of the consumer" since the PMTDI of 0.05-0.5 mg/kg bw for copper that was confirmed by JECFA in 1982 (26^{th} meeting) would be equivalent to the intake of 15 kg of food grade salt by an adult. Assuming a daily consumption of 10 g of salt per head, the contribution of copper to the total intake would be insignificant.

10. The presence of copper as a contaminant may result from the use of copper-based equipment in salt production. The proposed limit shall not mitigate a possible hazard but ensure that the manufacturing process and the quality of the produced salt are appropriate. Therefore, the copper limit would best be addressed under Section 3: Essential Composition and Quality Factors.

11. Therefore, Section 3.2 of the Standard should be amended by inserting the following sentence at the end of the section:

3.2 Naturally present secondary products and contaminants

Copper shall not exceed 2 mg/kg (expressed as Cu).

SECTION 6: FOOD HYGIENE

12. In line with the general format for commodity standards laid down in the Codex Procedural Manual, it is proposed to replace the current section 6: Food Hygiene of the Standard on food grade salt as follows:

6. FOOD HYGIENE

13. **It is recommended that the products covered by the provisions of this standard be prepared and handled in accordance with the appropriate sections of the *Recommended International Code of Practice – General Principles of Food Hygiene* (CAC/RCP 1-1969), and other relevant Codex texts such as Codes of Hygienic Practice and Codes of Practice.**

SECTION 9: METHODS OF ANALYSIS AND SAMPLING

14. The appendix to the Standard provides a method for sampling of food grade salt in order to determine sodium chloride. This appendix reflects current practices and is needed for internationally traded food grade salt.

15. The current appendix refers to a document ("Instructions on Codex Sampling Procedures – CX/MAS 1-1987") that has never been adopted by the CAC. It is more appropriate to refer instead to the *General Guidelines on Sampling* (CAC/GL 50-2004).

16. The references to the analytical methods should be updated in order to refer to the current valid methods available from international organisations. In addition several available EuSalt-methods should be added to the current methods in section 9 as employed apparatus are common in many laboratories nowadays. However, as some laboratories may not have the necessary equipment, it would be worthwhile to include current and older practices in the methods of analysis.

17. It is also recommended to refer to the iodine titration method that is included in the relevant WHO guidance document (*Assessment of iodine deficiency disorders and monitoring their elimination. A guide for programme managers. Third edition, Annex 1: Titration method for determining salt iodate and salt iodine content. World Health Organisation, Geneva, 2007.*).

TYPING ERRORS (IN OTHER SECTIONS)

18. The following typing errors should be corrected:

Section 8.1: 4th line: New: “from” instead of “form”

Section 8.3: 2nd line: New: “should” instead of “Should”

ANNEX 1

PROPOSED DRAFT REVISED CODEX *STANDARD FOR FOOD GRADE SALT*
(CX STAN150-1985)[2]

(N08-2010)

(The proposed changes are underlined)

1. SCOPE

This standard applies to salt used as an ingredient of food, both for direct sale to the consumer and for food manufacture. It applies also to salt used as a carrier of food additives and/or nutrients. Subject to the provisions of this standard more specific requirements for special needs may be applied. It does not apply to salt from origins other than those mentioned in Section 2, notably the salt which is a by-product of chemical industries.

2. DESCRIPTION

Food grade salt is a crystalline product consisting predominantly of sodium chloride. It is obtained from the sea, from underground rock salt deposits or from natural brine.

3. ESSENTIAL COMPOSITION AND QUALITY FACTORS

3.1 Minimum NaCl content

The content of NaCl shall not be less than 97% on a dry matter basis, exclusive of additives.

3.2 Naturally present secondary products and contaminants

The remainder comprises natural secondary products, which are present in varying amounts depending on the origin and the method of production of the salt, and which are composed mainly of calcium, potassium, magnesium and sodium sulphates, carbonates, bromides, and of calcium, potassium, magnesium chlorides as well. Natural contaminants may also be present in amounts varying with the origin and the method of production of the salt. Copper shall not exceed 2 mg/kg (expressed as Cu).

3.3 Use as a carrier

Food grade salt shall be used when salt is used as a carrier for food additives or nutrients for technological or public health reasons. Examples of such preparations are mixtures of salt with nitrate and/or nitrite (curing salt) and salt mixed with small amounts of fluoride, iodide or iodate, iron, vitamins, etc., and additives used to carry or stabilize such additions.

3.4 Iodisation of food grade salt

In iodine-deficient areas, food grade salt shall be iodised to prevent iodine-deficiency disorders (IDD) for public health reasons.

3.4.1 Iodine compounds

For the fortification of food grade salt with iodine, use can be made of sodium and potassium iodides or iodates.

3.4.2 Maximum and minimum levels

The maximum and minimum levels used for the iodisation of food grade salt are to be calculated as iodine (expressed as mg/kg) and shall be established by the national health authorities in the light of the local iodine deficiency situation.

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[2] The *Codex Standard for Food Grade S*alt was adopted by the Codex Alimentarius Commission at its 16th session in 1985. A revised Standard was adopted by the 22nd session in 1997 and amended by the 23rd session in 1999, the 24th session in 2001 and the 29th session in 2006.

3.4.3 Quality assurance

The production of iodised food grade salt shall only be performed by reliable manufacturers having the knowledge and the equipment requisite for the adequate production of iodised food grade salt, and specifically, for the correct dosage and even intermixing.

4. FOOD ADDITIVES

Food additives listed in Tables 1 and 2 of the Codex *General Standard for Food Additives* (CODEX STAN 192-1995) in Food Category 12.1.1 (Salt) may be used in foods subject to this standard.

5. CONTAMINANTS

The products covered by this Standard shall comply with the Maximum Levels of the Codex *General Standard for Contaminants and Toxins in Food*s (CODEX/STAN 193-1995) established by the CAC.

6. FOOD HYGIENE

It is recommended that the products covered by the provisions of this standard be prepared and handled in accordance with the appropriate sections of the *Recommended International Code of Practice – General Principles of Food Hygiene* (CAC/RCP 1-1969), and other relevant Codex texts such as Codes of Hygienic Practice and Codes of Practice.

7. LABELLING

In addition to the requirements of the Codex *General Standard for the Labelling of Pre-packaged Foods* (CODEX STAN 1-1985) the following specific provisions apply:

7.1 The name of the product

7.1.1 The name of the product, as declared on the label shall be "salt".

7.1.2 The name "salt" shall have in its close proximity a declaration of either "Food Grade" or "Cooking Salt" or "Table Salt".

7.1.3 Only when salt contains one or more ferrocyanide salts, added to the brine during the crystallization step, the term "dendritic" could be included accompanying the name.

7.1.4 Where salt is used as a carrier for one or more nutrients, and sold as such for public health reasons, the name of the product shall be declared properly on the label, for example "salt fluoridated", "salt iodated", "salt iodized", "salt fortified with iron", "salt fortified with vitamins" and so on, as appropriate.

7.15 An indication of either the origin, according to the description on Section 2, or the method of production may be declared on the label, provided such indication does not mislead or deceive the consumer.

7.2 Labelling of non-retail containers

Information for non-retail containers shall either be given on the container or in accompanying documents, except that the name of the product, lot identification and name and address of the manufacturer or packer shall appear on the container. However, lot identification and the name and address of the manufacturer or packer may be replaced by an identification mark, provided that such mark is clearly identifiable with the accompanying documents.

8. PACKAGING, TRANSPORTATION AND STORAGE

In any salt iodisation program, it is important to ensure that salt contains the recommended amount of iodine at the time of consumption. The retention of iodine in salt depends on the iodine compound used, the type of packaging, the exposure of the package to prevailing climatic conditions and the period of time between iodisation and consumption. To ensure that iodized salt ultimately reaches the consumer with the specified level of iodine, the following precautions may be taken into consideration by countries where climatic and storage conditions could result in a large amount of iodine loss:

8.1 If necessary in order to avoid the loss of iodine, iodised salt should be packed in air tight bags of either high density polyethylene (HDPE) or polypropylene (PP) (laminated or non-laminated) or LDPE-lined jute bags (Grade 1803 DW jute bags lined with 150 gauge polyethylene sheet). In many countries, this may

require a major switch from conventional packaging materials made of straw or jute. The cost of adding extra iodine to compensate for its loss from cheaper packaging (i.e., straw or jute) must be weighed against the cost of switching to the above expensive packing material.

8.2 Bulk packing units should not exceed 50 kg (in accordance with International Labour Organization (ILO) Conventions) to avoid the use of hooks for lifting the bags.

8.3 Bags that have already been used for packing other articles such as fertilizers, cement, chemicals, etc. should not be reused for packing iodised salt.

8.4 The distribution network should be streamlined so as to reduce the interval between iodisation and consumption of salt.

8.5 Iodised salt should not be exposed to rain, excessive humidity or direct sunlight at any stage of storage, transportation or sale.

8.6 Bags of iodised salt shall be stored only in covered rooms or "godowns" that have adequate ventilation.

8.7 The consumer should be similarly advised to store iodised salt in such a manner as to protect it from direct exposure to moisture, heat and sunlight.

9. METHODS OF ANALYSIS AND SAMPLING

9.1 Sampling (see Appendix)

9.2 Determination of sodium chloride content

This method allows the calculation of sodium chloride content, as provided for in Section 3.1, on the basis of the results of the determinations of sulphate (Method 9.4), halogens (Method 9.5), calcium and magnesium (Method 9.6), potassium (Method 9.7) and loss on drying (Method 9.8). Convert sulphate to $CaSO_4$ and unused calcium to $CaCl_2$, unless sulphate in sample exceeds the amount necessary to combine with calcium, in which case convert calcium to $CaSO_4$ and unused sulphate first to $MgSO_4$ and any remaining sulphate to Na_2SO_4. Convert unused magnesium to $MgCl_2$. Convert potassium to KCl. Convert unused halogens to NaCl. Report the NaCl content on a dry matter basis, multiplying the percentage NaCl by 100/100-P, where P is the percentage loss on drying.

9.3 Determination of insoluble matter

According to ISO 2479-1972 "Determination of matter insoluble in water or in acid and preparation of principal solutions for other determinations".

9.4 Determination of sulphate content

According to ISO 2480-1972 "Determination of sulphate content - barium sulphate gravimetric method". Alternatively, EuSalt/AS 015-2007 "Determination of Elements Emission Spectrometric Method (ICP-OES)" or EuSalt/ AS 018-2005 "Determination of Anions High Performance Ion Chromatography (HPIC) may be used."

9.5 Determination of halogens

According to ISO 2481-1973 "Determination of halogens, expressed as chlorine - mercurimetric method" (for the recovery of mercury from the laboratory waste, see Annex of ECSS/SC 183-1979). Alternatively, EuSalt/AS 016-2005 "Determination of Chloride Potentiometric method or EuSalt/ AS 018-2005 "Determination of Anions High Performance Ion Chromatography (HPIC)" may be used.

9.6 Determination of calcium and magnesium contents

According to ISO 2482-1973 "Determination of calcium and magnesium contents - EDTA complexometric methods". Alternatively, EuSalt/AS 009-2005 "Determination of Calcium and Magnesium Flame Atomic Absorption Spectrometric Method" or EuSalt/ AS 015-2007 "Determination of Elements Emission Spectrometric Method (ICP-OES) may be used.

9.7 Determination of potassium content

According to EuSalt/AS 007-2005 "Determination of potassium content by sodium tetraphenylborate volumetric method". Alternatively EuSalt/AS 008-2005 " Determination of potassium by flame atomic absorption spectrophotometric method" or EuSalt/ AS 015-2007 "Determination of Elements Emission Spectrometric Method (ICP-OES) may be used.

9.8 Determination of the loss on drying (conventional moisture)

According to ISO 2483-1973 "Determination of the loss of mass at 110 °C".

9.9 Determination of copper content

According to EuSalt/AS 005-2005 "Determination of copper content - zinc dibenzyldithiocarbamate photometric method". Alternatively, EuSalt/ AS 015-2007 "Determination of Elements Emission Spectrometric Method (ICP-OES) may be used.

9.10 Determination of arsenic content

According to method EuSalt/AS 011-2005 "Determination of arsenic content - silver diethyldithiocarbamate photometric method". Alternatively, EuSalt/ AS 015-2007 "Determination of Elements Emission Spectrometric Method (ICP-OES) may be used.

9.11 Determination of mercury content

According to method EuSalt/AS 012-2005 "Determination of total mercury content - cold vapour atomic absorption spectrometric method".

9.12 Determination of lead content

According to method EuSalt/AS 013-2005 "Determination of total lead content - flame atomic absorption spectrometric method". Alternatively, EuSalt/ AS 015-2007 "Determination of Elements Emission Spectrometric Method (ICP-OES) may be used.

9.13 Determination of cadmium content

According to method EuSalt/AS 014-2005 "Determination of total cadmium content - flame atomic absorption spectrometric method". Alternatively, EuSalt/ AS 015-2007 "Determination of Elements Emission Spectrometric Method (ICP-OES) may be used.

9.14 Determination of iodine content

According to method EuSalt/AS 002-2005 "Determination of total iodine content - titrimetric method using sodium thiosulfate". Alternatively the method from WHO/UNICEF/ICCIDD "Assessment of iodine deficiency disorders and monitoring their elimination. A guide for programme managers. Third edition, Annex 1:Titration method for determining salt iodate and salt iodine content. World Health Organization, Geneva, 2007" or EuSalt/AS 019-2009 “Determination of Total Bromine and Iodine Emission Spectrometric Method (ICP-OES)” may be used.

APPENDIX

METHOD FOR THE SAMPLING OF FOOD GRADE SALT FOR THE DETERMINATION OF SODIUM CHLORIDE

1. SCOPE

This method specifies the sampling procedure to be applied when determining the main component in order to assess the food grade quality of sodium chloride (salt) as provided for in the Codex Standard for Food Grade Salt, Section 3: "Essential Composition and Quality Factors".

The criterion to be used for acceptance or rejection of a lot or consignment on the basis of this sample is also provided.

2. FIELD OF APPLICATION

This method is applicable to the sampling of any type of salt intended for use as food, either prepacked or in bulk.

3. PRINCIPLE

This method represents a variables sampling procedure for mean quality: blended bulk sample analysis.

A blended bulk sample is produced in such a way that it is representative of the lot or consignment. It is composed of a proportion of items drawn from the lot or consignment to be analyzed.

Acceptance criterion is on the basis that the mean value obtained from analyses of those blended bulk samples must comply with the provision in the Standard.

4. DEFINITIONS

The terms used in this sampling method refer to those in the *"General Guidelines on Sampling" (CAC/GL 50-2004) unless stated otherwise.*

5. EQUIPMENT

The sampling equipment used should be adapted to the nature of the tests to be carried out (for example: sampling by borer, sampling equipment made of chemically inert material, etc.). The containers used for collecting the samples should be made of a chemically inert material and should be air-tight.

6. PROCEDURE

6.1 Prepacked Salt

Sampling may be carried out by "random sampling" or by "systematic sampling". The choice of the method to be used depends on the nature of the lot (for example: if the packages are marked with successive numbers, systematic sampling may be suitable).

6.1.1 Random sampling

Draw the n items from the lot in such a way that each item in the lot has the same chance of being selected.

6.1.2 Systematic sampling

If the N units in the lot have been classified and can be numbered from 1 to N, the 1-in-k systematic sampling of n items can be obtained as follows:

a) Determine the k value as k = N/n. (If k is not an integer, then round to the nearest integer).

b) From the first k items in the lot take one at random and then take every k^{th} item thereafter.

6.2 Salt in Bulk

Here, the lot is fictitiously divided into items (strata); a lot with a total mass of m kg is considered to be composed of m/100 items. In this case, it is necessary to draw up a "stratified sampling" plan appropriate to the lot dimension. The samples are selected from all the strata in proportion to the stratum sizes.

Note: Stratified sampling of a population which can be divided into different subpopulations (called strata) is carried out in such a way that specified proportions of the sample are drawn from the different strata.

6.3 Constitution of the Sample

6.3.1 The size and the number of the items forming the sample depend on the type of salt and the lot magnitude. The minimum size to be taken into account should be in accordance with one of the following specifications according to the circumstances:

- 250 g of salt in bulk or prepacked in more than 1 kg packages;
- one package for prepacked salt in 500 g or 1 kg packages.

The appropriate number of samples to be drawn from the lot, shall be determined in accordance with "*General Guidelines on Sampling*" (CAC/GL 50-2004).

6.3.2 Combine and mix well the different items drawn from the lot. This blended bulk sample constitutes the laboratory sample. More than one laboratory sample may be composed in such a manner.

7. ACCEPTANCE CRITERION

7.1 Determine the NaCl content (%) of at least two test portions of the laboratory sample.

7.2 Calculate the average of the results obtained for the n test portions of the laboratory sample using:

$$\bar{x} = \frac{\sum x}{n} (n \geq 2)$$

7.3 In accordance with the provision for the relevant NaCl content (%), a lot or a consignment shall be considered acceptable if the following condition is verified:

$\bar{x} \geq$ minimum level specified.

8. SAMPLING REPORT

The sampling report should contain the following information:

a) type and origin of the salt;

b) alterations of state of the salt (e.g. presence of foreign matter);

c) date of sampling;

d) lot or consignment number;

e) method of packing;

f) total mass of lot or consignment

g) number, unit mass of packages and whether the mass is given net or gross;

h) number of items sampled;

i) number, nature and initial position of sampled items;

j) number, composition and mass of the bulk sample(s) and the method used to obtain and conserve it (them);

k) names and signatures of the people who carried out the sampling.