GCC STANDARDIZATION ORGANIZATION (GSO)

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GSO5/ DS / **1021** : 2009

Gluten free foods

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FOREWORD

The Gulf Standardization Organization for GCC (GSO) is a regional organization which consists of the National Standards Bodies of GCC member States. One of GSO main functions is to issue Gulf Standards / Technical regulation through specialized technical committees (TCs).

GSO through the technical program of committee TC NO.5 "Gulf technical committee for standards of food and agriculture products " has updated " Gluten free foods " the draft standard has been prepared by the state of Qatar. The draft standard has been prepared based on relevant ADMO, International and national foreign standards and references.

This standard has been approved as Gulf standard without any technical modifications by GSO Board of Direction in its meeting No…/…. ……held on / / / H, / / G

Gluten free foods

1 Scope :

The standard is concerned with the foods for special dietary uses that have been formulated, processed or prepared to meet the special dietary needs of people intolerant to gluten. Foods for general consumption which by their nature are suitable for use by people with gluten intolerance.

2 Complementary references :

2.1 GSO 9 " Labelling of Prepackaged Foods ".

2.2 GSO 21 " Hygienic Regulations for Food Plants and Their Personnel ".

2.3 GSO 150 " Expiration periods of food products ".

2.4 GSO 382 'Maximum Limits for Pesticide Residues in Agricultural Food Products – Part 1".

2.5 GSO 383 " Maximum Limits for Pesticide Residues in Agricultural Food Products – Part 2 ".

2.6 GSO 654 " General Requirements for Foods for Special Dietary Uses ".

2.7 GSO 841 " Maximum Limits of Mycotoxins permitted in Foods and animal seeds – Aflatoxins ".

Draft GSO Standard to be approved by the organization on:

2.8 " Methods of Determination of Mycotoxins in foods ".

2.9 " Method for Determination of Pesticide Residues in Agricultural Food Products ".

2.10 " Microbiological Criteria for Foodstuffs Part 2 ".

3 Definitions : -

3.1 Gluten

For the purpose of this standard, "gluten" is defined as a protein fraction from wheat, rye, barley, oats or their crossbred varieties and derivatives thereof, to which some persons are intolerant and that is insoluble in water and 0.5M NaCl.

3.2 Prolamins

Prolamins are defined as the fraction from gluten that can be extracted by 40 - 70% of ethanol. The prolamin from wheat is gliadin, from rye is secalin, from barley hordein and from oats avenin. It is however an established custom to speak of gluten sensitivity. The prolamin content of gluten is generally taken as 50%.

3.3 Gluten-free foods

Gluten-free foods are dietary foods :

3.3.1 consisting of or made only from one or more ingredients which do not contain wheat (i.e., all Triticum species, such as durum wheat, spelt, and kamut), rye, barley, oats or their crossbred varieties, and the gluten level does not exceed 20 mg/kg in total, based on the food as sold or distributed to the consumer, and/or

3.3.2 consisting of one or more ingredients from wheat (i.e., all Triticum species, such as durum wheat, spelt, and kamut), rye, barley, oats1 or their crossbred varieties, which have been specially processed to remove gluten, and the gluten level does not exceed 20 mg/kg in total, based on the food as sold or distributed to the consumer.

3.4 Foods specially processed to reduce gluten content to a level above 20 up to 100 mg/kg These foods consist of one or more ingredients from wheat (i.e., all Triticum species, such as durum wheat, spelt, and kamut), rye, barley, oats1 or their crossbred varieties, which have been specially processed to reduce the gluten content to a level above 20 up to 100 mg/kg in total, based on the food as sold or distributed to the consumer. Decisions on the marketing of products described in this section may be determined at the national level.

4 Requirements : -

The following requirements shall be met in gluten - free foods:

4.1 The general requirements mentioned in GSO standard item (2.6) shall be met.

4.2 All ingredients used in the production shall conform to relevant GSO standards.

4.3 The product shall be manufactured and packed according to the hygienic requirements given the GSO standard mentioned in item (2.2).

4.4 The products shall be prepared with special care under Good Manufacturing Practice (GMP) to avoid contamination with gluten.

4.5 Products covered by this standard substituting important basic foods, should supply approximately the same amount of vitamins and minerals as the original foods they replace.

4.6 The gluten content shall not exceed 20 mg/kg in the food as sold or distributed to the consumer as limits given in GSO standard mentioned in item (3.3).

4.7 The gluten content shall not exceed 100 mg/kg in the food as sold or distributed to the consumer as limits given in GSO standard mentioned in item (3.4).

4.8 The mycotoxins limits shall not exceed those limits given in GSO standard mentioned in item (2.7).

4.9 The pesticides residues shall not exceed those limits given in GSO standards mentioned in items (2.4) and (2.5).

4.10 The microbiological limits shall be according to those given in GSO standard mentioned in item (2.10).

5 Samplings : -

Samples shall be drawn in accordance with relevant GSO standard for the product to be tested.

6 Methods of testing and examinations : -

6.1 Method of testing

6.1.1 Determination of mycotoxins shall be carried out according to GSO standard mentioned in item (2.8).

6.1.2 Determination of pesticide residues shall be carried out according to GSO standard mentioned in item (2.9).

6.1.3 Determination of gluten

6.1.3.1 Principle

The determination of gluten is based on an immunology and chemical methods:

6.1.3.2 The extraction of proteins

6.1.3.2.1 Pretreatment of solid foodstuffs and ingredients

6.1.3.2.1.1 Products with a fat-content higher than 10%.: Five grams of the product are homogenized with a blender in 50 ml hexane. The suspensions centrifuged for 30 min at 1500 x g; the supernatant discarded and the extraction step is repeated until the sample is fat-free. The pellet is dried at 60oC, weighed, milled and an aliquot is used for analysis.

6.1.3.2.1.2 In products with a fat-content lower than 10% an extraction is generally not necessary.

Five grams of the product are dried at 60oC milled and an aliquot is used for analysis.

6.1.3.2.2 Extraction

6.1.3.2.2.1 Solid food stuffs and ingredients

An aliquot of the dried sample is homogenized with 60% aqueous ethanol in a volume 10 time its weight; homogenized for 2 minutes and after 15 minutes. Centrifuged for 10 min at 1500 x 9. The supernatant is taken off and stead if necessary at 4oC before determination. When precipitate is formed this is spun down and discarded.

6.1.3.2.2.2 Liquid foodstuffs and ingredients

An aliquot of a liquid product is diluted with ethanol; the added volume of ethanol being calculate to yield 60% ethanol in the resulting mixture. The mixture is homogenized and further treated like solid food extracts.

6.1.3.3 Determination of gliadin

6.1.3.3.1 Plate preparation

Microtiter plates are coated overnight with an antibody against glidain in an appropriate dilution (e.g. 1 in 600) in a sodium carbonate buffer. The plate is washed three items with phosphate-buffered saline with 0.05% Tween (PBS-T) and once more with deionized water containing 0.03% Na-azide. Plates can be stored at 4oC in a sealed plastic bag.

6.1.3.3.2 Standard

It is necessary to use a gliadin standard in order to minimize inter assay variation. Apart from the a ‘golden standard” should be used to make comparison of the results from different laboratories with different ELISA-techniques and with

different antisera possible. The "golden standard" should be prepared by one laboratory under strictly standardized conditions.

6.1.3.3.3 Determination

After appropriate dilution of the extract the samples and the necessary standard dilutions to obtain a standard curve are brought into the wells of the plate. After incubation for 2 hours, the plates are washed three times with cold PBS-T .To the wells the monoclonal or polyclonal antibody against gliadin conjugated with an enzyme is added and after incubation for 2 hours the plates are emptied and washed three times with PBS-T. Then a substrate for the enzyme is added. After an appropriate time the reaction is stopped. The absorptions measured directly in the micrometer plates.

The gliadin concentrations is determined from the standard curve obtained. The result is multiplied by 2 to obtain the gluten content and expressed in ppm of the original product.

6.1.3.4 Remarks

6.1.3.4.1 The method determines the amount of prolamin in a product. It is however important to stress that the total daily intake of prolamin for coeliac patients should not exceed 10 mg per day.

6.1.3.4.2 The method is sensitive for native prolamins. The sensitivity for heated products is depending on the temperature and time of heating lower. It may be reduced to 10% of the original sensitivity. The reduction in sensitivity is related to the amount of w-gliadin in the sample and the sensitivity of the antibody for the different subfractions in the gliadin.

6.1.3.4.3 Depending on the specificity of the antibody, the method determines also the prolamins from rye, barley and oats as gliadin equivalents. The response in the assay however can be different from that for gliadin and must in that case be determined separately with an appropriate standard.

6.1.3.4.4 If the method gives a positive result and there is some doubt about the specificity, a blot after electrophoretic separation of the sample can be performed.

6.1.3.4.5 Products from partial hydrolysis of prolamins can, depending on the degree of hydrolysis, not always been determined by the method described.

6.1.3.4.6 Polyphenols such as those from tea, hops or cocoa decrease the yield of the extraction of prolamins by binding to the latter. Addition of casein as a competing protein as well as urea is necessary in that case.

6.1.3.4.7 The detection limit of the method should be at least 10 ppm in the product on a dry matter basis.

6.2 Tests : -

Exams shall be carried out in the representative samples drawn according to item (5) to determine its compliance with limits of this standard.

7 Packaging , transportation and storage : -

7.1 Packaging : -

The product shall be packed in hygienic clean suitable container so as to avoid any changes in its properties during storage.

7.2 Transportation : -

Transportation shall be carried out in such away so as to protected containers from mechanical damage and contamination.

7.3 Storage : -

The product shall be stored in a well ventilated place away from the source of direct heat, moisture and contamination.

8 Labelling : -

Without prejudice to what is given in GSO standards mentioned in 2.1 and 2.5 the following information shall be declared on the label of the containers:

8.1 The term “gluten - free” shall be given in the immediate proximity of the name of the product.

8.2 The labelling of products described in item (3.4)should be determined at the national level. However these products must not be called gluten-free. The labelling terms for such products should indicate the true nature of the food, and shall be printed in the immediate proximity of the name of the product.

8.3 A food which, by its nature, is suitable for use as part of a gluten-free diet, shall not be designated “special dietary”, “special dietetic” or any other equivalent term. However, such a food may bear a statement on the label that “this food is by its nature gluten-free” provided that it complies with the essential composition provisions for gluten-free as set out in item (4.3) and provided that such a statement does not mislead the consumer. More

detailed rules in order to ensure that the consumer is not misled may be determined at the national level.

Main references

Codex standard

No. 118 - 2008 2008 – 118 •••

Foods for special dietary use

persons intolerant to gluten