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China Announces New Standards on Edible Alcohol

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Report Highlights:

On September 4, 2015, China notified the WTO of the National Food Safety Standard on Edible alcohol, issued by the National Health and Family Planning Commission (NHFPC), as SPS/N/CHN/990. The deadline for submission of final comments to China is November 3, 2015. This standard pertains to aqueous alcohol which uses grains, potatoes, molasses or other edible crops as ingredients, produced through fermentation, distillation and refining, and is used in the food industry. The proposed date of entry is yet to be determined. Comments can be sent to China's SPS Enquiry Point at sps@aqsiq.gov.cn. The following report contains an unofficial translation of this draft measure.

Executive Summary:

On September 4, 2015, China notified the WTO of the National Food Safety Standard on Edible alcohol, issued by the National Health and Family Planning Commission (NHFPC), as SPS/N/CHN/990. The deadline for submission of final comments to China is November 3, 2015. This Standard partially replaces (GB 10343-2008) on Edible Alcohol. This standard pertains to aqueous alcohol which uses grains, potatoes, molasses or other edible crops as ingredients, produced through fermentation, distillation and refining, and is used in the food industry. The proposed date of entry is yet to be determined. Comments can be sent to China's SPS Enquiry Point at sps@aqsiq.gov.cn. The following report contains an unofficial translation of this draft measure. In addition, interested parties are also welcomed to submit comments through the U.S. SPS Enquiry Point below so that comments can be considered as part of the U.S. Government official comment submission to the WTO:

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BEGIN TRANSLATION:

National Standards on Edible Alcohol

Issued by National Health and Family Planning Commission of the People's Republic of China

PREAMBLE

This Standard partially replaces GB 10343-2008 Edible Alcohol. The indicators mentioned in this Standard shall prevail over those in GB 10343-2008 Edible Alcohol.

Compared with GB 10343-2008, this Standard has the following main changes:

- The name has been changed to National Food Safety Standard for Food Edible Alcohol;
- Changed the physical and chemical indicators;
- Changed the contaminant indicator;
- Deleted the testing rules.

Edible Alcohol

1 Scope

This Standard shall apply to edible alcohol.

2 Terms and Definitions

2.1 Edible Alcohol

It refers to aqueous alcohol which uses grains, potatoes, molasses or other edible crops as ingredients, produced through fermentation, distillation and refining, and is used in the food industry.

3 Technical Requirements

3.1 Requirements of Ingredients

The ingredients shall conform to the applicable food standards and regulations.

3.2 Sensory Requirements

Sensory requirements are listed in Table 1 below.

Table 1 Sensory Requirements

Item	Indicator	Testing Method
Appearance	Colorless and transparent	Take appropriate amount of samples placed in a beaker, and observe its color, luster and conditions in natural light. It shall be apparent, and free from any normal sight visible foreign material.
Smell	Have the natural aroma of ethanol, and is free from foreign smell	Use mixing cylinder with stopper to take samples 10mL; add water 15mL, cover the stopper, and blend it well. Pour it into a 50mL small beaker, and smell its smell.
Taste	Pure; slightly sweet; no peculiar smell	Take samples 20mL and pour it to a 50mL measuring flask; add water 30mL, blend it well, and put it into a water bath to get the temperature at 20℃; and then pour it into a 100mL small beaker, and taste it.

3.3 Physical and Chemical Requirements

Physical and chemical requirements are listed in Table 2 below.

Table 2 Physical and Chemical Requirements

Item		Requirement	Testing Method
Alcohol content/(%vol)	≥	95.0	GB XXXX National Food Safety Standard - Measurement of Alcohol Concentration in Liquor
Aldehyde (in acetaldehyde) /(mg/L)	≤	30	Refer to Annex A
Methanol/(mg/L)	≤	150	GB XXXX National Food Safety Standard - Measurement of Methanol in Food
Cyanide [a] (In HCN)/(mg/L)	≤	5	GB XXXX National Food Safety Standard - Measurement of Cyanide in Food
[a] Only apply to the products that use cassava as ingredient.			

4 Contaminant Limit

Amount of contaminant shall conform to the limit listed in Table 3 below.

Table 3 Contaminant Limit

Item	Requirement	Testing Method
Heavy Metal (in Pb)/(mg/kg)	1.0	Refer to Annex B.

5. Others

5.1 Packaging

5.1.1 The packaging materials and containers shall conform to the requirements of food hygiene. Shipping alcohol shall use the dedicated tank, tank lorry and iron drum, and shall not be packed in aluminum drum or galvanized container, or in any container susceptible to static electricity or not easily releasing static electricity (such as plastic bucket). Before packaging, strictly check the containers for safety and hygiene.

5.1.2 After filling the tank, the tank and the tank lorry shall be sealed. Upon receipt, the user shall check whether the lead seal is intact.

5.1.3 The external part of the packaging material shall be clean; the mark shall be clearly visible; and the label shall be firmly attached.

5.2 Transport

5.2.1 The transportation facilities shall be clean and sanitary. The product shall not be mixed with any toxic, hazardous, corrosive or odorous items.

5.2.2 Handle with care. Do not drop, bump and violently shock. Stay away from heat source and fire.

5.2.3. Shall protect against fire, explosion, static electricity and lightning during transportation. Sun exposure is strictly prohibited.

5.3 Storage

5.3.1. The product shall not be mixed with any toxic, hazardous, corrosive or odorous items in storage.

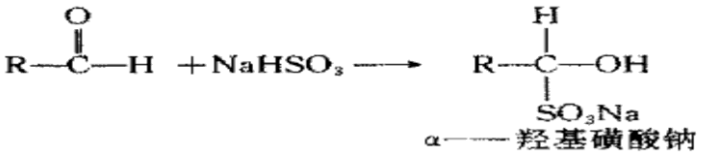
5.3.2. The product shall be stored in a cool, dry and ventilated environment, with facilities protecting against high temperature, fire, static electricity and lightning. The storage area shall have prominent warning signs of “NO FIRE”.

Annex A
Measuring aldehyde in edible alcohol.

A.1 Iodimetry

A.1.1 Principle

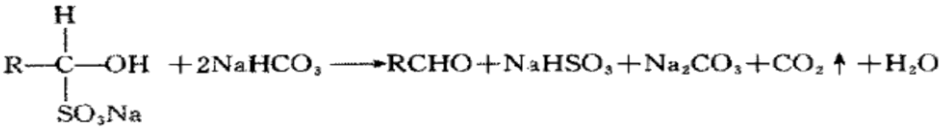
Addition reaction of sodium bisulfite and aldehyde, with the following chemical equation:



Use iodine excess sodium bisulfite, with the following chemical equation:

$$NaHSO_3 + I_2 + H_2O \longrightarrow NaHSO_4 + 2HI$$

Add excessive $NaHCO_3$ to decompose addition compound, and aldehyde will be free again, with the following chemical equation:



Use iodine standard solution to titrate and decompose the released sodium bisulfite.

A.1.2 Reagent and Solution

A.1.2.1 Hydrochloric acid solution [c (HCl) =0.1mol/L]: prepared as per GB/T 601.

A.1.2.2 Sodium bisulphite solution (12g/L).

A.1.2.3 Sodium bicarbonate solution [c (NaHCO3) =1mol/L].

A.1.2.4 Iodine standard solution [c (1/2 I2) =0.1 mol/L]: prepared and calibrate as per GB/T 601.

A.1.2.5 Iodine standard titration solution [c (1/2 I2) =0.01mol/L]: accurately dilute 0.1mol/L iodine standard solution by 10 times. A.1.2.6 Starch indicator solution (10g/L): prepared as per GB/T 603.

A.1.3 Analysis Steps

Draw sample 15.0mL into 250mL iodine flask, and add 15mL water, 15mL sodium bisulphite solution (A.1.2.2) and 7mL hydrochloric acid solution (A.1.2.1). Shake it, and place it at a dark place for 1 hour. Take it out and use 50mL water to rinse the bottle stopper. Use iodine standard solution (A.1.2.4) to titrate it, and when it is close to the end point, add 0.5mL starch indicator solution. Use iodine standard titration solution (A.1.2.5) to titrate it when it appears light bluish purple (do not count). Add 20mL sodium bicarbonate solution (A.1.2.3), slightly open the stopper, and shake it for 0.5 minute (till it becomes colorless). Use standard iodine standard solution (A.1.2.5) and continue to titrate it till it becomes bluish purple. Conduct a blank test at the same time.

A.1.4 Calculation. Calculate the aldehyde content in the sample according to equation (3)

Where:

$$X = \frac{(V_1 - V_2) \times c \times 0.022}{15} \times 10^6 \quad \text{.....} \quad (1)$$

X: aldehyde content in the sample (in acetaldehyde), at the unit of mg/L;

V_1: Volume of iodine standard titration solution consumed in the sample, at the unit of mL;

V_2: Volume of iodine standard titration solution consumed in the blank test, at the unit of mL;

c: Concentration of iodine standard titration solution, at the unit of mol/L;

0.022: weight of acetaldehyde expressed in gram equivalent to 1.00mL iodine standard solution [c(1/2I2)=1.000mol/L). The result is rounded up to integer.

A.1.5 Precision.

Under the same conditions, if the aldehyde content is more than 5mg/L, the difference between two independent measurements shall not exceed the average by more than 5%; if the aldehyde content is less than or equal to 5mg/L, the difference shall not exceed the average by more than 13%.

A.2 Calorimetry

A.2.1 Principle

Aldehyde and sulfurous acid-fuchsine will have addition reaction. The sulfurous acid will be lost after molecular rearrangement, and it forms a purplish red substance with the Quinone structure.

The color depth is proportional to the aldehyde content.

A.2.2 Reagent and Solution

A.2.2.1 Sodium bisulfite solution: get 53.0g sodium bisulfite (NaHSO3), and dissolve it in 100mL water.

A.2.2.2 Sulfuric acid: density 1.84g/mL.

A.2.2.3 Color agent alkaline fuchsine - sulfurous acid: get 0.075g alkaline fuchsine and dissolve it in a few amount of water at 80℃. Cool it down, and dilute it with water to about 75mL. Move it to a 1L brown narrow-mouthed bottle, add 50mL newly prepared sodium bisulphite solution (A.2.2.1), add 500mL water and 7.5mL sulfuric acid (A.2.2.2), shake it well and then place it for 10 ~ 12 hours. After the color of solution is faded and has a strong smell of sulfur dioxide, place it in the refrigerator to store.

A.2.2.4 Aldehyde standard solution (1g/L): accurately get 0.1386g acetaldehyde ammonia (counted by acetaldehyde: acetaldehyde ammonia =1:1.386). Rapidly dissolve it in base ethanol at 10℃ (aldehyde-free ethanol), and fix the volume to 100mL. Move it into a brown reagent bottle, and store in the refrigerator.

A.2.2.5 Aldehyde standard solution: draw 0.30 mL, 0.50 mL, 0.80 mL, 1.00 mL, 1.50 mL, 2.00 mL, 2.50mL and 3.00mL standard acetaldehyde solution respectively, and put into a 100mL volumetric flask respectively with some base ethanol (aldehyde-free ethanol). Dilute the solution to the scale with the base ethanol. The aldehyde content is 3mg/L, 5mg/L, 8mg/L, 10mg/L, 15mg/L, 20mg/L, 25mg/L and 30mg/L respectively.

A.2.3 Analysis Steps

Draw 2.00mL aldehyde standard solution with the similar content as that of the sample and also draw 2.00mL sample to the maximum limit, and put into a 25mL color comparison tube respectively, and add 5mL water and 2.00mL color agent (A.2.2.3) respectively. Cover them with the stopper and shake them well, and keep them for 20 minutes (if the room temperature is lower than 20℃, must put them into the water bath at 20℃ to develop the color), and then take them out to compare the color. Use a 2cm colorimetric utensil, and set zero with water at wavelength 555nm to determine the absorbency.

A.2.4 Calculation

Calculate the aldehyde content in the sample according to equation (4)

$$X = \frac{A_x}{A} \times c \quad \text{.....} \quad (2)$$

Where:

X: aldehyde content in the sample (in acetaldehyde), at the unit of mg/L;

A_x: absorbency of the sample;

A: absorbency of the aldehyde standard solution;

c: aldehyde content in the standard solution, at the unit of mg/L.

The result is rounded up to integer.

A.2.5 Precision.

Under the same conditions, if the aldehyde content is more than 5mg/L, the difference between two independent measurements shall not exceed the average by more than 5%; if the aldehyde content is less than or equal to 5 mg/L, the difference shall not exceed the average by more than 10%.

Annex B

Measuring heavy metal in edible alcohol

B.1 Principle

Under the weak acid (pH=3~4) Conditions, heavy metal ions (take the lead as an example) act with hydrogen sulfide and generate dark brown sulfide. When content becomes very little, it shows a stable suspension. Its chemical equation is listed as follow:

$$Pb2{+}{+}H2S = PbS{+}2H{+}$$

Then, compare it with the serials of lead standard solutions treated with the same method, and measure the maximum limit.

B.2 Reagent and Solution

B.2.1 Acetate buffer solution (pH = 3.5): get 25.0g ammonium acetate and dissolve it in 25mL water, add 45mL 6mol/L hydrochloric acid, and use diluted hydrochloric acid or diluted ammonia solution (6mol/L or 1mol/L) adjust the pH value to 3.5 with a pH meter. Then, use water to dilute the solution to 100mL.

B.2.2 Phenolphthalein indicator solution (10g/L): prepared as per GB/T 603.

B.2.3 Saturated hydrogen sulfide solution: blow hydrogen sulfide gas into the water without carbon dioxide till it is saturated (this solution should be prepared immediately before use).

B.2.4 Lead standard solutions (1g/L): get 0.1598g high-purity lead nitrate and dissolve it in 10mL 1% nitric acid solution, and quantitatively move it into a 100mL volumetric flask, and dilute it to the scale with water.

B.2.5 Lead standard solution (10 μg/mL): take 1g/L lead standard solution; before the solution is to be used, dilute it 100 times accurately with water.

B.3 Instrument

Colorimetric tube: 50mL.

The glass apparatus in use shall be soaked in 10% nitric acid for more than 24 hours, and then rinsed with tap water repeatedly, and finally rinsed with water till it is clean.

B.4 Analysis Steps

B.4.1 Tube A: draw 2.50mL lead standard solution into a 50mL colorimetric tube, add 25.00mL water and add 1 drop of phenolphthalein indicator solution, adjust the pH value to neutral (when phenolphthalein red is just faded) with diluted hydrochloric acid or diluted ammonia, add 5mL acetate buffer solution (0), mix well and set it aside.

B.4.2 Tube B: directly take 25mL sample with a 50mL colorimetric tube, add 2.5mL water and add 1 drop of phenolphthalein indicator solution, adjust the pH value to neutral (when phenolphthalein red is just faded) with diluted hydrochloric acid or diluted ammonia, add 5mL acetate buffer solution (0), mix well and set it aside.

B.4.3 Tube C: directly take 25.0mL sample (same as Tube B) with a 50mL colorimetric tube, add 2.50mL lead standard solution (equal to Tube A) and mix it well; add 1 drop of phenolphthalein indicator solution, adjust the pH value to neutral (when phenolphthalein red is just faded) with diluted hydrochloric acid or diluted ammonia, add 5mL acetate buffer solution (0), mix well and set it aside.

B.4.4 Add 10mL freshly prepared saturated hydrogen sulfide solution (0) into each tube mentioned above, mix them well and place them in a dark place for 5 minutes. Take them out, and compare the color under a white background. Color of Tube B shall not be deeper than that of Tube A; color of Tube C shall be same as or deeper than that of Tube A.