



**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB 1886.89-2015

**National Food Safety Standard -- Food Additives -- Licorice
antioxidants**

食品安全国家标准 食品添加剂 甘草抗氧化物

(English Translation)

Issued on: September 22, 2015

Implemented on: March 22, 2016

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

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1 Scope

This standard applies to liquorice (*Radix Glycyrrhizae*) root extract thus obtained was purified by physical methods of food additives with an organic solvent Licorice antioxidants.

2.1 Sensory requirements

Sensory requirements shall comply with the requirements of Table 1.

Table 1 Sensory requirements

Project requires test methods Brown or tan color State powder Licorice smell slightly special smell Take the right amount of sample is placed in a clean, dry white porcelain dish, under natural light Observe the color and status, olfactory and taste it

2.2 Physical indicators

Physical and chemical indicators should be consistent with the provisions of Table 2.

Table 2. Physical and chemical indicators

Item Index Test Method Licorice antioxidant content, w /% ≥ 63.0 Appendix A A.3 Total flavonoids, w /% ≥ 27.0 Appendix A A.4 Melting range/ $^{\circ}\text{C}$ $70 \sim 90$ GB/T 617 Loss on drying, w /% ≤ 5.0 A.5 in Appendix A Arsenic (As)/(mg/kg) ≤ 3.0 GB 5009.76 Heavy metals (Pb)/(mg/kg) ≤ 10.0 GB 5009.74 AOM value (amount of 0.02%)/h ≥ 18.0 A.6 in Appendix A Appendix A Testing method A.1 General Provisions this standard reagents and water in the absence of other specified requirements, refer to the three water analytical reagent and GB/T 6682 regulations.

Standard solutions used in the tests, the determination of impurities standard solution, preparations and products, did not indicate when the other requirements according to GB/T 601, GB/T 602, GB/T 603 provisions of preparation. Solution was used in the tests did not indicate what is formulated with solvent, it refers to an aqueous solution.

A.2 Identification Test A.2.1 Reagents and materials A.2.1.1 ethanol.

A.2.1.2 dichloromethane.

A.2.1.3 ferric chloride in ethanol solution. 10g/L.

A.2.1.4 diazotizing agent.

A solution. 0.5g of p-nitroaniline was dissolved in 5mL of concentrated hydrochloric acid, diluted with water to 50mL.

Solution B. 5g of sodium nitrite dissolved in 50mL water.

Diazotizing agent in clinical use should, take the same amount of A, B two liquid mixture in an ice-water bath for use.

A.2.1.5 sodium carbonate test solution. take sodium bicarbonate 3g, dissolved in 100mL of water.

A.2.2 Identification method A.2.2.1 sample taken 0.5g, dissolved in 100mL of ethanol.

Take the test solution 1mL, plus 1% ferric chloride solution drops 2 to 3 drops, green, blue or purple should produce precipitation. Take the test solution 2mL ~ 3mL, Add equal amount of sodium carbonate solution, boiling water bath 8min, after cooling add a new configuration of diazotization reagent drop 1 to 3 drops, should be significantly muddy crimson.

A.2.2.2 sample taken 1g, each with 20mL dichloromethane was refluxed for 10min, filtered, the volatile dichloromethane concentrate with 50% ethanol 20mL dissolve filtration, the filtrate was collected, to learn the filtrate 1mL in a test tube, a solution of ferric chloride test solution 1 to 2 drops drops, solution should be significantly brown.

A.3 Determination of the antioxidant content of licorice A.3.1 Method summary Licorice antioxidants in antioxidant ingredients easily extracted dichloromethane, after reflux extraction, weighing measurement.

A.3.2 Analysis step

Weigh finely licorice antioxidants sample 1g (accurate to 0.0001g), into a 50mL round bottom flask, each additional dichloromethane 20mL, reflux 15min, extract at 30 °C ~ 35 °C conditions, constant weight filter into a beaker, a total reflux for 5 times, and then with methylene Dioxane 30mL washing the filter paper several times with the washing liquid incorporated into a beaker, evaporated on a water bath, 105 °C drying to constant weight, and weighed.

A.3.3 Calculation Results Licorice antioxidant content mass fraction w_1 , according to equation (A.1) Calculated.

$m \times 100\%$

Where.

After m_1 --- purified licorice anti-quality oxide units of grams (g);

M --- the quality of the sample, in grams (g).

The results parallel arithmetic mean of the measurement results shall prevail. Twice under the same condition of independent determination results obtained absolute difference Value of not more than 0.1% of the arithmetic mean.

A.4 Determination of total flavonoids A.4.1 Method summary Flavonoids molecular structure having C3, can generate colored envelope with aluminum and other metal reagents C5-hydroxyl group or phthaloyl hydroxy Compound, at a wavelength of maximum absorbance at 510nm.

A.4.2 Reagents and materials A.4.2.1 rutin standard.

A.4.2.2 ethanol. 30%.

A.4.2.3 ethanol. 60%.

A.4.2.4 aluminum nitrate. 10%.

A.4.2.5 Sodium hydroxide. 1mol/L.

A.4.2.6 nitrite. 5%.

A.4.3 Analysis step

Preparation of standard solution. Weigh rutin standard 20mg (accurate to 0.1mg), 60% ethanol was dissolved in 100mL flask, and Dilute to the mark. Take this sample solution 20mL in 50mL volumetric flask, add 60% ethanol solution 5mL, diluted with water to the mark, that was standard Solution (1mL standard solution containing about 0.08mg rutin standard).

Preparation of sample solution. Weigh a sample of approximately 20mg (accurate to 0.1mg), 60% ethanol and dissolved in hot 25mL 50mL volumetric flask, Cooled, diluted with distilled water to the mark, that was a sample solution.

They were collected from each of the two liquid 5mL in 10mL volumetric flask, add 5% sodium nitrite solution 0.3mL, shake and let stand 6min, plus 10% aluminum nitrate solution, 0.3mL, shake and let stand 6min, added 1mol/L sodium hydroxide solution 4mL, shake, constant volume with 30% ethanol, Standing 15min, with a 1cm cuvette, at a wavelength of 510nm absorbance was measured at.

A.4.4 Calculation Results Total flavonoid mass fraction w_2 , according to equation (A.2) Calculation $w_2 = 0.04 \times A_1 A_2 m_2 \times K \times 100\%$ (A.2) where.

0.04 --- standards in flavonoid content, in milligrams per milliliter (mg/mL);

A_1 --- absorbance of the sample;

Absorbance A_2 --- standard products;

M_2 --- the quality of the sample, in milligrams (mg);

--- The K sample dilution.

The results parallel arithmetic mean of the measurement results shall prevail. Twice under the same condition of independent determination results obtained absolute difference Value is not more than 0.2% of the arithmetic mean.

A.5 Determination of loss on drying A.5.1 Analysis step Accurately weighed sample 2g (accurate to 0.0002g), placed in an oven, bake at $110\text{ }^{\circ}\text{C} \pm 1\text{ }^{\circ}\text{C}$ to constant weight.

A.5.2 Calculation Results Loss on drying mass fraction w_3 , according to equation (A.3) Calculated.

$m_3 - m_4$

100% (A.3)

Where.

Quality m_3 --- dried before weighing bottle and the sample, in grams (g);

Quality, drying unit after m_4 --- weighing bottle and sample in grams (g);

m_5 --- sample mass, in grams (g).

The results parallel arithmetic mean of the measurement results shall prevail. Twice under the same condition of independent determination results obtained absolute difference Value of not more than 0.1% of the arithmetic mean.

A.6 AOM value (addition amount of 0.02%) is measured A.6.1 Method summary AOM value is under the strict control of the test conditions, the inflatable oil sample to make peroxide value of 100 (equivalent in mg iodine/kg Time when oil sample count) required, as oil sample block index is automatically oxidation.

A.6.2 Instruments and Equipment AOM value of the tester.

A.6.3 Analysis step

The home has a 20mL refined lard (lard antioxidant was added 0.02%) of the tube along the circumference of the circular bath lined up, start stirring Mix and electric thermostats, in order to maintain a constant temperature, oil samples taken at regular intervals, measured peroxide value, peroxide value was measured up 100mgI₂/kg Time needed to (h), is the block index purified lard autooxidation.