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

GB/T 17527-2009

Replacing GB/T 17527-1998

Determination of pepper essential oils content

胡椒精油含量的测定

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Foreword

This standard replaces GB/T 17527-1998 Method for determination of pepper essential oils content.

The main differences with respect to GB/T 17527-1998 are as follows: the title of the standard has been changed to Determination of pepper essential oils content; the distillation rate has been changed from the former 2 drops per second to 5 drops per minute (7.3 of the 1998 edition, 6.2 of this edition); the structure of the standard has been revised (Clause 6 of the 1998 edition, Clause 5 of this edition); some of the worked examples in the calculation of the results have been deleted or modified (Clause 8 of the 1998 edition, Clause 7 of this edition).

This standard was proposed by the Ministry of Agriculture of the People's Republic of China.

This standard is under the jurisdiction of the National Technical Committee on Spices and Condiments Standardization.

Drafting organization of this standard: Food Quality Supervision, Inspection and Testing Centre (Zhanjiang), Ministry of Agriculture.

Main drafters of this standard: Yang Chunliang, Zhou Huiling, Li Zhenlian, Zha Yubing, Lin Ling and Cheng Shenghua.

This standard was first issued in October 1998.

1 Scope

The Chinese national method for measuring how much essential oil a batch of pepper contains. Essential oil is what carries the aroma of pepper, as distinct from the piperine that carries its pungency, and it is the number on which lots of black and white pepper are graded and priced. It is measured by steam distillation: the ground pepper is boiled with water, the oil is carried over with the steam, condensed, collected in a graduated tube where it separates from the water, and read off as a volume per hundred grams of sample. The catch is that the oil is volatile and the reading is easily lost - distil too fast and the vapour is not properly condensed, distil too slowly and the yield falls short within the prescribed time - so the method spends most of its length pinning down the apparatus, the fineness of grinding, the distillation rate and the duration. This standard sets out that apparatus and procedure, the preparation of whole pepper and of pepper powder, the calculation of the result and the repeatability that two determinations must show. It applies to black and white pepper and to their ground forms, and it is used by spice processors, traders and inspection laboratories. The 2009 edition changed the distillation rate from the previous two drops per second to five drops per minute and restructured the standard.

This standard specifies the method for the determination of the content of pepper essential oils.

This standard is applicable to the determination of the essential oil content of black pepper and white pepper and of black and white pepper powder.

2 Terms and definitions

The following terms and definitions apply to this standard.

2.1 Pepper essential oil content

The content of all the substances carried over by steam under the conditions specified in this standard, expressed in mL per 100 g.

3 Principle

An aqueous suspension of the test sample is distilled and the distillate is collected in a graduated receiving tube; in the graduated tube the pepper essential oil and the water separate from each other, the volume of the essential oil is read off and the content of pepper essential oil is calculated.

4 Apparatus

4.1 Volatile oil determination apparatus (see Figure 1), made up of 4.1.1 a round-bottom flask, 4.1.2 a graduated distillation receiving tube and 4.1.3 a bulb condenser, of the capacities and graduation given in the figure.

4.2 Adjustable heating device.

4.3 Measuring cylinder.

4.4 Anti-bumping granules or glass beads.

4.5 Tissue grinder.

4.6 Test sieve, of the specified aperture.

4.7 Balance, of the specified sensitivity.

5 Preparation of the test sample

5.1 Whole pepper. The sample is ground with the grinder (4.5) until all of it passes the test sieve (4.6), and is stored in a brown bottle ready for use.

5.2 Pepper powder. The whole sample is checked through the test sieve (4.6); what does not pass through the sieve mesh is ground with the grinder (4.5) until the particle size meets the requirement, and is stored in a brown bottle ready for use.

6 Analytical procedure

NOTE: pepper essential oil is very volatile on heating; the distillation rate shall be strictly controlled and adequate cooling ensured, otherwise, within the prescribed distillation time, a rate that is too fast or too slow will make the result low or seriously low.

6.1 Preparation of the volatile oil apparatus. Before use, the volatile oil determination apparatus shall be thoroughly washed with potassium dichromate-sulfuric acid cleaning solution to remove any oily soiling.

6.2 Determination. The clause sets out the weighing of the prepared sample into the flask, the addition of distilled water and of anti-bumping granules or glass beads, the connection of the volatile oil apparatus with its receiving tube filled beforehand with distilled water, the gentle distillation at the controlled rate and for the prescribed time, and the reading of the volume of pepper essential oil after the heat source has been switched off and the apparatus has cooled to room temperature.

7 Calculation of the results

The content of pepper essential oil in the test sample, expressed in mL per 100 g, is calculated by Formula (1) from the volume of essential oil measured in the receiving tube, in mL, and the mass of the test sample, in g. The calculated result is kept to three significant figures.

8 Precision

The clause fixes the maximum absolute difference allowed between two independent test results obtained under repeatability conditions, expressed as a proportion of their arithmetic mean, and the proportion of cases in which that difference may be exceeded.

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