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

GB/T 18654.8-2026

Replacing GB/T 18654.8-2008

**Inspection of germplasm for fishes - Part 8: Determination of
oxygen consumption rate and critical asphyxiation point**

鱼类种质检验 第8部分：耗氧率与临界窒息点的测定

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Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part

1. Structure and Drafting Rules of Standardization Documents". Drafting. This document is Part 8 of GB/T 18654 "Fish Germplasm Inspection". GB/T 18654 "Fish Germplasm Inspection" has been published as follows: part.

1. Inspection Rules;
2. Sampling Methods;
3. Characteristic Determination;
4. Measurement of Age and Growth;
5. Dietary Analysis;
6. Determination of reproductive performance;
7. Ecological Characteristics Analysis;
8. Determination of Oxygen Consumption Rate and Critical Asphyxia Point;
9. Meat Percentage Determination;
10. Determination of muscle nutrient composition;

12.Karyotype Analysis;

13.Isozyme Electrophoresis Analysis;

1 Scope

GB/T 18654.8-2026 is the Chinese national standard covering how much oxygen a fish uses and the concentration below which it dies - the two numbers that set the stocking density of a pond and the aeration a farm has to run through a summer night. It replaces GB/T 18654.8-2008 and has been in force since 1 September 2026, one of the parts of the GB/T 18654 fish germplasm inspection series revised together. It was issued on 27 February 2026 and has been in force since 1 September 2026, replacing GB/T 18654.8-2008. The document is under the responsibility of the Ministry of Agriculture and Rural Affairs. This page is published from the official record of the 2026 edition; the clause text of a standard this recent is not yet in circulation, and the figures, limits and tables it contains are those of the document itself, delivered in full with the English translation.

This document describes the experimental conditions, reagents or materials, instruments and equipment, samples, experimental procedures, and methods for determining the oxygen consumption rate and critical asphyxiation point of fish. Experimental data processing methods. This document applies to the determination of oxygen consumption rate and critical asphyxiation point in fish.

4 Test conditions

4.1 The test should be conducted indoors in a quiet environment, away from direct sunlight.

4.2 The test water should be filtered and aerated, and the dissolved oxygen content should not be less than 7 mg/L.

4.3 During the experiment, the air temperature, water temperature, pH value, flow rate and salinity remained stable.

5.Reagents or materials Comply with the provisions of GB/T 7489 and HJ506.

6 Instruments and Equipment

6.1 Test apparatus for fish oxygen consumption rate and critical asphyxiation point The device should ideally consist of a water storage tank, a breathing chamber, water pipes and valves, and a dissolved oxygen meter, as shown in Figure

1.It is not limited to commercially available instruments. The breathing chamber shown in the diagram is a tank-type breathing chamber; a racetrack-type breathing chamber or other similar devices may also be used. The breathing chamber should preferably be transparent and airtight. A sealed cylindrical acrylic container (with a lid at one end, rubber sealing rings around the edges, and bolts to secure it tightly). The breathing chamber typically has a

capacity of... The capacity ranges from 20L to 200L. The volume of the breathing chamber is selected based on the size of the sample fish. The mass ratio of sample fish to water is approximately 1:20. Dissolved oxygen... The measuring instrument should meet the requirements of HJ506.

6.2 Electrochemical Probe It meets the requirements of HJ506.

7 Samples

7.1 Sampling shall be carried out in accordance with the method of GB/T 18654.2.

7.2 The sample fish were of basically the same size and in good health. Each experimental group contained no fewer than 10 sample fish.

8 Test Procedure

8.1 Determination of Dissolved Oxygen Perform according to the methods of GB/T 7489 or HJ506.

8.2.1 Iodometric determination

8.2.1.1 The sample fish were first temporarily held in an aquarium with oxygenated, circulating water until they reached a stable fasting state. The water quality in the temporary holding aquarium was similar to that of the test fish. The verification conditions are consistent.

8.2.1.2 The breathing chamber should be clean, and the test apparatus should be sealed. Close the drain valve, open the water inlet valve to allow water to enter, and wait until the water level in the breathing chamber reaches the top. At this time, close the inlet valve, place the sample fish into the breathing chamber, cover and seal it, then open the inlet and outlet valves to slowly introduce water and expel the air from the breathing chamber. Adjust the inlet and outlet valves to control the flow rate. The flow rate should be adjusted to allow the sample fish in the breathing chamber to move normally.

8.2.1.3 The sample fish were allowed to acclimatize in the breathing chamber for 1-2 hours. Timing began once the fish were in a calm, natural state. Timing was recorded every 1 or 2 hours. Measure the outflow rate, and simultaneously take three 250mL samples each of the inlet and outlet water, and immediately determine the dissolved oxygen content according to the method specified in GB/T 7489. For oxygen, the error between three measurements should be less than

0.1 mg/L; the average result should be taken. Measurements should be taken continuously for 24 hours, and records should be kept. Oxygen Consumption Rate Measurement Record See Appendix A for the table.

8.2.1.4 The same test should be performed three times, and the average value of the

results should be taken.

8.2.2 Electrochemical probe method for determination

8.2.2.1 The sample fish were temporarily kept and deprived of food according to the method in 8.2.1.1.

8.2.2.2 The operation of the breathing room shall be performed in accordance with the method in 8.2.1.2.

8.2.2.3 The sample fish were allowed to acclimatize in the breathing chamber for 1 to 2 hours. Once the sample fish were swimming naturally and the dissolved oxygen meter reading was stable, the timing was started. The outflow rate was measured every 1 or 2 hours, and the dissolved oxygen in the reservoir and breathing chamber was measured according to the method specified in HJ506. Three measurements were performed separately. The error between three measurements should be less than

0.1 mg/L, and the average result should be taken. Measurements should be taken continuously for 24 hours, and records should be kept. Oxygen consumption rate measurement record. See Appendix A for the table.

8.2.2.4 The same test should be performed three times, and the average value of the results should be taken.

8.3.1 Iodometric determination

8.3.1.1 The sample fish were temporarily kept and deprived of food according to the method in 8.2.1.1.

8.3.1.2 Using the measuring device shown in Figure 1, follow the procedure in 8.2.1.2. When the sample fish is in a natural swimming state, close all valves.

8.3.1.3 Observe the activity of the sample fish in the breathing chamber. When 50% of the sample fish lose balance, become comatose, or lose the ability to swim, and dissolved oxygen levels drop, the activity will decrease. When the concentration fluctuation is small, open the inlet and outlet valves, take three water samples from the breathing chamber, and immediately determine the dissolved oxygen levels in the water according to the method specified in GB/T 7489. For oxygen desorption capacity, the error of three measurements should not exceed

0.1 mg/L, and the average value of the results should be taken.

8.3.1.4 The same test should be performed three times, and the average value of the results should be taken.

8.3.2 Electrochemical probe method for determination