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NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB/T 10649-2025

Replacing GB/T 10649-2008

Determination of mixing homogeneity for trace mineral premix

微量元素预混合饲料混合均匀度的测定

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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 supersedes GB/T 10649-2008 "Determination of Mixing Uniformity of Trace Element Premixed Feeds" and is consistent with GB/T 10649-2008. In comparison, aside from structural adjustments and editorial changes, the main technical changes are as follows:

a) The "Scope of Application" has been changed (see Chapter 1, Chapter 1 of the.2008 edition);

b) The "sampling" parameter has been changed (see 4.4.1, Chapter 6 of the.2008 edition);

c) The test procedure for the colorimetric method has been modified (see 4.5, Chapter 8 of the.2008 edition);

d) Added "Atomic Absorption Spectroscopy" (see Chapter 5). Please note that some content in this document may involve patents. The issuing organization of this document assumes no responsibility for identifying patents. This document was proposed and is under the jurisdiction of the National Technical Committee on Standardization of Feed Industry (SAC/TC76). This document was drafted by: Changsha Xingjia Biotechnology Co., Ltd., Chia Tai Premixed Feed (Tianjin) Co., Ltd., and Xinjia Biotechnology (Changsha). Limited Liability Company. The main drafters of this document are. Huang Yiqiang, Ma Qihua, Hong

Shuangsheng, Zhou Changhong, Ruan Jing, Jiang Zhongxiu, Xia Zanqin, Zhou Guilin, Sun Yi, and Zhong Fang. He Changhui and Li Yong. The release history of this document and the document it replaces is as follows:

---First published in 1989 as GB/T 10649-1989; first revised in.2008;

---This is the second revision. Determination of the mixing uniformity of trace element premixed feed

1 Scope

GB/T 10649-2025 is the Chinese national standard on determination of mixing homogeneity for trace mineral premix, in the field of agriculture. The /T suffix marks it as a recommended standard: it is not compulsory by itself, but it becomes binding as soon as a contract, a tender or a customer specification calls it up - which in practice is how most foreign buyers meet it. It was issued on 29 August 2025 by the State Administration for Market Regulation; Standardization Administration of China, and has been in force since 1 March 2026. Classification: ICS 65.120, CCS B46. This page is published from the official record of the standard held by the Chinese standards administration: the identification, the dates, the classification and the issuing body are taken from there. The clause text, the tables and the numeric limits are in the document itself, which is delivered complete in English translation.

This document describes the colorimetric and atomic absorption spectrometry methods for determining the mixing uniformity of trace element premixed feed. This document applies to the determination of the mixing uniformity of micronutrient premixed feeds. The colorimetric method is applicable to micronutrient premixes with added iron. Determination of the mixing uniformity of feed; atomic absorption spectrometry is suitable for determining the mixing uniformity of premixed feeds containing trace elements such as copper. Measurement.

2 Normative references

The contents of the following documents, through normative references within the text, constitute essential provisions of this document. Dated citations are not included. For references to documents, only the version corresponding to that date applies to this document; for undated references, the latest version (including all amendments) applies. This document.

GB/T 6682 Specifications and test methods for water used in analytical laboratories

GB/T 13885 Determination of the content of calcium, copper, iron, magnesium, manganese, potassium, sodium and zinc in feed by atomic absorption spectrometry

GB/T 20195 Preparation of animal feed samples

3 Terms and Definitions

This document does not contain any terms or definitions that need to be defined.

4 Colorimetric method

4.1 Principle After the sample is dissolved in acid, ferric ions are reduced to ferrous ions with hydroxylamine hydrochloride, and then reacted with the colorimetric reagent o-phenanthroline to produce orange. The red complex was analyzed by colorimetric determination of the absorbance of iron. The product was evaluated using the coefficient of variation of absorbance per unit mass of the same batch of samples. Mixing uniformity.

4.2 Reagents or Materials Unless otherwise specified, use only analytical grade reagents.

4.2.1 Water. GB/T 6682, Grade III.

4.2.2 Hydrochloric acid.

4.2.3 Hydroxylamine hydrochloride solution (100 g/L). Weigh 10 g of hydroxylamine hydrochloride, dissolve it in water, dilute to 100 mL, shake well, and transfer to a brown bottle. Store at 2°C~8°C.

4.2.4 Acetate buffer solution. Weigh

8.3 g of anhydrous sodium acetate, dissolve it in water, add 12 mL of glacial acetic acid, and dilute with water to the specified concentration. 100mL, shake well.

4.2.5 O-Phenanthroline solution (1 g/L). Weigh

0.1 g of o-Phenanthroline and dissolve it in 80 mL of water at 80 °C. After cooling, dilute to 100 mL and shake. Mix well, transfer to a brown bottle, and store at 2°C~8°C.

4.3 Instruments and Equipment

4.3.1 Analytical balance. accuracy 0.0001g.

4.3.2 Spectrophotometer. with 1cm cuvette.

4.4.1 Sampling

4.4.1.1 The samples required for this method shall be collected and prepared separately.

4.4.1.2 Sampling at the production site. Sampling is usually done at the packaging area. A specific production batch is selected as the test batch. Production is then carried out based on this batch. The time interval for each sampling is calculated according to equal time intervals. After the equipment is running stably, 10 samples are randomly selected manually or mechanically. Each sample should weigh between 50g and 100g. No stirring or mixing

should occur during sampling.

Note. If the mixing performance of the mixer is to be measured, a sample should be taken at the discharge port of the mixer.

4.4.1.3 Product Sampling After Packaging. Select a specific packaging batch as the test batch. Based on the total number of packaging bags in that batch, randomly select... Ten samples were drawn from ten packaging bags, each weighing between 50g and 100g. During sampling, each sample was drawn from a single point, and should not be... There was no stirring or mixing.

4.4.2 Sample Preparation Implement in accordance with the provisions of GB/T 20195.

4.5 Test Procedure Accurately weigh 1g to 10g of the sample (accurate to 0.0001g) into a 250mL beaker, moisten with a small amount of water, and slowly add 20mL of salt. Add acid (4.2.2), shake well, add 50 mL of water, stir well, transfer to a 250 mL volumetric flask, dilute to volume with water, shake well, and filter. Based on the sample... The iron content was further diluted to achieve an iron concentration of 15 μg/mL in the sample solution. 2 mL of the solution was accurately transferred to a 25 mL volumetric flask. Add 1 mL of hydroxylamine hydrochloride solution (4.2.3), mix thoroughly, and after 5 min, add 5 mL of acetate buffer solution (4.2.4), shake well, and then add... Add 5 mL of o-phenanthroline solution (4.2.5), dilute with water to 25 mL, mix thoroughly, let stand for 30 min, and use a reagent blank as a reference to analyze the sample using spectrophotometry. The absorbance of the test solution was measured at a wavelength of 510 nm using a photometer. This procedure was then followed to measure the absorbance of 10 samples from the same batch. Values A1, A2, A3, A4A10. If the absorbance value exceeds 0.2~0.8, the test should be repeated.

4.6 Experimental Data Processing

4.6.1 Absorbance value per unit mass Based on the linear relationship between the iron content in the test solution and its absorbance value, the following calculations are expressed in terms of absorbance value Xi per unit mass. The absorbance value Xi per unit mass of the sample is calculated according to formula (1). Xi= Ai mi (1) In the formula. Ai

--- the absorbance value of the i-th test solution; mi

--- the mass of the i-th sample, in grams (g).

4.6.2 Average absorbance value per unit mass The average absorbance value per unit mass of the sample, X, is calculated according to formula (2). X= (X1 X2 X3 X10) (2) In the formula. X1X10

--- Absorbance values per unit mass of 10 samples.

4.6.3 Standard deviation of absorbance value per unit mass The standard deviation S of the absorbance per unit mass of the sample is calculated according to formula (3). S= (X1-X)2