ICS 65.120
CCS B46

NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB 36897-2018

Feed additive - L-Arginine

饲料添加剂 L-精氨酸

Issued on: December 28, 2018 **Implemented on: January 1, 2020**

Issued by: State Administration for Market Regulation;
Standardization Administration of the PRC

Table of Contents

Foreword

Clause 1, Clause 4 and Clause 6 of this standard are mandatory; the remainder is recommended.

This standard is drafted in accordance with the rules given in GB/T 1.1-2009.

This standard was proposed by, and is under the jurisdiction of, the Ministry of Agriculture and Rural Affairs of the People's Republic of China.

The drafting organisation of this standard is the Shanghai Institute for the Control of Veterinary Drugs and Feed.

1 Scope

China's mandatory national standard for L-arginine sold as a feed additive. Arginine is one of the amino acids that a fast-growing pig or broiler cannot make quickly enough for itself, and feed formulators buy it by the tonne to close the gap between what a cereal-based ration supplies and what the animal actually needs. Because it is bought as a pure substance and mixed into feed at low inclusion rates, the buyer has no way of judging it by eye: two white crystalline powders look identical whether one is the L-isomer at full strength and the other is cut with something cheaper or carries a load of heavy metals. This standard is what makes the trade possible. It fixes the identity of the product through its chemical name, molecular formula, relative molecular mass and structural formula, sets out the appearance and the physical properties, and defines the technical indicators the material has to meet - assay on a dry basis, specific rotation, clarity and colour in solution, pH, chloride, heavy metals as lead, total arsenic, loss on drying and residue on ignition. It then gives the test method for each of those indicators, from the infrared identification test through the non-aqueous titration of the assay to the colorimetric determinations of the impurities, and closes with the inspection rules, the labelling, the packaging, the transport and storage conditions and the shelf life. It applies to feed additive L-arginine obtained by hydrolysing protein raw materials such as human hair, livestock and poultry hair and feathers, or by fermenting raw materials such as starch and then extracting the product.

This standard specifies the requirements, test methods, inspection rules, label, packaging, transport, storage and shelf life of the feed additive L-arginine.

This standard applies to the feed additive L-arginine obtained by hydrolysing protein raw materials such as human hair, livestock and poultry hair and feathers, or by fermenting raw materials such as starch and then extracting the product.

2 Normative references

The following documents are indispensable for the application of this document. For dated

references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

GB/T 601 Chemical reagent - Preparations of standard volumetric solutions.

GB/T 602 Chemical reagent - Preparations of standard solutions for impurity.

GB/T 603 Chemical reagent - Preparation of reagent solutions for use in test methods.

GB/T 6435-2014 Determination of moisture in feeds.

GB/T 6438 Animal feeding stuffs - Determination of crude ash.

GB/T 6682 Water for analytical laboratory use - Specification and test methods.

GB 10648 Feed label.

GB/T 14699.1 Feeding stuffs - Sampling.

3 Chemical name, molecular formula, relative molecular mass and structural formula

Chemical name: L-arginine.

Molecular formula: C6H14N4O2.

Relative molecular mass: 174.20 (according to the 2016 international relative atomic masses).

The structural formula is given in the standard.

4.1 Appearance and properties

The product is a white crystal or crystalline powder, almost odourless, with a characteristic taste.

The product is readily soluble in water, almost insoluble in ethanol, and readily soluble in dilute hydrochloric acid.

4.2 Technical requirements

The technical indicators shall comply with the requirements of Table 1.

Table 1 fixes nine indicators: the L-arginine content on a dry basis, the specific rotation, the clarity and colour of the solution, the pH, the chloride content as chlorine, the heavy metals content as lead, the total arsenic content, the loss on drying and the residue on ignition.

5 Test methods

Unless otherwise specified, the reagents and the water used in this standard are

analytically pure reagents and water of grade three as specified in GB/T 6682. Unless otherwise specified, the standard volumetric solutions, the standard solutions for impurity determination, the preparations and the products used in the tests are prepared according to GB/T 601, GB/T 602 and GB/T 603. Where the solvent of a solution used in the tests is not stated, it is an aqueous solution.

5.1 Appearance and properties

A suitable quantity of the sample is placed in a clean, dry white porcelain dish and its colour and physical state are observed, and its odour noted, in natural light.

5.2 Identification test

The identification is made by infrared spectrometry: the sample is ground with spectroscopically pure potassium bromide and pressed into a disc, its infrared spectrum is recorded, and that spectrum shall agree with the spectrum of the reference substance (the spectrum is given for information in Annex A).

5.3 Determination of the L-arginine content

The content is determined by non-aqueous titration: the sample is dissolved in anhydrous formic acid and glacial acetic acid, crystal violet is used as the indicator, and the solution is titrated with perchloric acid standard volumetric solution until the colour changes from blue to green, a blank test being carried out by the same method.

The L-arginine content on a dry basis is calculated by Formula (1) from the volumes of titrant consumed by the sample and by the blank, the concentration of the titrant, the mass of the sample and the moisture content of the sample. The result is taken as the arithmetic mean of parallel determinations.

5.4 Determination of the specific rotation

The instrument is calibrated before each determination using hydrochloric acid solution as the blank solvent. The sample, dried to constant mass, is dissolved in hydrochloric acid solution and made up to volume, the temperature of the solution is brought to equilibrium, and the rotation of the sample solution is read on a polarimeter, the mean of three readings being taken.

The specific rotation is calculated by Formula (2) from the measured angle of rotation, the length of the polarimeter tube and the mass concentration of L-arginine in the solution.

5.5 Determination of the clarity and the colour

The sample is dissolved in water. Using water as the reference, the clarity of the solution is observed against a black background and its colour against a white background.