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Technical specification for project-level assessment of greenhouse gas emission reductions - Ruminant feeding optimization

基于项目的温室气体减排量评估技术规范 反刍动物饲喂优化

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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. 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 by the Ministry of Agriculture and Rural Affairs of the People's Republic of China. This document was prepared by the National Technical Committee on Standardization of Animal Husbandry (SAC/TC274) and the National Technical Committee on Standardization of Carbon Emission Management. (SAC/TC548) jointly under the jurisdiction of the State Administration of Taxation. This document was drafted by: China Agricultural University, Modern Farming (Group) Co., Ltd., Cargill Investment (China) Co., Ltd., and Dongying Aoya Modern Farming Co., Ltd. Dai Ranch Co., Ltd., Zhongnong Carbon Earnings (Beijing) Consulting Co., Ltd., Inner Mongolia Mengniu Dairy (Group) Co., Ltd., Inner Mongolia Shengmu High Kemuye Co., Ltd., China Dairy Industry Association, China Dairy Products Industry Association, Beijing University of Agriculture, Feed Research Institute of Chinese Academy of Agricultural Sciences, Beijing Jingwa Agricultural Technology Innovation Center. The main drafters of this document are. Wang Wei, Li Shengli, Luo Chenglong, Wang Qianqian, Zhang Xue, Zhao Meng, Li Yi, Guo Wangshan, Yang Ku, Zhang Haicheng, and Gong Lei. Yan Fuwei, Cheng Xiaofei, He Yongqiang, Liu Gaofei, Zhou Zhenfeng, Huang Haifeng, Yue Zengjun, Jiang Linshu, Dong Lifeng, and Pu Xiangshu.

To facilitate domestic and international exchange, and in accordance with the relevant requirements of the Intergovernmental Panel on Climate Change (IPCC), the values in this document are... Units are expressed in the form of "International Units of Measurement for Substances (Elements)" or "Substance (Element) International Units of Measurement," such as kg CH4. tCO2e represents kilograms of methane, tCO2e represents tons of carbon dioxide equivalent, etc. Technical Specifications for Project-Based Greenhouse Gas

Emission Reduction Assessment Optimization of Ruminant Feeding

1.Scope This document defines the terminology used in assessing greenhouse gas emission reductions based on ruminant feeding optimization projects, establishes assessment principles, and stipulates... It includes the assessment process, emission reduction calculation, data acquisition, monitoring and data quality management, and the preparation of emission reduction assessment reports. This document applies to the assessment of greenhouse gas emission reductions achieved through feeding optimization projects in ruminant farms such as cattle and sheep.

4 Principles for Emission Reduction Assessment

4.1 Correlation Select appropriate greenhouse gas sources, data, and methods.

4.2 Integrity This includes all relevant greenhouse gas emissions that are adapted to the needs of the target users.

4.3 Consistency It enables meaningful comparisons of information related to greenhouse gases.

4.4 Accuracy Minimize bias and uncertainty as much as possible.

4.5 Transparency Subject to compliance with national policies and trade secret requirements, publish fully applicable greenhouse gas information to enable target users to make informed decisions. Reasonable decision-making.

4.6 Conservatism Ensure that the assumptions, figures, and assessment methods used do not overestimate greenhouse gas emission reductions.

5 Emission Reduction Assessment Process

5.1 General Requirements The project should improve the efficiency of nutrient supply to ruminants through feeding optimization measures, reduce emissions of greenhouse gases such as methane, and avoid introducing harmful substances to animals. Interventions that have adverse effects on plant health, production performance, or the environment. Emissions reduction assessments should be based on reductions in gastrointestinal methane emissions, using the actual methane emission difference between the baseline and the project scenario as a benchmark. The accounting is carried out on the basis of this.

5.2 Evaluation Procedure The greenhouse gas emission reduction assessment procedure based on the ruminant feeding optimization project is shown in Figure 1, and mainly includes.

a) Defining the project boundaries;

b) Identification of greenhouse gas sources;

c) Project and baseline scenario determination;

d) Data acquisition;

e) Emission reduction calculation;

f) Project monitoring;

g) Data quality management;

h) Preparation of emission reduction assessment reports, etc. Figure

1.Flowchart of the project-based greenhouse gas emission reduction assessment procedure.

5.3 Determining Project Boundaries The project scope covers changes in the selection of dietary ingredients, nutrient formulation, and animal husbandry management during the preparation and feeding management of ruminant feed. This results in methane emissions from gastrointestinal fermentation in ruminants. The project boundaries and emission sources/mitigation pathways are shown in Figure 2.

Note. Greenhouse gas emissions and ruminant mortality from the raw materials required for ruminant feed preparation and feeding management during planting, collection, processing, and transportation. Greenhouse gas emissions generated during the treatment of manure after feed processing are not included in the boundary scope.

Note. The black dashed box indicates potential methane emission reduction pathways during ruminant feed preparation and feeding management. The black bold solid box represents the project. System boundary, solid arrows represent material flow; parameters (NDF, GE, DE%, DMI) within the dashed boxes inside the boundary represent changes caused by feeding optimization and their impact on the gut. Key factors in methane emissions from fermentation; the rounded solid box indicates the methane emission sources calculated for the project.

6 Calculation of project emission reductions

6.1 Calculation of baseline emissions Within a certain period, methane emissions (BE) under the baseline scenario are calculated according to formula (1).

6.2 Calculation of Project Emissions The methane emissions (PE) under the project scenario within a certain period are calculated according to formula (2).

6.3 Emission Reduction Calculation The emission reductions generated by the application project scenario within a certain period are calculated according to formula (3).

7 Data Acquisition

7.1 Activity Data Acquisition Activity data for ruminant feeding optimization projects should

include the following.

a) Data type The types and numbers of ruminants using feeding optimization measures within the project boundaries, feed dry matter intake (DMI), and animal production Production data such as labor levels (body weight, milk production, etc.) and project operation days; NDF content, total energy (GE), and feed digestibility in the diet. Information on the nutritional components of diet formulations, such as digestibility (DE%).

b) Data Source Production data should prioritize data from farm production records, automatic data collection platforms for feeding systems, and diet formulation management systems. Manual data; if automated recording is not available, data can be collected through field surveys and review of feeding records; ration formulation The nutritional composition should be based on laboratory test data, and the total energy intake of ruminants per day can also be determined according to Appendix A, A.2.1. Obtained through calculation.

c) Data Requirements All data should be traceable and verifiable, and records should be kept complete, consistent, and authentic.

7.2 Obtaining methane emission factors from gastrointestinal fermentation in ruminants (hereinafter referred to as methane emission factors)

7.2.1 Methane emission factor under baseline scenario When historical methane emission factor data is available, a baseline should be established based on this data. Priority should be given to using data from the year prior to project implementation. Methane emission factors are obtained or calculated from farm ledgers, statistical reports, and related records. The acquisition of methane emission factors shall be carried out in accordance with Appendix A.1. Okay, the calculation will be performed according to A.2. When historical methane emission factor data is unavailable, the default methane emission factor value should be used. The default value shall conform to GB/T 32151.22- Obtain from Table C.3 of the 2024 guidelines; if nationally published data is unavailable, it is advisable to adopt the methane emission factors in the IPCC guidelines as outlined in A.3. Sub-default value.

7.2.2 Methane emission factor under project scenario The determination of the methane emission factor for a project scenario should follow this order.

a) Methane emission factors obtained through field measurements during project implementation shall be given priority, and the measurement methods shall comply with the requirements of A.1;

b) When data cannot be obtained through actual measurements, ruminant production information under the project scenario and the optimized diet formula nutrition can be used as a reference. Based on the composition data, the methane emission factor was calculated according to A.2;

c) If the methane emission factor cannot be obtained through