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

GB/T 29402.1-2012

**Storage of cereals and pulses -- Part 1: General
recommendations for the keeping of cereals**

谷物和豆类储存 第1部分：谷物储存的一般建议

(English Translation)

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Foreword

GB/T 29402 "stored cereals and pulses" is divided into three parts.

- Part 1. General recommendations grain storage;
- Part 2. Practical recommendations;
- Part 3. Pest control.

This is Part 1 GB/T 29402 of.

This section according to the rules GB/T 1.1-2009, GB/T 20000.2-2009 given draft.

This section uses the translation method identical with ISO 6322-1:1996 "cereals and legumes storage part --- 1. General construction of grain storage Yee "(in English).

This part made the following editorial changes.

- The "ISO 6322 this part" to "this Part";
- The English decimal point "," to ".";
- "State" with "developing countries" and to "regions", "underdeveloped regions";
- Remove the individual is not suitable for China's comment Words such as "such as South America and the Middle East" and "such as Europe," and so on;
- Delete the original standard introduction.

This part is proposed by the National Food Authority.

This part of the National Grain and Oil Standardization Technical Committee (SAC/TC270) centralized.

This section drafted by. National Food Authority Standard Quality Center, Henan University School of foodstuff.

1 Scope

This section GB/T 29402 gives general guidance recommendation grain storage.

This section applies to stored grain.

2 Normative references

The following documents for the application of this document is essential. For dated references, only the dated version suitable for use herein Member. For undated references, the latest edition (including any amendments) applies to this document.

ISO 5527:1995 cereal Vocabulary GB/T 29402.2 Cereals and pulses Storage - Part 2.

Practical recommendations GB/T 29402.3 Cereals and pulses stored Part 3. Pest control

3 Terms and Definitions

ISO 5527:1995 define the following terms and definitions apply to this document.

Relative humidity at the same temperature, water vapor pressure and saturation vapor pressure of the air sample rate.

4.1 Technical Factors

Grain storage problem usually occurs in two distinct stages, see 4.1.1 and 4.1.2.

4.1.1

freshly harvested grain, and sometimes moisture content to maintain a high state time can vary from a few hours to several months, when grain traits Very unstable, the general store on the farm or small, there is not enough equipment, inadequate storage conditions of silos or storage room, waiting for the right deal with.

4.1.2

the trade market stage, the grain can be stored at no higher than the safe moisture situation several months to several years, in various regions of each grain Safe moisture content can be constant. Grain can be equipped with modern legislation Silo storage of large enterprise storage, or Stored by other bulk storage facilities. Q. Due to the different storage methods, conditions, location and expected shelf life, which may occur during storage Questions will

be different.

4.2 Environmental and socio-economic factors

In terms of grain storage, different geographical areas have their own unique problems. Causes of these unique problems, see 4.2.1 - 4.2.3.

4.2.1 Climatic conditions

Growth from the field to the final use of the whole process of climatic conditions is one of the most important factors affecting grain quality.

Geographic area can be broadly classified as follows.

- a) hot and humid tropical climate zones. the region will soon be rotten bad cereal;
- b) hot and dry climate zones. the region when the grain harvest has been dried naturally, the problem is relatively simple, but if the long grain harvest Maintained at high temperatures, pests exacerbated erosion problems;
- c) temperate climate zone. Some grain moisture content of the harvested within the region may be higher;
- d) cold climate zones. the region will be very special problems, such as a period of time the grain will be buried under the snow.

Often the case that some of the poor climate is not conducive to prevent grain spoilage or deterioration.

Import and export activities 4.2.2 States Cereal production in all countries are facing the question of how the state has other stockpiles of grain in farm import and export activities, in particular Exporting countries, should be used to transport grain storage facilities. Grain exports shall normally comply with national or importing country's official institutions to develop very strict Grid standards (particularly indicators on microorganisms and insects). It should be noted that, for many exporting countries to maintain storage facilities, equipment, low Cost is very important.

4.2.3 Technical Management Status

Some of the less developed regions of the many issues there is not enough understanding, nor the capacity to deal with these issues. With modern harvesting technology Development (for example, combines the use of) the initial storage of high moisture grain (4.1.1) situation has improved significantly.

Depending on the size of storage facilities, organization and management of the storage system is very important. There are a lot of grain may cause real and logistical problems.

Currently, in the same area, different types, different skill levels of storage system (bulk or

packaged) exist.

Ideally, respectively, depending on stored grain moisture content to avoid drying high-moisture grain and blended grain storage.

4.3 Quality Factors

It should be based on end-use (eg. for human consumption or as feed, raw grain or refined grain, edible or non-industrial use of grain) grain is determined Whether it is in good condition.

National usually specified quality requirements and quality standards. For example, the quality of the grain itself and foreign substances (heterogeneous food grains from insects or Rodent waste, pesticides or toxins) limited standards.

Mandatory standards of the importing country has a significant impact on exporting countries storage, facilities more primitive areas meet these criteria Requirements may be some difficulties.

Although each region has its own problems, but because of the commodity trade has a strong common, and many of the problems in science and technology level is similar , So, based on existing knowledge can be developed guidelines for safe storage of grain.

5.1 Cereal grain is a living organism

Grain cereal caryopsis dormancy is alive. It embryo and aleurone layer have slow metabolic activity, the metabolic activity in the environment it will quickly accelerate when appropriate. Consisting essentially of endosperm cells stored substances (carbohydrates, protein and a small amount of lipid) composition for metabolism Provide energy.

The basic metabolic activity of grain into two categories, namely, respiration and germination.

5.1.1

respiration, mainly affecting the carbohydrates and lipids. In aerobic conditions, if the grain moisture content and temperature are high, Respiratory Metabolism occurs. Respiratory Metabolism grain produce carbon dioxide, water vapor and oxidation lot of heat (per mole of glucose production 2830kJ).

Under anaerobic conditions, fermentation metabolic processes occur, resulting in less heat (produced per mole of glucose 92kJ). Fermented cereal has Depending on the initial moisture content and temperature. Since the grain heap outside temperature changes or heat inside the heap of grain, grain bulk surface and internal temperature Always different. So, between the relative humidity and moisture content of the establishment of a balanced gradient. Water temperature shift to the lowest position so that the position was increased moisture content.