

Call for scientific justification for lower moisture content in FDEAS 2:2011

Introduction

Maize is by far the most important food crop in Kenya and a major cross-section of eastern, southern and central African countries. In some countries like Kenya, any reference to shortage of food is a direct reference to the shortage of maize. At the peak of food shortage in Kenya, there emerged among the population a clarion call for an Unga Revolution. The Unga in this case is a reference to maize meal. In a number of some countries, there have been maize meal riots either due to lack of it or increases in prices which made it impossible for the larger cross-section of citizens access the maize meal.

Realizing the crucial role of maize in food trade and food security in East Africa, the first harmonized standard was issued as EAS 2:1999 with four grades and a moisture content of 13.5 % m/m. This standard was closely related to standards in India, Philippines and the USA.

First Revision of EAS 2, 2005

In 2005, EAS 2:1999 was revised. The major changes were in the reduction of grades from four to two on the basis of reducing varieties, confusion and greater consumer protection. It was argued at that time that Grades 3 and 4 had parameters which were more fit for animal feed than human food. The standard also expanded the varieties of maize from the previous two (white and yellow) by adding the red variety and clearly defined the limits for admixtures. It expanded the clause on undergrade maize for more clarity.

The parameter for moisture content was retained at 13.5 % m/m for both grades.

Second revision of EAS 2, 2011

In 2005, EAS 2:2005 was revised. The major changes were in the expansion of the grades from two to three. The rationale for this change was based on the experience in the region where the majority of farmers are small scale and do not have facilities to achieve higher purities which in any case had not been demonstrated as having food safety risk. The standard contains an expanded clause on general requirements to clarify on the minimum requirements for maize grains.

The parameter for moisture content was changed from 13.5 % m/m to 13.0 m/m for all grades.

Loss of grain in storage

More grain is lost because of improper storage than for any other reason. Most common problems are as follows:

1. Inadequate observation of grain during storage: not checking grain frequently.
2. Improper grain management, not using aeration to control grain temperature.
3. Pockets of fines (broken kernels, weed seeds and trash) restrict airflow and provide food for insects and mold.
4. Grain began to deteriorate because it was held too long without adequate aeration prior to drying.
5. Improper cooling of grain after drying. Grain must be dry and cool before storing.
6. Poor initial grain quality or not dried to a safe moisture content.
7. Improper or lack of insect control.

The moisture content issue

It is scientifically acknowledged that maize is a perishable commodity with a limited shelf life that depends on the moisture content and temperature of the corn. "Shelf Life" is the length of time good quality, aerated shelled maize can be stored before losing 0.5 % of dry matter. With this amount of dry matter decomposition, it is assumed that the corn loses some quality, but maintains its market grade.

The CODEX Alimentarius Standard, CODEX STAN 153:1995 sets the moisture content for dry maize grains at 15.5 % m/m maximum. The Codes standard recognizes that lower moisture limits should be required for certain destinations in relation to the climate, duration of transport and storage. Governments accepting the Codex Standard are requested to indicate and justify the requirements in force in their country.

The moisture content problem

Most damage that occurs in maize grains during storage is caused by moulds and insects. Grain spoilage occurs as microorganisms feed on the nutrients in the grain. As they grow and develop, these microorganisms produce heat, which increases the temperature of the surrounding grain. This heating may result in hot spots.

If the temperature and moisture are just right, the major mould species *Aspergillus*, *Fusarium* and *Penicillium* may produce mycotoxins such as aflatoxin, fumonisin, DON (De-Oxy-Nivalenol = Vomitoxin) and zearalenone. These mycotoxins can cause serious illness and even death when consumed by humans or animals. The presence of mould does not mean that the mycotoxins will be present, but rather the potential exists for their development with the right combination of temperature, grain moisture content and storage time. Even more frustrating is the fact that the absence of mould does not guarantee that mycotoxins are not present. This is because the growth of the mould may not be extensive enough to cause visible damage, but nevertheless, it can still produce toxins.

In setting the parameter for moisture content, it is prudent to determine the storage time, period of transportation and existing humidities. In some jurisdictions, scientific studies have shown that moisture content can be set as follows:

Shelled maize & sorghum	Max. safe moisture
To be sold within 6 months	15 %
To be stored up to 1 year	14 %
To be stored more than 1 year	13 %

Scientifically justified moisture content for maize in East Africa

While the moisture content of 13 % was set with good intentions, Kenya has faced problems while importing maize from neighbouring countries and other countries in the continent and beyond. Furthermore, it is not practical to expect small scale farmers who only use the sun to dry the maize to achieve the 13 % moisture content level. Maize from South Africa, the USA, Malawi, Zambia and a host of other countries has been rejected in the past on the basis of high moisture content than any other parameter.

What has always been outstanding is the lack of scientific justification for the 13.5 % parameter. With 13.0 %, we risk aggravating the problem further since our farmers will now be required to use artificial drying facilities which they do not have. It should also be remembered that most of the maize is actually consumed within 6 months of harvest.

Purpose of this communication

This is an appeal to all stakeholders within the East African Community and trading partners to provide scientific justification for the setting of moisture content different from that set in CODEX STAN 153:1995.

Kindly submit such information through the Contact Persons indicated in this web-portal.