NSUK Journal of Science & Technology, Vol. 6: No. 1. 2016. pp. 150-152 ISSN: 1597- 5527

CONTAMINATED GRAINS, CAUSES AND PREVENTIVE ACTIONS: AN OVERVIEW

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ABSTRACT

Contaminated grains are harvested grains that have been subjected to unethical treatment in storage and could cause irreversible injury to man, livestock etc. Contaminated grains are occasioned by the nature of the dangerous synthetic chemicals administered to the grains and consumed by human being/livestock. This often results in terminal diseases like cancer or immediate death of the consumer. Causes of contaminated rains include pest infestation (which could inflict toxic chemicals from the body of the pests), overdependence on synthetic chemicals, illiteracy, wickedness of grain merchants/handlers, bad handling/storage practices, sporadic hike in cost of grains, marketing of grains with other dangerous products, lack of quality control set for marketing of grains, poverty, no enforcement of appropriate laws and wrong method of chemical application. The problem can be significantly abated by employing preventive measures (such as high level store hygiene, cultural practices, drying grains to safe moisture content before storage etc). Control measures involving professional, judicious but limited use of synthetic chemicals will also go a long way to reduce the problem. The adoption of integrated pest management system by farmers and grain handlers is also necessary if this menace is to be tackled efficiently. Combine efforts of relevant governmental agencies, agro-chemical manufacturers and distributors, grain merchants and non-governmental organizations are required to deal with this ugly demon.

Keywords: contaminated grains, synthetic chemicals, integrated pest management system,

INTRODUCTION

Grains are small hard seed of food plants genetically grown for their edible and industrial uses. The starchy and proteinous seeds are utilized for feeding human and livestock or as raw materials and products of agro-based industries.

Grains are the most important agricultural products stored by small-scale farmers in the tropics and sub-tropical regions of the world, as they constitute a class of crop/agricultural produce that are durable (Lale, 2002). Grains constitute an important and indispensable component of human and livestock food on which living is sustained.

Okunade (2006) identified and stressed this observation by the phrase ‘’no grain no life.’’ Grains constitute cereals, i.e. seeds (composed mainly of carbohydrates) e.g. maize, rice, millet, sorghum and legumes, i.e. (composed of proteins) e.g. beans (cowpea), soybean, groundnut, bambara nuts etc. This important agricultural commodity found usage in quite a number of uses for human and livestock.

Examples include. a) Food - Solid, drinks and children feed – livestock feed. b) Raw materials for agro-based industries e.g. flour mills, oil mills etc. c) Production of consumable items like gum, starch, dyes, plastic/rubber materials, lubricants etc. Like other agricultural produce, grains are in abundance and cheaper during their harvest period but scarce and expensive at off-season.

Man is therefore compelled to store them when abundant against their off period. In attempt to achieve this, man has often resorted to so many unethical practices that end up compromising the gains and hence the advent of “Contaminated Grains” the consequences of which are irreversible, instant injury to man and livestock or gradual and cumulative injury whose effect manifest at the long run (Okunade, 2006). The incidence and effects of contaminated grains over the years in our environment had been worrisome and is assuming an alarming proportion.

Notable examples of these include the killer beans episode of 1995 (in some parts of northern Nigeria and Lagos), millet poisoning in “fura” reported from northern Nigeria in 2000 and the bean cake poisoning in Katsina State that killed 16 people in 2005. This review attempts to examine the possible causes, propose preventive approaches and discuss recent developments to curb the incidence of contaminated grains.

The emergence and spread of this ugly situation is traceable to the fact that production, harvesting and storage of grains have been left in the hands of the illiterate resource-poor farmers at the village level who are often being manipulated by the dubious, supposedly rich but unpatriotic merchants.

The Contaminated Grains

These are harvested grains that have been deliberately (or otherwise) subjected to bad treatment in an unethical manner. The scourge of contaminated grains has been felt over the years in a number of countries including Nigeria. This dates back to early 90s and in recent times. Examples include: a) In 1995, many people died in Lagos after consuming beans/products made from such produce. b) In early 2000, it was reported in a Northern State that some people smell chemical suspected to be “Gammalin 20” (Lindane) in “Fura” made from millet (Abba, Personal Communication). c) In Katsina State in year 2005, media report confirmed that a total of 16 people died after consuming bean cake made from affected beans. This is in addition to those that died in the same town from a similar incident. d) It was also reported in Sokoto State around late 90s that many people died after consuming bean cake.

Why Does “Contaminated Grains Kill

Contaminated grains resulting especially from synthetic chemicals could kill man or livestocks immediately or gradually because of the following reasons: a) After ingestion and assimilation of the products of contaminated grains into the body system, symptoms such as headache, nausea, giddiness, blurred vision, dry cough, choking or vomiting sensation, loss of muscles co-ordination, excessive lacrimination, salivation etc results.

If the situation is not unattended promptly, death may occur. b) Consumed killer grains go straight into the blood stream after digestion is completed. Since most of the synthetic chemicals are both contact and synthetic in action, with rapid anticholinesterase action, they therefore possess very rapid effect on the body system of any living organisms including man and animals even at low rates.

This could result in heart failure, fragmentation of the

intestine, blockage of blood vessels, etc. c) Some of these synthetic chemicals could accumulate in the body system for several years and ultimately result to terminal diseases such as cancer, kidney or liver infection etc. (Okunade, 2004).

d) Most of the synthetic chemicals (especially those exclusively meant for field crop) are very strong and if applied directly on stored grains, goes directly into the cells and tissues of the grain. No amount of washing could remove the chemical, hence, people die after consuming such grains even after processing for food.

Cure (Remedy) For Contaminated Grains

a) Preventive Measures

- Select good pest resistant grain varieties for storage.
- Avoid use of chemicals on farm very close to harvest.
- Harvesting grains at the right time.
- Store clean unbroken grains.
- Use good threshing method.
- Observe store hygiene throughout the storage period. Don't store old and new grains together.
- Dry grains to safe moisture content before storage. Regular inspection of stored grains.
- Use rodent – proof facilities on storage structures. ? Buy grains for storage at the right time (at harvest).
- Best storage method that is in conformity with the size, purpose of storage and prevailing situation should be employed.
- Observe the rules of good storage practices. These include first-in-first-out; last-in-last-out etc (Okunade, 2006).

b) Control Measures

i) Traditional Method:

- Sorting, Sifting, Drying and Re-drying of grains where necessary before and or during storage.
- Admixture with plant materials. These include neem tree products, Ocimum spp., wood ash etc. (Ofuya, 1986, Ajayi et. al. 1987).

ii) Chemical Method: This is suitable especially for large scale storage and involves the use of synthetic chemicals of suitable formulation, liquid, solid (granulated, compressed gas or powder) and/or gas or the combination of these as found suitable for the purpose.

Extreme care has to be taken in utilizing this method because of the potential danger that could arise from it. Moreso, it has been abused over the years. These explains the reason why the use of synthetic chemicals on stored grains is gradually being discouraged and the use of other safe methods becoming more and more popular. Lale and Okunade (1998) reported that the use of dangerous synthetic chemicals on food (grains inclusive) has either been banned or drastically restricted in developing countries. In selecting the synthetic chemical to be used, such chemical must, among other things, meet all or most of the following requirements:

- must not expire;
- not among the banned or heavily restricted chemicals;
- genuine – not fake or adulterated;
- not leave harmful residue on the grains;
- must be environmental friendly;
- application must be done by trained expert (Okunade 2009).
- Where fumigant tablets are involved, they should be wrapped in paper or placed in match box to prevent the resulting powder from mixing with the grains.
- Chemical application should begin no later than two weeks of putting the grains in the store.
- The waiting period, length of time between chemical application and consumption, should be strictly observed.
- The chemical(s) to be used must be those exclusively meant for stored products and not field chemicals.

After applying chemical judiciously, this should not be an excuse for not taking other necessary precautionary measures, including maintaining high level store hygiene during the storage period.

iii) Non-Chemical Methods: These are cheaper, safer and if properly managed, could be more effective on small and large scale. Some of these include:

- Use of hermetic (air-tight) storage structures e.g. plastic/metal drums, tins, cans, jerry cans, triple nylon bagging etc. on small, medium or large scale as the case may be.
- Storage of grains on head/cob/in pod – i.e. storing unthreshed grains either in bags, rhombus etc.
- Smoking – by hanging unthreshed grains over cooking spots.

iv) Integrated Pest Management (IPM) Strategy: This has to do with the use of a combination of various methods. It frequently entails minimal use of chemicals as against non-chemical methods as preventive measures and it is highly encouraged. This method is gradually gaining grounds globally. It is cheaper and safer to use when properly managed, IPM strategy could proffer lasting solution to the killer grains issue.

CONCLUSION AND RECOMMENDATIONS

In view of the fact that storage of grains is still being done by the resource – poor farmers, the occurrence of contaminated grains will remain unabated and on the increase in the third world countries. In fighting this, all hands have to be on deck to ensure success. Collective actions of the various stakeholders; farmers, research scientists, agro-chemical companies, consumers, governmental and non-governmental organizations. To this end, the following recommendations are presented for consideration and implementation by these concerned stakeholders.

a) Public enlightenment/education of various stakeholders e.g. farmers, merchants, labourers, consumers etc.

b) Grain storage practices should be handled/supervised by experts to avoid contamination or otherwise of the grains destined for storage.

c) The various laws at Local, State and Federal levels should be tightened and enforced by all means. Where necessary, appropriate laws should be put in place at local levels to check the practices of chemical usage.

d) The market for grains meant for immediate consumption should be separated from that of other dangerous products such as agro-chemical.

e) The cost of synthetic chemicals and other inputs used in grain storage should be subsidized. Moreover, genuine chemicals/equipments should be made available especially at designated places for ease access to farmers and merchants.

f) There should be strict control at our border posts,

especially our grain producing neighbor country. This will reduce incidences of influx of chemicals meant for one region across to others.

g) Standard should be set for grains destined for sale in the open market. Such grains should be properly screened by experts before being allowed entry to the market for sale.

h) Extension services should be established for grain storage at subsidized prices. This will bring the services of the grain storage experts closer to the masses.

i) In view of the fact that majority of the cases of the killer grains are traceable to synthetic chemicals, integrated pest management approach should be adopted in grain storage. The system encourages the use of cultural and high level hygiene with less emphasis on the use of chemicals.

If well implemented, these suggested measures will go a long way in abating the incidences of killer grains in Nigeria and even beyond.

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