

Traditional Processes of Food (Fresh and Dried Fruits) Production and Storage in Afghanistan and Their Impact on Humans' Health

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ABSTRACT

Humans and animals have always had hard time for surviving. Their lives have been threatened on adverse ways, including the consumption of unhealthy food and in situations where food safety is not guaranteed. An example of such threaten on human life in third world countries like Afghanistan is due to the lack of awareness about healthy food, their productions, preservations, and consumptions. There are types of food which can easily get infected by fungi and those fungi are called Aflatoxin, and they are harmful to both humans and animals. Such types of harms nowadays threat the lives of Afghan citizens as they are producing types of food (fresh and dry fruits) that can be easily infected by Aflatoxin. This paper investigates Aflatoxin fungi and the substances that easily get infected with it and how they produce toxins in humans and animals food. The findings from the present study helps us know the harm as well as ways of preventing fungi in most Afghan fruits and can avoid eating food that are contaminated with Afalatoxin.

KEYWORDS: Aflatoxin, Humans and animals, Fungi, Fresh and Dried Fruits, Food Safety, Cancer

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1. INTRODUCTION:

Dried fruits and nuts are the most important production and export items in the history of Afghanistan agriculture and economy. In particular, Afghanistan's dried fruits once had a dominant position in world markets before the war in Afghanistan in the 1980s. Afghanistan produces a wide variety of dried fruits and nuts alone, which has unique flavors that have attracted buyers throughout the region. Dried fruits production has played an important role in the post-2001 rebuilding, filling Afghanistan's export basket and establishing strong export growth foundations in the future.

Low levels of technology and the lack of modern methods of fruit harvesting, drying, and preserves of fruits in Afghanistan often cause these products to get infected by fungi (Aflatoxin) and spoil. In Afghanistan, processing of fruits and nuts drying are characterized by traditional methods, with none or low level of technology. The ability to upgrade process capacities is limited, and that is due to limited facilitates or lack of infrastructure, especially with restricting access of energy and power. Access to information about standards of fruits and vegetable products is a constraint to most Afghan farmers and crops processors.

As a result, the use of traditional techniques - taking into accounts the few requirements and preferences of the international market - leads to integrity and quality

deficiencies as well as serious food safety concerns (Kumar, Mahato, Kamle, Mohanta, and Kang 2017). In this sense, traditional techniques are relatively easy for Afghan farmers to produce their crops. However, lake of awareness about food safety, fruits toxins, fungi (Aflatoxin), and their types that causes death to humans and animals is significant, not just for the Afghan farmers but also for those who consume their crops in and outside the country.

2. LITERATURE REVIEW:

To know about Aflatoxins, one must be acquainted with about Aspergillus molds. Aspergillus molds grow on food such as grains, ginger and nuts, dried fruits, often in warm, humid environments, producing toxins called Mycotoxins that are harmful to animals', birds' and humans' health (Hudler, 1998). Among these toxins, Aflatoxin is of particular importance in food contaminants, as in most cases it can cause digestive and liver tumors, and it can have adverse effects on the immune and reproductive systems of human's body and even causes cancer (Nogueira, Foerster, Groopman, Egner, Koshiol, & Ferreccio, 2015). Because molds are common in nature, Aflatoxins can enter the process of cultivating, producing and processing many types of food, such as wheat (especially bread which are kept for few days), nuts (such as walnuts, pistachios, peanuts, other dried fruits) and even in livestock products (commonly dry meat).

In some cases milk and dairy products (through contaminated animal feed) and cause disease (Awasthi et al., 2012).

For this reason, the ongoing evaluation and careful control of Aflatoxin contamination in the process of producing, storing and distributing foods that are highly contaminated are of great importance in the health and food control system (Hudler, 1998). This level of oversight is carried out in many countries and regions of the world by strict scrutiny and enforcement of regulations and guidelines. But for Afghanistan, very less percentage of people may be aware about the harm of Aflatoxin and in contaminated food products. For most Afghan people who live in rural areas as well as in farms no single awareness program exist from the government or non-governmental organization side to let those societies to care about their food products.

In developed countries, extensive studies determine the acceptable levels of contamination in various food products and establish and apply regulatory agencies such as the US Food and Drug Administration and the European Union. The goal is to lower the acceptable amount in the production and distribution process as much as possible. The acceptable level of this toxin is determined by the type of Aflatoxin, the type of food, and the amount and form of use in humans or animals. Pradeepkiran (2018) stresses that of the types of Aflatoxins, type B-1 (Aflatoxin B1) is the most toxic and can enter the human body through moldy bread (especially wheat) and nuts (walnut, peanuts, other dried fruits) and can cause sickness which in overtime may trigger breathing problems and cancer, especially liver and gallbladder cancer (Aguilar, Hussain & Cerutti, 1993; Nogueira, et. al 2015).

Aflatoxin contaminants can reach the human food cycle through animal feed also. In livestock farming, an important part of the livestock feeds on processed foods such as maize, which can be even more dangerous than human food contamination (Hudler, 1998). The main derivative of the Aflatoxin toxin in milk is known as Aflatoxin M1 and, although weaker than type B-2, has similar pathogenic potency (Tosun & Arslan, 2013). Aflatoxin B-2 is absorbed from the animal's digestive tract through feed converted into animal L-2 derivative and enters the mammary glands and milk by blood. Thus milk and dairy products can become the main source of Aflatoxin (Awasthi et al., 2012).

3. STUDY OBJECTIVE:

The main objectives of this paper is to find answer to these research problems in mind, this paper will tries to answer questions like: What is Aflatoxin? Is it harmful to our health? How to be aware of and determine Aflatoxin? Do Afghanistan's fresh and dry fruits easily get contaminated with Aflatoxin? To what extent Aflatoxin is harmful for humans and animal? What are the best ways of avoiding food contamination?

4. METHODOLOGY:

The methodology applied in the present study is qualitative (i.e., library and documentary method) and it tries to relay on the documents that are available and suits to answer the states questions. The main reason that library research method is used in the presents study is that it is the most important tool in reviewing documents related to the research topic. In qualitative research such as meta-study

such as the present paper, a transcendental and meta-analysis method is widely used.

5. ANALYSIS:

The analysis includes investigation of the phenomenon traditional processes of food (fresh and dried fruits) production and storage in Afghanistan and their impact on humans' health through answering the related questions stated in study objectives section. Questions are one-by-one stated below and are responded and analysed.

5.1. What Is Aflatoxin? Is It Harmful to Our Health?

Aflatoxin is a type of fungi that has been around for a while and not many people knew about it to ask each other questions, if their health was really at risk. Aflatoxins are natural fungal contaminants that originate from fungal species such as *Aspergill Flavus*, *Aspergillus Parasiticus*, and *Aspergillus Nomius*. These fungi commonly infect walnuts, corn, or peanuts, and pistachios, while wheat, barley, and rice are more resistant to these fungi (Leong, Ismail, Latiff, Manaf, & Rosma, 2011). Aflatoxins infect humans through contaminated foods such as eggs, milk and dairy products and can be carcinogenic (Awasthi et al., 2012). In 1985, the US Food and Drug Administration determined the amount of Mycotoxins allowed in food.

Since most people in Afghanistan preserve food products, fresh for many days and dry for months and even year or store them to serve from one season to the other season without proper preservative substances, such types of food are always in danger to be contaminated by *Aspergillus* molds (Hudler, 1998). In most cases people remove the contaminated part of the food product and then they serve them without knowing how harmful they are for their health. There are many cases of cancer reported by the Afghanistan Ministry of Public Health recently. There are chances that most cases of the cancer are due to the Aflatoxin in fresh and dry food that are served by the people (Hudler, 1998; Nogueira, et. al 2015).

5.2. How to Be Aware of and Determine Aflatoxin?

In many countries in the world, including in the European Union, the maximum permissible level of Aflatoxin M-6 has been set at 4.4 µg / kg and 1.8 µg / kg dry milk. However, in countries like Afghanistan the level of Aflatoxin might be available in various types of food at a very high level. It is therefore, careful monitoring of the process of production and storage of human and animal food and animal products, ongoing tests to control and measure the levels of Mycotoxin contamination, especially Aflatoxin, are necessary to prevent the dangerous effects of these contaminants in underdeveloped countries, like Afghanistan.

5.3. Do Afghanistan Fresh and Dry Fruits Easily Get Contaminated with Aflatoxin?

To talk about dry and fresh fruits of Afghanistan, first it is required to discuss about Afghanistan's agriculture and food production. Agriculture forms the backbone of Afghanistan's economy. About 70 percent of Afghans living in rural areas work in agricultural fields and about 61 percent of households earn their living from the agricultural sector.

The population figures make up 21 percent of Afghanistan's GDP. Cereals, especially wheat, fruits and vegetables, are among the most important agricultural crops in Afghanistan,

but with the variety of crops in Afghanistan, most Afghans lack nutritional and an assortment of food on their tables to serve. There is an argument that the lack of nutritious food in most places of Afghanistan. Such kind of situation has caused food insecurity in one hand and on the other hand, it has caused malnutrition among Afghans. Most farmers collect their crops such as: wheat, corn, peas, and beans, etc. either they sell them immediately after their collection or most often they store them in traditional ways in places which are not appropriate for foods to be kept.

Lack of facilities and having traditional ways of storing food in Afghanistan has caused farmers spoil their crops or lose incomes over their efforts they make while cultivating varieties of food. At present, Afghanistan is the only one capable of preserving very few types of vegetables and fruits and it has built up to 3,000 small cold storage facilities. Akbar Rostami, a spokesman for the Ministry of Agriculture, has stated in the website of that ministry that they are working on establishing additional stores for fruits in addition to a number of stores to preserve dried fruits as to avoid contamination. "Currently, private companies have fresh fruit storage as refrigerator containers. The Ministry of Agriculture is trying to build larger cold storages across the country." At present, fruits are the other types of crops which are often sold as fresh, but due to the lack of market farmers store them under dry hays and in special homes for some time. It is often seen that contaminated food and fruits with fungus are bought and sold in markets.

5.4. To What Extent Aflatoxin Is Harmful for Humans and Animals?

As discussed earlier, Aflatoxin, found in many types of food and even bread. Afghans use bread with all their mealtimes and in most cases they normally bake it once for two to three days. Bread easily gets contaminated with fungus (i.e., Aflatoxin) and they are highly toxic and cancer-causing substance that has unfortunately caused many Afghans fall in bad health (Hudler, 1998).

As part of their cultural beliefs, Afghans respect all types of bread in common but wheat bread carries more value to them, so they never want to be disrespectful to throw bread in to the wastes. Mostly, they prefer to store them somewhere around their homes, store, dry and sell them without care if they are full of fungus and Aflatoxin to those who breed animals. Such people are mostly the farmers and they buy contaminated food for their cattle and animals. This toxin is one of the substances that is most contaminated with pistachio. Pistachios that appear to be high in moisture or bitter in flavor may contain some dangerous substance.

Most people develop moldy food such as bread and nuts that can be Aflatoxin-laden and unfortunately these poisons not only enter indirectly to their body, but also cause animals to carry the disease caused by the moldy food. When food such as dry fruits and bread is improperly stored, all of which are now Aflatoxins, they are replaced by dairy farms and given to animals as food, and the poison enters the human body from the animals. In other words, when contaminated food is processed, it enters the cycle of production of animal feedstuffs, agriculture, pet food, and ultimately human food (Hudler, 1998). Unfortunately, if these toxins enter the human body through food, there are higher chances that they cause cancer to humans (Nogueira, et. al 2015).

After entering the body, Aflatoxin may be metabolized and transformed by the liver. As such, it becomes a mild epoxy reactor with less risk to the body. Aflatoxins come in many forms and often enter through the body. Bao, Trucksess, and White (2010) have introduced three types Aflatoxin such G1, G2 and B1. Of course, B1 is the most toxic and can even be absorbed through the skin (Tosun & Arslan, 2013; Pradeepkiran, 2018). This allows us to know the sudden or restrictive growth of cysts in some human's liver. Human may use contaminated food but they can safeguard it. In general, there is no evidence to show how much fungus – Aflatoxins – really cause death to human. Aflatoxins can be considered the earth's harmless substances if humans care about their food and the ways they store their foodstuff (Pradeepkiran, 2018).

5.5. What Are the Best Ways of Avoiding Food Contamination?

There are a number of ways to avoid food combination of serving such food. For instance, when you buy nuts, pistachios, peanuts and flax, you need them for good storage conditions, and we shouldn't store them for more than a few months, and the storage should be cool and moisture free. When go for shopping, make sure that the purchased product is in good health. And always get your fruits and nuts out of your approved locations or places that are reputable (Leong, Ismail, Latiff, Manaf, & Rosma, 2011).

The use of industrial dairy products can also help ensure that Aflatoxins are not ingested through dairy products. Large dairy companies for all industrial input valves are checking through the concerned companies to prevent contaminated milk from entering the dairy plant. Here's a famous saying that prevention is better than cure, as long as you get all the attention you need and care about the food you eat, the toxin doesn't enter the body. But in some cases, these poisons enter the body due to inadvertent mistakes. Aflatoxin toxin is heat-resistant and dissolves at a temperature of 237 to 308 °C. Therefore, milk pasteurization cannot be effective against Aflatoxin M1 (Awasthi et al., 2012; Kumar et al., 2017).

In their study Awasthi, Bahman, Thakur, Singh, Dua, and Ganguly (2012) reported that neither pasteurization nor boiling milk decreased Aflatoxin M1 levels. Roasting pistachios at 90, 120 and 150 degrees C for 30, 60 and 120 minutes reduces Aflatoxin levels by 17 to 63 percent. In addition, alkaline cooking and corn soaking to tortilla reduce Aflatoxin levels by 52 percent.

For this reason, the evaluation and careful control of the amount of Aflatoxin contamination in the process of producing, storing and distributing foodstuffs are the most important components of the health and food control system (Kumar et al., 2017). This level of oversight is carried out in many countries and regions of the world by strict scrutiny and enforcement regulations and guidelines.

Extensive investigations into the acceptance levels of various food products and establish and apply regulatory agencies such as the US Food and Drug Administration and the European Union. The goal is to lower the acceptable amount of the production and distribution process as much as possible. The acceptable level of this toxin depends on the type of Aflatoxin, the type of food and the amount and form

of use in humans or animals. Mycotoxin contamination, especially Aflatoxin, is necessary to prevent and control the levels of Mycotoxin contamination, which are necessary for the maintenance and storage of human and animal food and animal products.

6. DISCUSSION

To discuss about harms of Aflatoxide in dried and fresh food, the first instance can be a reference during 1974, as a major outbreak which was reported in Gujarat and Rajasthan, India, which resulted in the deaths of four people (Sharma, Pothana, Prasad, Shah, Kaur, Bhatnagar, Chen, Raruang, Cary, J. & Rajasekaran, 2018). The incidence lasted for two months and was confined to a sect whose dominant strength, corn, was contaminated with aflatoxin. Initial analysis proved that the use of Aflatoxin Flavus caused this. Another outbreak of Aflatoxin that affected both humans and dogs was reported in northwestern India. Most of the incidents reported from rural areas of eastern Kenya in the year 2 were caused by the consumption of mold contaminated domestic maize. In year 3, countries in Europe, including Romania, Serbia and Croatia, reported cases of Aflatoxin contamination at national level (Kumar et al., 2017).

When contaminated or polluted foodstuff is sorted out, Aflatoxins cross the threshold to the general food storages where they have been set up in both animal and human food, as well as in feed stores that are for farm animals. Animals nourish contaminated food and that can spread Aflatoxin products into other products such as meat, (dry and fresh ones) eggs, milk, etc. (Awasthi et al., 2012; Fratamico, Bhunia & Smith, 2008). For example, the contaminated poultry feed is suspected in samples of high percentages of aflatoxin-contaminated chicken meat and eggs in the Indian subcontinent (Iqbal et al., 2014).

Scientists have proved that dried fruits Aflatoxin causes cancer in human and fungi should be reminded as dangerous toxins. Familiarity with types of fungus is very essential for all Afghans. Aflatoxin fungi is supposed to have the potential of grow in fresh and dried fruits and vegetables (such as grapes, pomegranates, walnuts, pistachios, peanuts, corn, soybeans, wheat, etc.), that are easily grown and served in most part of Afghanistan. If the Aflatoxin produces these toxins and cause diseases to humans or animals, then no living creature is safe from this poison.

However, for poor countries like Afghanistan people eat food only not to die or survive. Nutritionists at the Afghan National Agency for Food Safety and Nutrition say that each person normally needs to consume between 2,100 and 2,800 kcal per day, while a person needs less than 1,600 kcal per day. Slow consumption leads to chronic malnutrition, which has a detrimental effect on the education, health, mental and physical ability of individuals in society. A uniform diet does not solve the problem of malnutrition, because the body has its own needs in each season, which are not met in one season, and we must always pay attention to the basic needs of the body by consuming a variety of food.

7. CONCLUSION

To conclude, the statements over the six questions brought us to the point to understand what Aflatoxin is. Its harms to human health were discussed in great details under each question. To be aware of and determine Aflatoxin was

another important question that this article concisely talked about it. The main research question "do Afghanistan's fresh and dry fruits easily get contaminated with Aflatoxin?" highlighted the facts that not pointed out in any other papers to date. The levels and the extent to which shows how Aflatoxin is harmful for humans and animal has been discussed point-by-point. The best ways to avoid contaminated food was another research question that this article talked about it.

Currently, Afghanistan has only a handful of foodstuffs (typical Afghan fruits that are suitable for drying such as grapes, apricots, figs, plums, cherries, dry melons, etc.) and it has set up several thousand storages to store such food and farmers' crops which is not enough. To prevent food waste, especially Aflatoxin in dried and fresh fruits as well as other eatable items, the article suggests that in addition to increasing the number of storages, other sorts of food storing should be set up to process, store and export Afghanistan crops i.e., mostly dry fruits such as nuts are pistachios, almonds and walnuts to abroad and fresh fruit and other food products that are mentioned in this article and are easily contaminated by the Aflatoxin.

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