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Quality of products for institutional food markets : Aflatoxin contamination risk management

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This document of capitalization is based on existing documentation and on the elements discussed during the *workshop for the training of grain actors on the aflatoxin management, organized in the framework of the project for the design and implementation of a campaign addressed to producers and agri-food processors in the framework of the project for the creation of the Regional Reserve of Food Security (RFSR) in West Africa (ECOWAS)*

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Its content may in no case be considered as reflecting the position of the financial contributors; to know the European Union, the French Development Agency, the Spanish Cooperation and ECOWAS.

Key messages

- ❖ Aflatoxins are toxic substances produced by fungi, such as mold. They are present in the countries of tropical and subtropical regions, where climatic conditions (including high temperature and high humidity) facilitate their development and proliferation.
- ❖ Aflatoxins contaminate several agricultural products, including grains (corn, sorghum, millet), oilseeds (peanuts), spices, walnuts and also the milk. This contamination occurs either during production or even during the handling and storage after the crops.
- ❖ The consequences of the agricultural products' aflatoxin contamination are multidimensional. They relate both to agriculture and food security, to health (human and animal), and trade, with a particular focus on the access of producers to remunerative markets such as institutional markets.
- ❖ Due to the toxic nature of aflatoxins, when the products are contaminated, they imply significant health risks for consumers and therefore become unfit for consumption, by humans as well as by animals; which affects the availability of food products for populations and, thus in turn, the food security.
- ❖ Aflatoxins are proven carcinogenic substances for humans. They can be the cause of many cases of cancer, malnutrition and stunted growth among children. Apart from the consumption of contaminated cultures by humans, aflatoxins can also enter the food chain through products of animal origin.
- ❖ The prevalence rates observed in the African countries suggest that the contamination of the food products requested in the institutional markets are generally higher than the standards set by the buyers, consequently causing releases of products, followed by destruction of stocks, breach of contracts and huge shortfalls for producers.
- ❖ In addition to the climatic conditions, the bad practices such as the use of seeds of poor quality, late harvesting, delayed drying and handling operations (transportation and storage) of products in inappropriate conditions are factors that exacerbate aflatoxin contamination of agricultural products in Africa.
- ❖ The present document of capitalization highlights good practices as well as the main provisions to be taken by first-line actors (producers, producer organizations, processors, traders, carriers etc.), aiming a better aflatoxin contamination risks management of agricultural products. It also formulates recommendations and proposes potential avenues of action for development actors in the fight against aflatoxins.

Quiz summary: What should you remember about aflatoxins?

No	Fifteen (15) assertions confirmed or overturned	True	False
01	Aflatoxins are dangerous toxic substances produced by fungi.	X	
02	Aflatoxin contamination of products may occur either in the field, during transport and during storage.	X	
03	Insufficiently dried grain storage can result in the production of aflatoxin.	X	
04	Aflatoxin contaminated products' consumption can make you seriously ill or even kill you.	X	
05	Aflatoxins cause cases of malnutrition and stunted growth among children.	X	
06	Contaminated food for animals kills the hens and decreases livestock productivity and profitability.	X	
07	Aflatoxin contamination of the products has negative consequences on food security and agriculture.	X	
08	Aflatoxins prevent producers from having access to remunerative markets.	X	
09	Products with rates of aflatoxins higher than the authorized levels are destroyed or sold on low value markets.	X	
10	We can reduce agricultural products aflatoxin contamination risks by adopting good farming practices.	X	
11	The research actors have developed effective means of biological control against aflatoxins called Aflasafe.	X	
12	The cooking/preparation of contaminated products allows to destroy the aflatoxins by the heat.		X
13	You can confirm the presence of aflatoxins in a product simply looking at it.		X
14	The aflatoxin contaminated products can be used to feed the animals.		X
15	Producers alone can effectively fight against aflatoxin contamination of agricultural products.		X

1. Introduction

Since 2016, thanks to a funding of 56 million Euros from the European Union (EU), the Economic Community of West African States (ECOWAS) launched the West African Food Security Storage Support Project (ECOWAS Stock Project). The aforementioned project is organized into five components which first component is focused on the support to the establishment of the Regional Food Security Reserve (RFSR).

The operationalization of the RFSR is ensured by the Technical Management Unit of the reserve housed within the Regional Agency for Agriculture and Food (RAAF) of ECOWAS. The RFSR brings together a financial reserve (2/3 of the overall reserve) and a physical stock (1/3 of the overall reserve). If the supply terms and conditions of the financial

reserve appear to be more strategic and structural, those linked with the Constitution of physical stocks reveal themselves rather operational. Indeed, calls for tenders have been identified as one of the main channels for the constitution of physical stocks, and ECOWAS has clearly shown its willingness to refuel firstly from West African cereals producers and processors so to better structure the demand for cereals and to improve the producers' income.

In order to stimulate more producers organizations (PO) of the region, and to support their participation in the tendering for the supply of the RFSR, an information campaign has been initiated by ECOWAS through the RAAF and is being led by the consortium "Oxfam - Green Africa International - Jade Productions - Inter-réseaux Rural Development" since July 2017. This campaign has the objective to inform, advise and train the organizations of producers and processors of the ECOWAS countries on the modalities of supply and reconstitution of the RFSR. Among the activities of this campaign, we note a series of workshops aiming to strengthen the capacities of actors, among others, on institutional markets knowledge, on the conditions of access to those markets and key questions thereto, including the control and management of the quality of the products, administrative and accountant requirements, etc.

Moreover, two training sessions have been organized from March, the 7th to the 13th of 2019 in Kara and Atakpamé (Togo) for the benefit of grain actors of Togo and Benin and have focused on the management and control of aflatoxins in the field and during post-harvest operations. If these workshops have been opportunities for exchange and share experiences and knowledge between the various participants, they have also led to better document the question of aflatoxins management in general and, more specifically, in the context of control of the quality of food products for institutional markets. The present

About the RFSR

« The Regional Food Security Reserve (RFSR) was created on February, the 28th of 2013 at the 42nd Summit of Heads of State and Government of the member countries of the Economic Community of West African States (ECOWAS). Third line of defence after the proximity stocks at the villages and communities' level (1st line of defence) and national stocks of food security held by the States (2nd line of defence), the RFSR was invested with the mission of food crisis prevention and management in the region. In addition to complementing the efforts of member states by providing rapid and diversified food and nutrition assistance, the objectives of the RFSR are to express regional solidarity with member states and affected populations through transparent, fair and predictable mechanisms; and to contribute to the food sovereignty and to the political, economic and trade integration of West Africa. »

Source : Report on the Capitalization of the UNPCB's experience in institutional markets

document of capitalization highlights the different lessons learned from these workshops and share them with all the actors involved in institutional markets, and more precisely with the OP. It complements the video entitled "[Aflatoxins : Corn's Scabies](#)" also recorded in the same campaign framework.

2. General information and knowledge on aflatoxins

2.1. Aflatoxins : What are we talking about?

Aflatoxins are mycotoxins, i.e. toxins (or toxic substances) developed by various species of microscopic fungi such as mold. The most common are those produced by *Aspergillus flavus* (residing in the soil) and *Aspergillus parasiticus* fungi. They are mainly found in the tropical and subtropical regions (which cover the whole of Africa), where the climatic conditions, including high temperature and high humidity, promote their development and proliferation. African countries in general, and those of the South of the Sahara in particular, constitute one of the main areas of aflatoxins prevalence with a very high contamination rate.

Aflatoxins contaminate several agricultural products, particularly cereals (corn, rice, sorghum, millet), oilseeds (peanuts), spices, nuts, milk, etc. Aflatoxin contamination of foodstuffs occurs either during the production (in the farms) or during inadequate handling and storage after the crops. It is indeed the combination of climatic conditions and bad practices which facilitates this aflatoxin contamination of agricultural products. More specifically, it can be due to the elevation of the temperature or to dry weather during the maturity of cultures, to high humidity during the crops, and/or to inappropriate conditions of products drying and storage.

More than a problem of public health, the contamination of food products of current consumption by aflatoxins is a development problem because it has enormous negative consequences on both humans and animals health, as well as on agriculture, food security and trade. Aflatoxins are associated with several serious diseases in humans as well as in animals. They also limit the access of producers to remunerative markets such as institutional markets, causing significant shortfall to the producers; affecting in turn the economy of agricultural households.

2.2. How to detect aflatoxin presence in the products?

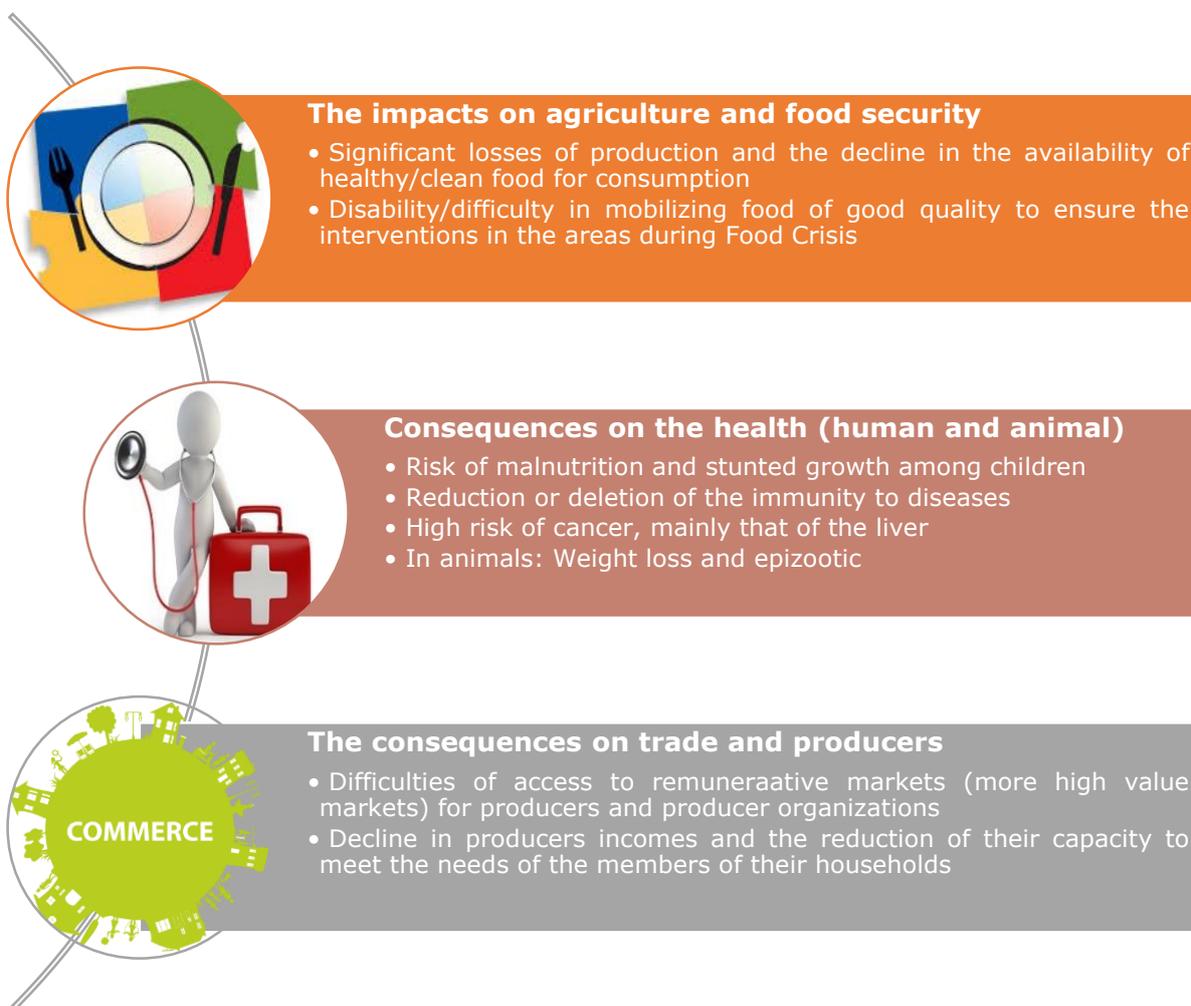
Mold's presence on the products may be considered as one of the warning elements to recognize a product attacked by aflatoxins. These molds are of greenish colour, red or black. But this presence of green champion blur (mold) alone is not enough to confirm the aflatoxin contamination of the product. Similarly, a product apparently clean is not potentially spared from the possible internal presence of the toxin. In other words, all moldy beans are not necessarily infected by aflatoxins, but the risk of contamination would be higher on the spoiled and moldy seeds than on those with little or no mold. Only a chemical test could allow to conclude the presence or not of the aflatoxin in a product or stock. As well, the detection of the presence of aflatoxin in a product can only be confirmed after the achievement of specific biochemical analyzes to be made in the laboratory. These analyzes allow not only to characterize the type of aflatoxin responsible for the contamination, but also the rate or level of contamination of the product.

Furthermore, it is important to note that there are detection kits which allow to achieve rapid tests from the samples in order to identify the presence or not of aflatoxins in the

stocks on the ground. These kits, whose costs are generally very expensive, are available to certain institutions or structures which buy important stocks of agricultural products for different purposes. This is the case for instance of the World Food Program, which during food purchases for interventions in the areas in food crisis, use these kits for the detection of aflatoxins to ensure the quality of the purchased products.

2.3. Consequences of foodstuffs aflatoxin contamination

The consequences of aflatoxin contamination on agricultural products are multidimensional. They relate both to agriculture and food security, to health (human and animal), and trade with a particular focus on the access of producers to remunerative markets such as institutional markets.



➤ Consequences on agriculture and food security

Aflatoxins have a considerable effect on the agriculture and by ricochet on food security. Indeed, due to the toxic nature of aflatoxins, when agricultural products are contaminated, they represent significant health risks for the consumer. These products are therefore becoming unfit for consumption for humans as well as for animals and represent losses to be deducted from the total agricultural productions. This deduction of contaminated products (therefore lost) led to a decline in the availability of foodstuffs; which also affects the spatio-temporal accessibility and financial viability of populations to food. This is why food security is affected by the aflatoxin contamination of the products.

At the same time, these losses of agricultural productions causing the decline in the availability of healthy/clean food consumption, also affect the ability of mobilization and collection of food for responding to crisis situations in the affected areas. In a context where more and more pockets of food insecurity are observed, this aflatoxin

contamination of agricultural products then appears as a very limiting factor for interventions as well of States through the structures to support food security, as for international and humanitarian organizations specialized on these issues.

➤ **Consequences on human health and on animals**

The implications for health constitute key elements concerning the consequences of aflatoxin contamination of agricultural products. Indeed, the consumption of products contaminated by aflatoxins is very dangerous because these products are harmful to human health as well as to that of the animals.

- **Among humans:** The consumption of aflatoxins contaminated products by humans exposes them to a risk of poisoning called aflatoxicosis . Aflatoxins are proven carcinogenic substances for humans. They would be the cause of many cases of cancer, including that of the liver in particular. Regular consumption of products contaminated by the aflatoxin B1 damages the liver and can lead to cases of cirrhosis. Several studies (such as Cardwell¹ in 2000 for instance) have also proved that the intoxication

by aflatoxins could aggravate malnutrition, delay the growth among children, and reduce immunity to diseases.

- **Among animals:** The consumption by animals of aliments contaminated with aflatoxins would cause a decrease in the productivity and the profitability of livestock. More specifically, among animals, links may exist between the consumption of contaminated food and situations of weight loss, and epizootic.

It should be noted that, apart from the consumption of contaminated cultures by humans, aflatoxins can also enter the food chain through the products of animal origin.

Consequences on food security

"If we consider that we should have a certain amount of production to feed the population of a country and aflatoxin contamination of the production occurs, it means that this will affect the population. We won't have the quantity needed to feed the population".

Source : Declared by Mr Sandou Gnassingbé, CTOP President

Case of aflatoxicosis in Kenya

The earliest reported case of aflatoxicosis in Kenya was in 1978; other outbreaks occurred in 1981, 2001, 2004, 2005, 2006, 2007 and 2008, resulting in sickness, death and destruction of contaminated maize. The largest outbreak which is of 317 cases including 125 deaths, was held in Kenya from January to June 2004. The analyzes have revealed that corn seeds from households of case had higher concentrations of aflatoxin that households controlled. Maize from the affected areas contained as much as 4400 ppb aflatoxin B1, which is 440 times greater than the 10 ppb tolerance level set by the Kenya Bureau of Standards.

Source: Aflatoxin: a synthesis of the research in health, agriculture and trade (USAID 2012)

¹ KF Cardwell, 2000: Mycotoxin contamination of foods in Africa: Antinutritional factors. Food and Nutrition Bulletin, No. 21, p. 488-493.

The aflatoxin M1 for instance, is excreted in the milk from animals having received food contaminated by the aflatoxin B1. This implies that, if the livestock are fed with contaminated products and if humans consume in turn these animals or products derived from them, there is a risk of exposure to aflatoxins and therefore to the aflatoxicosis . It appears then that the transformation of the aflatoxins contaminated livestock food products is not a solution that protects human beings from being exposed to this poison.

➤ **Consequences on trade and on agricultural households' economy**

In the strategies aiming the promotion and the development of the agricultural sector, the importance of the facilitation of access to remunerative markets to the producers is no longer to demonstrate. In effect, these markets allow producers to have better profit margins for the investments (both in terms of physical effort and of capital) injected into the agricultural activities by the main actors. Among the so-called remunerative markets, we find the institutional markets whose positive effects on the structuring of the demand for agricultural products and the improvement of incomes of the products are more and more known.

If the institutional markets are recognized as markets with high added value, one of the major conditions for access them relies on the good (even excellent) quality of the products. Indeed, issues related to health security (food) have long fuelled debates around products quality, and have led to the definition of the product standards. Specifically concerning aflatoxins, regulations relate primarily to the definition of seuils de tolerance thresholds for the contamination of the products. In other words, to limit the exposure of consumers to aflatoxins, many countries define in their foodstuffs trade regulations, the limits (threshold) beyond which the products cannot be accepted and/or marketed. These thresholds vary from one region (or country²) to another and also take account of the uses to be made of products; the more severe limits being defined for the products intended for human consumption. There is also the rate of maximum contamination set by the institutional buyers such as the humanitarian agencies, or the private sector actors, such as breweries.

The prevalence rates observed in many African countries suggest that aflatoxin contamination of food products requested in the institutional markets such as corn, rice, sorghum, etc., are generally higher than the standards (limits) laid down by the buyers. The consequences of this are, among others, releases of products (by the buyers) followed by destruction of stocks, contracts breaching and huge shortfalls for the producers. These losses greatly affect the economy of the agricultural households and are manifested by the decline of producers' incomes and the reduction of their capacity to meet the needs of their households' members. It is clear then that the aflatoxin contamination of agricultural products of current

Contract loss by the CPC Togo

"In 2015, the grain producers central of Togo (CPC) has lost an institutional contract with the company Premium Foods which is a Ghanaian company of Agri-Food which produces enriched flour. It is the presence of aflatoxin at a rate abnormally high in the product that we have delivered, who has been the reason of this contract loss. And when evaluating the loss, it has been evaluated in about 2.851.000.000 FCFA. "

Source: Declared by Mr Salif Olu Adara CTOP SG

² The aflatoxin contamination rate of the products is expressed *in parts per billion (ppb)*. It is limited to 4 ppb according to European regulations and to 20 ppb in the WHO and U.S. regulations (U.S. Department of Agriculture - USDA).

consumption truly limit the participation of producers and their organizations in the institutional markets.

3. Prevent and limit aflatoxin contamination: What to do?

In addition to the climatic conditions, the bad practices such as the use of seed of poor quality, the late harvesting, delayed drying and handling operations (transportation and storage) of products in inappropriate conditions, are the factors that exacerbate the aflatoxin contamination of agricultural products in Africa. In the light of the major consequences that flow from this contamination, it is important to ask questions with respect to the (good) practices to adopt as well as the provisions that should be taken by the different stakeholders (producers, carriers, stockers/traders etc.) to prevent and/or reduce the risk of foodstuffs' aflatoxin contamination.

3.1. Precautions to be taken during field production

The precautions to be taken in order to avoid or prevent aflatoxin contamination during the production in the field go from preparation activities (upstream of the production) to the activities during crops.

- **Preparation (pre-production):** From the very beginning, it is important to ensure that the seeds that will be used are of very good quality.
 - **Choose good quality seeds :** the choice of good quality seed is essential, on one hand, to prevent the contamination likely to be originated by the contaminated seeds and, on the other hand, to guarantee the quality of the crops. At this level, the use of certified seed is strongly recommended.
 - **Clean the seeds before using them:** This cleaning is done upstream by sorting the seeds. The apparently not reached seeds that will be used will be separated from those that present deformations, stains or molds, etc., and which will be destroyed.
- **During the actual production**
 - **Use inputs of good quality:** The use of specific fertilizers of good quality helps to limit the risk of development of fungi and therefore of aflatoxin contamination. It is also important to prevent cultures to be attacked by insects promoting their use on the good dates (including following the cropping calendars and the technical itineraries) products treatments adapted and of good quality.
 - **Follow the development of cultures:** This also allows reducing the risk of contamination. During the germination phase, for instance, the regular monitoring of the stages of cultures development will identify the seeds that have not germinated and replace them in order to prevent fungi from developing there to contaminate the other plants.
 - **Regularly maintain the field and its surroundings:** In order to reduce the proliferation of weeds and the attacks of the rodents during production, it is important to maintain the field and its surroundings clean.
- **For cropping operations**
 - **Harvest the products as soon as they are mature enough:** The operations of crops must done on the very good dates. In other words, it is important to avoid leaving the products staying too long in the fields under the pretext of wanting to obtain the grain very well dried up by the sun. The delays in crops

expose the products in the fields to the weather, including dry winds and dust that could facilitate the contamination by aflatoxins.

- **Systematically sort the crops:** After the harvest, the ears likely to be contaminated (including malformed or blackened ears, as well as those attacked by the caterpillars etc.) should be separated; this sort should be done systematically after the harvest and, for this, clean tarpaulins on which to put the products must be provided. It is indeed important that the products harvested are not left directly on the ground since this is where the fungus *Aspergillus flavus* that produces the aflatoxins (group b).
- **Destroy (potentially) contaminated ears:** After sorting, it is important to destroy the risky spurs. For this, it is necessary to make a hole and to burn the ears in it. This allows to significantly reduce the risk of presence or proliferation of fungus in the operating system.

In addition to the aforementioned practical measures, which, when implemented, help reduce the risk of development of fungi and aflatoxin contamination of cultures during production, it should be noted that

there are also biological means to control and combat the aflatoxins. Among these means, Aflasafe occupies a place of honour. Aflasafe has been developed by the International Institute of Tropical Agriculture (IITA) and its partners. It is a product of biological control containing non toxic local strains of *Aspergillus flavus* that replace those that produce toxins when they are applied in the fields. One of the advantages of the Aflasafe lies in



Kind of Aflasafe packages
Source: IITA and USDA (2018)

the fact that the protection against aflatoxin contamination continues after the harvest and is optimized by an appropriate drying and storage. The packaging of 2,5kg and 5kg in which are conditioned Aflasafe allow this product to be easily handled and used by producers.

3.2. Products' storage: How to avoid aflatoxin contamination?

The poor conditions of storage facilities as well as the inappropriate practices are also mentioned as important elements that increase the risk of aflatoxin contamination of agricultural products. The measures to be taken to avoid the aflatoxin contamination during storage are valid both for the direct storage of products with the ears, as well as for their storage after ginning. It just have to be made sure that ginning is done in appropriate conditions with adapted equipment allowing to have, in the long term, intact and clean grain to be stored.

➤ Concerning the storage infrastructure:

- **Ensure that the stores adhere to the standards of storage:** The standards in terms of aeration are paramount in order to reduce the risk of contamination during storage. It is recommended that the stores have provisions for encouraging a humidity rate between 55% and 65% in order to ensure the quality of the products that will be stored.

- **Ensure the stores' cleanliness:** It is important that the inside and surrounding area of the store are properly and regularly cleaned. It is also advisable to ensure to fend off the attacks of rodents and insects. To do so, the traps against rodents (rats, mice, etc.) can be placed all around the store, as well as insecticides.
- **Concerning the storage practices:**
 - **Make sure that the products are well dry before storage:** The humidity is one of the main conditions favouring the development of mold. It is important thus to ensure that the products are the less wet possible before being stored. The rate of humidity must be under 13%. At this level, it is recommended to use the moisture meter to check this rate. In the absence of moisture meters, one of the most effective endogenous technologies is that of the bottle and salt technique control.

Grain moisture control by the bottle and salt technique

"The technique consists in putting in a clean and dry empty bottle, some well dried salt. You add then some grains (corn for instance) and you then shake the bottle. After shaking the bottle, the salt sticks against the inner wall of the bottle, this implies that the grains are still wet. If the salt does not stick, this indicates that the grains are dry enough and can be stored. "

Source : By Mr Julien AKOUEHOU, PMCB President
 - **Avoid that the bags containing the products being in direct contact either with the ground or with the walls of the store:** In absence of barrels, drums or silos to keep the products, we could use the bags well sewn and well closed, while taking care to make sure that these bags containing the products do not suffer from the moisture. It is then advisable to leave planks or pallets laid on the surface of the ground, on which prepare the bags. The bags used to store the products must be well sewn. Alleys and corridors of aeration are to be left in the store where products are stored in order to be able to move around easily.
 - **Regularly monitor the stock in the store:** It is recommended that the store is visited periodically to identify potential risks of contamination. The ideal would be store being near the dwellings of its owner. This facilitates the tracking of the stock according to the different actors, in this case producers and traders.
 - **In case of grouped sales, establish systems of control and traceability of the products of each member:** In case of sales grouped, it is important to put in place mechanisms for control and traceability of the products of each one of the members. This would prevent contaminated products of a member to contaminate the entire stock collected from other members.

3.3. Risks management of aflatoxin contamination during transport

The different actors, including producers, carriers and merchants all agree on the fact that the risk of contamination of products by aflatoxins during transportation of the goods are more than proven. The findings that emerged from the experiences of different actors, it will be noted that the main initiatives to be taken to reduce or even eliminate the different risks of contamination during transport are related to vehicles as well as to organizational aspects of the transport.

➤ **About vehicles**

- **Make sure that the vehicle is in very good conditions:** It is recommended to make sure that the vehicles used for transporting the products are in very good conditions at the mechanical level. Selected vehicles disinfection operations are strongly recommended in order to eliminate the various pathogens that could be on the vehicle and be likely to contaminate the products.
- **Take measures for securing products and preserving their quality:** It is that the tarpaulins used to fully cover the products are disinfected and in very good conditions. This allows preserving the quality of the products by protecting them from bad weather during the transport.

➤ **Concerning the organizational aspects of the transport:**

- **Establish transport contracts:** Through these contracts, the obligations of each party involved are defined; which allows accountability in case of incidents. The establishment of contracts appeal to the sense of professionalism of the different actors involved in the activity.
- **Take the relevant measures in terms of handling:** This implies to ensure the good packaging of the products, i.e. appropriate and resistant packaging for transport. Packing should also be done in an orderly manner, that is to say well storing or settling the bags in the truck.
- **Anticipate on the road harassment:** Have all the documents necessary for the transport of the products in order to avoid or reduce the road harassment likely to stop the conveying of products; which would expose the products to the weather and thus increase the risk of contamination. Bags should also be well labelled and marked in order to facilitate the security forces' controls.

4. Conclusion, recommendations and avenues of actions

The impact on health (human and animal), food security as well as on the economy resulting from the aflatoxin contamination of agricultural products speak to all first-line actors involved in development issues. Because of the aforementioned consequences that they have in the different sectors/areas, aflatoxins represent a real challenge to development initiatives.

This document has highlighted the good practices, as well as the main measures to be taken by the first-line actors (producers, producers organizations, processors, traders, carriers etc.) with a view to a better management of the risks of aflatoxin contamination of agricultural products. Thus, the main recommendation to make to these actors is the effective implementation of these advices. However, the fight against aflatoxins is not the sole responsibility of producers, carriers and traders and their organizations. Other actors at different levels also have important roles to play. This is the case for example of States, regional organizations, organizations to support the development, etc... Regarding the latter, the following elements are presented as the avenues of actions on which they could engage in order to effectively contribute to the fight against aflatoxins. These include :

- **Accompany the first-line actors in the knowledge of the aflatoxins, as well as in the adoption and dissemination of good practices in the fight against aflatoxin contamination.**

- Production and dissemination of benchmarks and knowledge products (information and awareness boards, technical data sheets, etc.) on good practices and the specific provisions of fight against aflatoxins;
 - Organization of sessions of capacity building (training, implementation debates, exchange visits, etc.) addressed to first-line actors on the issue of aflatoxins and means of fight against contamination;
 - Organization of the mass communication initiatives (radio and television broadcasts, documentaries, etc.) around aflatoxin issues.
- **Accompany the risk reduction of aflatoxin contamination of the products throughout markets supply chains:**
- Facilitating the access of producers to inputs (seeds, fertilizers, products of treatment and maintenance, etc.) of good quality and time;
 - Improvement of the access of producers to coaching services and agricultural Council;
 - Staffing of the groups in storage infrastructures respecting the standards;
 - Relief of procedures in the matter in transport (including cross-border), with a view to reducing the situations of capital assets of vehicles for conveying of food products sensitive to contamination by aflatoxins.
- **Contribute to the development of the means of biological control and their dissemination to producers**
- At the disposal of the actors of the world of research, the technical and financial means for the development of solutions for biological control;
 - Implementation and process facilitation country and regional around the development and dissemination of the means to fight biological to the like of Aflasafe;
 - Promotion of dialogs and initiatives between the different stakeholders (producers, actors of development, researchers, the private sector etc.) for a better management of the aflatoxin.
- **Facilitate the detection of the presence of aflatoxins and the control of stocks and of products**
- Financing of the actors of the research for the development of alternative kits for the detection of aflatoxins at a cost less expensive, and accessible to players;
 - Facilitating the access of producers and their organizations to the equipment of detection (kits) by the grant of the costs of acquisition and/or staffing

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6. Annexes

- To view the Powerpoint files presented during Kara and Atakpamé training workshops about the management of aflatoxins, click [HERE](#)
- To find out more about the Kara and Atakpamé training courses on Aflatoxin management, click [HERE](#) and restitution in Benin, click [HERE](#)
- To view the video titled "Aflatoxins : Corn's Scabies"; click [HERE](#)
- To view the Report on the Capitalization of the UNPCB's experience in institutional markets, click [HERE](#)
- To view the Bulletin summary (BDS N°26) on food institutional markets, click [HERE](#)