

Ultimate Technology to Reduce the Aflatoxin Level in Maize

Charles Wanjau

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Aflatoxin Exposure in Africa.

- Aflatoxin is a mycotoxin mainly found in maize
- Aflatoxin in maize can occur on the field and during storage, in particular in humid environments
- FAO of the United Nations estimates that approx. 25 percent of the world food crop is affected by mycotoxins
- Aflatoxins are toxic and among the most carcinogenic (causing cancer) substances
- Children below five years remain most vulnerable



Goal of Maize Milling.

To produce:

- Clean and safe finished products
- Meet today's increasing stringent food legislation requirements
- Products which fulfill consumer demands

How to achieve the goal:

- With the latest technology through the value chain, from grain to flour
- Infested kernels must be rigorously separated.
- Proper degermination and selective grinding



Raw material – Maize.

- Raw material, especially maize, arrive at the mill often contaminated by fungi and diseases
- Fungi levels especially, in particular Aflatoxin, exceed the food legislation requirements such raw material is rejected
- If Aflatoxin contamination levels remain within the food legislation, millers are still obligated to take all measures for achieving top quality products with least contamination



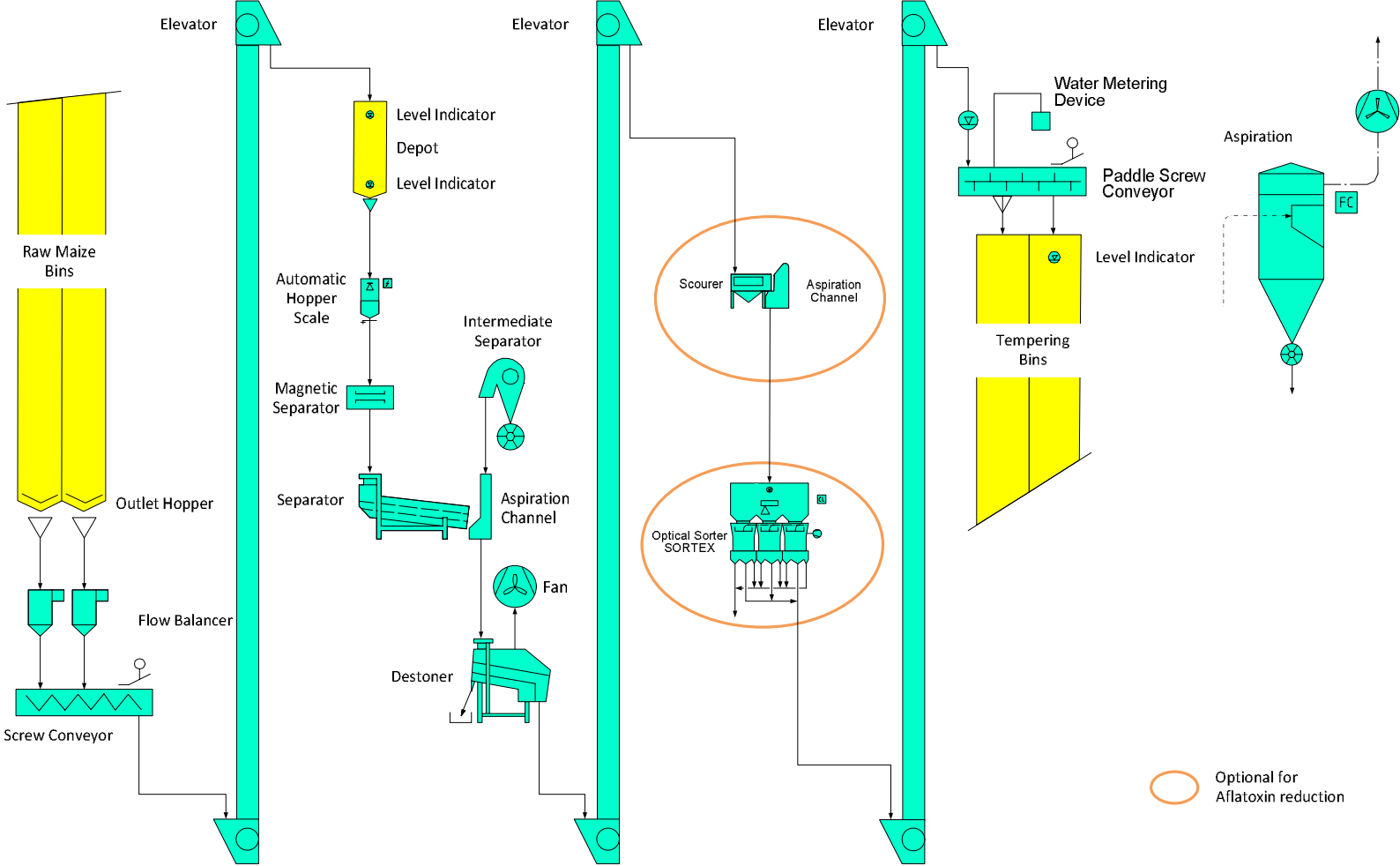
Maize Cleaning.

Separator with Aspiration Channel

- Removal of coarse particles. This includes maize cobs which may be contaminated
- Removal of sand, weeds, fine particles, including broken grains which may be contaminated
- Removal of dust and light impurities



Maize Cleaning and Conditioning Section. Flowsheet.



Maize Cleaning to minimize Aflatoxin contamination.

- Infested grain must be rigorously separated. This is done in combination with sieving, aspiration as well as optical sorters Sortex.
- Sound kernels are often contaminated on the surface by the damaged and diseased grains. Intensive surface cleaning followed by an aspiration is a prerequisite.



Maize Cleaning.



Scourer
For surface cleaning of the grain.
This reduces the dust attached on sound grains



Aspiration Channel
For removal of dust and fine light particles



Conidur Scouring Jacket
For intensive cleaning

Maize Cleaning.

Optical Sorter

For removal of:

- Diseased/discolored kernels
- Cobs
- Broken grains

There are two ways of sorting:

- *Monochromatic sorting
(Used in the grain milling Industry)*
- *Bi-chromatic sorting*



For detection of Aflatoxins, bichromatic sorting is used

Optical Sorting.

Accepted Product

Rejected Product



Clean Maize



Cobs

Foreign material



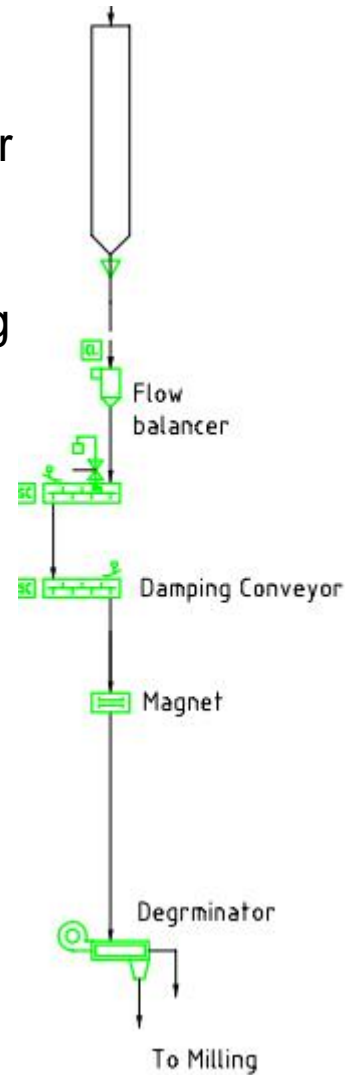
Discolored Grain



Rotten & diseased Maize

Maize Degermination.

- Adding correct amount of water
- Uniform distribution and conditioning time in dampening conveyor
- Best separation of germ and bran from endosperm



Maize Milling.

After carefully and thoroughly cleaning the maize, the maize is ready for milling after conditioning.

Aim of the Maize Milling is:

- To gradually reduce particle size of the maize from degerminator
- To recover good flour from throughs of the degermination
- To remove as much as possible of the remaining bran and germ still attached to the endosperm

Maize Milling end products:

- Endospem
- Germ (Germ meal)
- Bran (By-product)



Maize Milling.

Main finished products.

Flake grits

5'600 – 4'000 μm

Fat 0.6 – 0.8%



Snack grits

< 800 μm

Fat 1.0 - 1.2%



Brewer's grits

1'200 – 300 μm

Fat < 1.0 %



Maizemeal

< 670 μm

Fat 1.0 – 2.0%



Ultimate Technology to Reduce the Aflatoxin Level in Maize. Summary of key factors.

- Precise cleaning of raw maize with sieving, aspiration as well as optical sorters Sortex
- Intensive surface cleaning followed by an aspiration
- Optimal conditioning of maize
- Best degermination, grinding and sifting



Conclusion:

- To meet top quality and food safety requirements, latest technology and equipment must be applied.



One step ahead.

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