AFLATOXINS, AWARENESS CREATION AND TRAINING IN GHANA

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AF INCIDENCE IN GHANA

Groundnut samples in Accra – 69% highly contaminated (Beardwood 1964)
AF INCIDENCE IN GHANA (CONT’D)

- Damaged kernels
  - Ave: 3,276 µg/kg
  - Range: (5.7-22,166)

- Undamaged kernels
  - Ave: 12.1 µg/kg
  - Range: (ND =154.2)

Source: Awuah and Kpodo (1996)
AF INCIDENCE IN GHANA (Cont’d)

- Maize samples in Ghana – 80% with AF > 30μg/kg AF (Kpodo and Halm, 1990)

- 31 of 32 fermented dough samples – up to 310μg/kg AF (Kpodo et al., 1996)

- 15 of 16 Ga Kenkey samples – up to 200μg/kg AF (Kpodo et al., 1996)
AF INCIDENCE IN GHANA (Cont’d)

• AFB$_1$ measured in 140 blood samples
  High AFB$_1$ – 0.12 - 3 pmol/mg
  (Median – 0.80 pmol/mg)

• AFM$_1$ measured in 91 urine samples
  ND – 11,562.36 pg/mg
  (Median – 472.7 pg/mg)

(Jolly et al., 2006)
SENSATIONAL REPORTS ON AF IN GHANA

**The Chronicle**

**SHOCK SCIENTIFIC REPORT:**

KENKEY CAUSES CANCER

... how to minimise it

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By: Kojo Coonsorn

Scientific studies conducted from major processing sites and markets in Accra have concluded comprehensively that there is a widespread occurrence of the strain that causes cancer, particularly liver cancer, in Kenkey.

The scientific community which conducted the research, Food Research Institute (alongside foreign scientists), have so far limited the circulation of the report, which is written in a confidential manner so that only selected members of the administration have access to it.

According to the report, the maize which is a major driver of the disease, is not dried within the two to three days of harvesting, thus making it prone to contamination.
“Scientific studies from major proceeding sites and markets in Accra have concluded comprehensively that there is a widespread occurrence of the strain that causes cancer, particularly liver cancer, in Ga Kenkey.”

Kofi Koomson, Ghanaian Chronicle Vol. 6, No.133
August 17- August 18, 1998
SENSATIONAL REPORTS (CONT’D)

The Kenkey palava

By Vic Odal

Corn, a crop high in carbohydrates, is a staple in one of the most widely grown cereals in the country. It plays a major role in the daily diet of most people.

Freshly caught, either boiled or stewed, it is a delicacy enjoyed by many. However, the high demand for kenkey, boiled, starchy food and sushi has caused a shortage.

But perhaps the most popular of all these foods is the kenkey ball. It is popularly known as the "ball" of the world. A variety of kenkey balls can be found in different parts of the country.

Although it is a delicacy, some people believe that kenkey balls could be a substitute for other foods, especially for those who do not have access to other nutritious foods.

Those who have something to do with the administration of justice must consider making the process efficient without suffering or offending some of the citizens, who have been put in these positions. It is hoped that the Judicial Service Association of Ghana will continue to work towards this goal.

This is most unfair, ECG

We read in the news about the recent decision to approve the sale of land to the government. This decision was made without consulting the local community, who are the ones who will be affected.

The important thing is that the government ensures that all communities are involved in the decision-making process. This will help to ensure that the land use plan is fair and that the rights of all citizens are protected.

However, it has been reported that the government has not consulted with the local community before making this decision. This is a clear violation of the law and the rights of the community.

The government should be transparent in its decision-making process and should ensure that all citizens are informed and involved in the decision-making process.
The Kenkey Debate: Must We Tell The People? (1)

I AM SUBMITTING the following documents titled:
"The occurrence of mycotoxins in fermented maize products", and
2. "MYCOTOXINS" for your critical reading.

I would wish to make a few notations which, for your information, informed my decision to publish the story that has generated so much controversy within the last week and continues to generate debate within the media.

The decision to make this statement has been provoked by the handling of the news by government functionaries after The Ghanaian Chronicle of August 17th 1998 banded with the Solicitor: KENKEY CAUSES CANCER I think the timing, speed and even the composition of the pieces at the press conference was excellent, and I compliment the government for that.

But I have some reservations about the right interpretation of the thought processes of the journalist and by extension, the public. Must we tell the public? was the guiding principle of the Ministry of Food and Agriculture.

The government statement on the subject smacked of Christian correctness. Legally, it was correct and accurate. In ministerial language, it was correct. But it was also correct.

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The government statement on the subject smacked of Christian correctness. Legally, it was correct and accurate. In ministerial language, it was correct. But it was also correct.
'What is emerging is a pattern of massaging of the truth by politicians afraid to deal with the whole unpleasant truth even if means creating the necessary panic that should spark the urgent search for a panacea'

*Kofi Koomson. 1998. The Ghanaian Chronicle. 2nd – 3rd September*
SENSATIONAL REPORTS (CONT’D)

THE BATTLE OF THE KENKEYS

SWEET Doria, Please pardon me for not being able to keep up with my bi-weekly obligation towards you. The fault is entirely mine. I refuse to seek refuge in the threathrich clutches of many of my people in striving to meet my obligations towards the upkeep of my family. I must confess that I have been neglecting my duties in this respect. I sincerely hope that you will forgive me for this oversight.

The effort was magical. The Wigu blockaders rampaged. The Union of Ga Kenkey Manufacturers retreated into a secret enclave on McKenzie Street. The news spread rapidly through the streets, and the local newspapers carried reports of the battle.

The battle was intense and lasted for several hours. Both sides fought bravely, with many casualties on both sides. The Wigu blockaders used their superior numbers to their advantage, while the Union of Ga Kenkey Manufacturers fought back with determination and bravery.

The battle ended with a victory for the Wigu blockaders. However, the Union of Ga Kenkey Manufacturers vowed to fight again, and the battle continued for several days. The news spread quickly, and the battle became a topic of discussion in the streets and in the newspapers.
Sensational Reports (Cont’d)

The occurrence of mycotoxins in fermented maize products

Professor M. Jakobsen, a food scientist at the Danish Institute for Food and Agricultural Research in Copenhagen, last week confirmed that the risk of fermented maize products including kenkey is real, but added that it is a transient subject.

He was being interviewed to elaborate on a report he helped produce, beginning in 1991 and stretching over an 18-month period of experiments and trials.

While holding back on releasing more details on grounds that the report was a preliminary to a Ghana Food Research Centre in Ghana, he disclosed that an indirect variant had not been published with emphasis on how the risk can be minimized or avoided.

The Chronicle, but obtained that updated report through other sources. It will be revealed that the Ghana Food Research Centre acted on claims made in the country that Kenkey and other fermented maize products are safe to eat.

The report states, "The occurrence of mycotoxins in fermented maize products" reveals that four types of aflatoxin, the R1, 0, 01, and 02 are present, but the 01 and 02 which according to the National Research Council on Nutrition are the dominant. It, are reduced by 60 per cent through proper initial cooking, but are not completely destroyed by cooking.

The Chronicle will publish the full report on Wednesday.
ARE GHANAIANS AWARE OF THE ALATOXIN MENACE?

MYCOGLOBE CONFERENCE

THEME: REDUCING IMPACT OF MYCOTOXINS IN TROPICAL AGRICULTURE

13-16 SEPTEMBER, 2005
AWARENESS OF AF IN GHANA

Knowledge of AF

% of respondents

Peanut farmers
Poultry farmers
Millers
Retailers
Processors
Consumers
**AWARENESS (Cont’d)**

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<th>Issue</th>
<th>Agriculturist</th>
<th>Physician</th>
<th>Nurse</th>
<th>Pharmacist</th>
<th>Biologist</th>
<th>Other</th>
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Issue: 1- Awareness of the mycotoxin; 2- Awareness of term aflatoxin; 3- Awareness of what produces mycotoxins; 4- Correct indication of what produces mycotoxins; 5- Awareness of effects of aflatoxins on humans; 6- Correct indication of the effects of aflatoxins on animals; 7- Awareness of aflatoxins on humans; 8- Correct indication of the effects of aflatoxins on humans; 9- Awareness of aflatoxin contamination of groundnut; 10- Attended an aflatoxin workshop(s); 11- Formal training on aflatoxins; 12- I sort groundnuts before eating them so that I won’t be sick
AF AWARENESS CREATION SYLLABUS

i. GROUNDNUT PRODUCTION IN GHANA
   ➢ Areas of production
   ➢ Production figures
   ➢ Uses

ii. WHAT ARE AFLATOXINS (AFs)?

iii. HOW GROUNDNUT BECOMES CONTAMINATED WITH AF
   ➢ Pre-harvest contamination
   ➢ Post harvest contamination
IV. FACTORS AFFECTING CONTAMINATION

- Pre-harvest factors
- Post harvest factors

V. MANAGEMENT OF CONTAMINATION

- Pre-harvest interventions
- Post harvest interventions
POST HARVEST INTERVENTIONS

- Inverted windrow drying vs. random windrow
- Proper drying - < 10 % moisture
- Sorting of nuts
POSTHARVEST INTERVENTIONS (Cont’d)

- Storage in interlaced polypropylene and jute bags (wooden platform)

- Avoid market groundnut butter (homemade butter preferable)

- Protection with plant products
MARKET GROUNDNUT IN GHANA
MARKET GROUNDNUT (Cont’d)
MARKET GROUNDNUT (Cont’d)
MARKET GROUNDNUT (Cont’d)
GHANAIAN MEDICINAL/CULINARY PLANTS

MONODERA

SYZIGIUM

PIPER

XYLOPIA
SYZIGIUM TREATED AND UNTREATED GROUNDNUT
TREATED AND UNTREATED NUTS
# FIELD MANAGEMENT OF AF WITH SYZIGIUM

<table>
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<tr>
<th>Treatment</th>
<th>(%) Mouldy kernels</th>
<th>AF at 3 mn (µg/kg)</th>
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<tr>
<td><strong>IPPB</strong></td>
<td></td>
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<tr>
<td>9.0% with <em>Syzygium</em></td>
<td>3.71(8.26)</td>
<td>25.1</td>
</tr>
<tr>
<td>9.0% without <em>Syzygium</em></td>
<td>6.73(20.53)</td>
<td>36.2</td>
</tr>
<tr>
<td>6.0 with <em>Syzygium</em></td>
<td>1.03(4.83)</td>
<td>ND</td>
</tr>
<tr>
<td>6.0% without <em>Syzygium</em></td>
<td>3.24(19.83)</td>
<td>27.5</td>
</tr>
<tr>
<td><strong>PB</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.0% without <em>Syzygium</em></td>
<td>3.39 (100)</td>
<td>29.3</td>
</tr>
<tr>
<td>9.0% without <em>Syzygium</em></td>
<td>45.76 (100)</td>
<td>64.0</td>
</tr>
<tr>
<td>6.0% with <em>Syzygium</em></td>
<td>1.55 (4.96)</td>
<td>1.6</td>
</tr>
<tr>
<td>6.0% without <em>Syzygium</em></td>
<td>24.01(32.63)</td>
<td>84.0</td>
</tr>
<tr>
<td><strong>LSD</strong></td>
<td>0.63 (0.068)</td>
<td></td>
</tr>
<tr>
<td><strong>CV</strong></td>
<td>2.26 (1.08)</td>
<td></td>
</tr>
</tbody>
</table>

Assays were made at 3 and 6 mn. (6 mn values are in parenthesis); IPPB = interlaced polypropylene bag; PB = polythene bag. AF before storage = 0µg/kg.
WORKSHOPS

1ST NATIONAL WORKSHOP ON GROUNDNUT AND GROUNDNUT AFLATOXINS KUMASI: 19TH-21ST SEPTEMBER, 1999
WORKSHOPS (Cont’d)
Lecturer Warns Ghanaians Against Aflatoxins In Food Crops

Dr. Awasu was delivering a paper on "A Review of Afla
toxin Research and Achieve-
ments" at a National Work
shop on Groundnut and
Groundnut Aflatoxins in
Kumasi, recently.

Under the theme: "Sustain-
able Management of the
Groundnut Aflatoxins Measure
in Ghana," the three-day
workshop sought to create
awareness of groundnut afla-
toxins in the country and
convinced national effort
to address the problem.

It was organized through
a collaboration of frontier
institutions initiated in 1991
to maintain and
University in the United
States of America (USA), and
USAID with funding from the
United States Agency for
International Development
(USAID).

Dr. Awasu, who asked Ghanaians to be wary of aflatoxins in
food crops such as ground
nuts, maize, cowpea, soya
beans and sorghum among
others.

He explained that the afla-
toxin contamination was first
detected in 1980 in the United
Kingdom following the cases
of a strange health ill
among animals which was
subsequently linked with
groundnut meal imported
from Brazil.

"Aflatoxins are known as
animal models to impair a
number of biochemical sys-
tems and are potent liver
toxins," he stressed and
expressed the hope that the
Forum would create aware-
ness to farmers and for a col-
lective and concerted national
effort to address the problem.

Dr. K. O. Marfo, Director
of the Savanna Research In-
stute (SRI), said inadequate
seed preparation and untem-
ned seed distribution, delayed
harvest, improper drying and
storage affected the realisa-
tion of the full genetic poten-
tial of the groundnut and that
reduces its market value.

ECG Asked To Improve And Expand Its Services

Dr. Awasu is urging Ghanaians to be wary of aflatoxins in
food crops.

He said for groundnut to
play a greater role in the
Ghanaian economy, it was
necessary for scientists to
develop it to improve the
nutritional content of the
crop.

Dr. Awasu appealed to the
government to stimu-
late the production of
groundnut oil by establishing a
guaranteed market for
groundnut oil.

He said that the
production of groundnut oil
would improve the agricul-
tural economy of Ghana.

Dr. Fadd Waryar, an
Executive Member of the
International Crop Research
Institute for the Semi-Arid
Tropics (ICRISAT), said groundnut oil
was imported to West Af-
rica by the Portuguese dur-
ing the 16th Century and
that had been a source of nutri-
tious food for human be-
ings and livestock.

He cautioned against the
use of aflatoxins in the
crop.
THANK YOU
MERCI