بحث الآلافتوكسين في علاج الدواجن المستخدمة في مزارع انتاج البضخ

معًا: عبد العزيز شعبان، ثابت ميدان، زكريا مختار، عادل شحاته

بعد الآلافتوكسين من أمير السهرة، الإعتياد اليوم، وقدنمنجاد
الصدأة على احدث الدوافع في الأسوار، والحيوان، ولقد بني
كلمنلانسان، والحيوان، منجابة العالم، وأثبتت الايجابات السابقة التي أجريت
بجهوية عمر العربية أن أكثر من 50% من نظر الإستعراض المعروض من الفصائل
السودانية يعتبر منتج جيد للاكافتوكسين نتيجة للظروف المناخية حيث ترفع درجة الحرارة
والروبية، وزنول العناية بطرق التضاعف والتخزين، وأجريت هذه الدارسات لاستتباع
وجد الآلافتوكسين في علاج الدواجن المستخدمة في مزارع انتاج البضخ

وتقدم في هذا البحث اجراء مسح شامل لسعة مزارع لعلاج البضخ خاصة وحكومية، وهي
مزرعة رضوان - مزرعة يمو - مزرعة الحاج بنجع - مزرعة اسلام بهاوتيج - مزرعة الواسطى
مزرعة المجيد - مزرعة الكوكبان - مزرعة الحاج بنجع - عينات مزروع من العلاقيات المقطعة
للدوافع، وقد تم تفحصها استياعيات وجود الآلافتوكسين (B1، B2، G1، G2) باختبار
السائغ ج. التقييم المبسط، وتلك النتائج على أن:

- 25.8% من مجموع العينات المفحمة قد احتوت على الآلافتوكسين بمستويات مختلفه
- تراجعت بين 50 و 12 ميكروجرام لكل كيلو جرام علفية.
- كل العينات المفحمة احتوت على الآلافتوكسين بفترة زمنية (79.3%) احتوت على بروتين
- بين فئة 1 (36% من الآلافتوكسين) على نتائج آلافتوكسين G2
- ج - بلغت المتوسطات الكلية للآلافتوكسين (B1 + B2 + G1 + G2) لماراجع البضخ يعبيج
- و والإمارات، باختصار الحاج بنجع، والواستي ورنا، وبيرو (ميكروجرام/كيلو
- جرام) 1.63 ± 0.47، 2.35 ± 0.87، 4.21 ± 1.09، 3.42 ± 0.53، 0.12 ± 0.05
- 14.2 ± 2.3، 3.9 ± 1.5

نتيجة لهذه الدراسة التي اثبتت وجود الآلافتوكسين بناوأة الدواجن في علاج الحيوان
الدجاج مهـ. الدوأ توصيفية في مزارع الدواجن إلى سواء التخزين ونحو التغيير في الاجواء الرقمية وذات الحالة
المتوسطة (0.5 - 0.5) لم يعتقد نمو الخطر أصل على النباتات المستخدمة في تكوين
الخضروات للواجع من وجود هذه السوء في الادوات العالية، مما ينتج عن دراسة هذه العوامل في بيئة المصرية للخضروات
الدواجن في مصر، والتي تتعذر من أهم مصادر الوراثي الحيواني في بلادنا ومعظم بلدان
العالم.
AFLOATOXINS RESIDUES IN RATIONS OF CHICKENS' LAYING FLOCKS IN ASSIUT PROVINCE

(With One Table and 4 Photo Illustration)

By
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SUMMARY

In the present investigation, a pilot study was carried out to screen 70 feed samples for the presence of aflatoxins residues by silica gel thin-layer chromatography. Feed samples were collected from various laying chicken farms in Assiut Province. Out of 70 feed samples, 60 (85.7%) were found to contain aflatoxins. Aflatoxin B₁ was detected in all positive samples, B₂ in 22 samples (36.6%), G₁ in 26 samples (60%) and G₂ in 7 samples (11.6%). The lowest aflatoxin level in positive samples was 3.6 μg/kg while the highest was 530 μg/kg. Of the 60 positive feed samples 40, 10, 2, 2, and 2 were involved in compound meal, white corn, bran, horse bean, barley and maize respectively.

INTRODUCTION

The study of fungal toxins and its causative diseases dates back to the Fifteenth Century as ergot invaded grain crops releasing ergotism in man and animals. Mycotoxins have been implicated as causative agents in a number of disease syndroms known as "Animals Mycotoxicosis" (George, 1979).

The aflatoxins are a group of hepatotoxic agents produced by the mold Aspergillus flavus or related species of Aspergillus parasiticus. There have been several individual aflatoxins isolated, but only six are closely monitored according to their toxicity and occurrence in natural products as B₁, B₂, G₁, G₂, M₁, and M₂. These compounds are very similar in structure and were individually named either from their characteristic blue or green fluorescence on TLC plates (Hartley et al., 1963), or from their occurrence in milk of mammary ingesting aflatoxin B₁ contaminated feed which are known as M₁ and M₂ (Allcroft et al., 1986).

Aflatoxins have been detected in feedstuffs by many authors at different areas in the world (De Nogu, et al., 1964; Coomes et al., 1965; Christensen et al., 1973; Fandeylan and Alamo, 1973; Stoloff, 1976; Enami, 1977; Bryden et al., 1980; Sanli et al., 1982 and Abd Al-Haleem, 1983). However, no systematic in-depth survey has been conducted in Egypt. On the other hand, El-Khadem et al. (1979) had reported that more than 50% of the Aspergillus flavus strains were isolated from peanuts in Egypt. In Egypt consideration of the temperature-humidity climates and conditions of foodstuffs production, storage and processing led to the contamination of foodstuffs by aflatoxins (Girgis et al., 1977). Therefore the present study may distinguish the aflatoxins residues in poultry feed of egg producing farms in the vicinity of Assiut province.
MATERIAL and METHODS

1- Sampling:

A total of 70 feed samples were collected separately in clean plastic bags from various governmental and private farms in Assuit province (Bany–Mur, Refa farm, and Military farms for egg production) and (El-Kawkabane farm in Manqabad, El-Westa farm, Islam farm in Abouk, and El-Hag farm in Manqabad laying chicken ones). Ten feed samples from different locations in each examined farm were selected.

2- Standard aflatoxins:

Aflatoxins B1, B2, G1, and G2 were kindly supplied by Dr. Douglas, L.P., Food and Drug Administration, U.S.A. (Dept. of Health, Education and Welfare, Washington, U.S.A.).

3- Determination of aflatoxin:

Residues in feed samples were carried out according to that described in Association of official analytical chemistry methods (1975).

RESULTS

Aflatoxins in chicken meals:

Out of 70 feed samples, 60 (85.7%) were found to contain aflatoxins. Aflatoxin B1 was detected in all positive samples (100%), B2 in 62 samples (88.6%), G1 in 36 samples (51.4%), and G2 in 7 samples (11.6%).

The mean levels of total aflatoxins in feed samples of each examined farm were obtained as (36.16 µg/Kg ± 4.99) in Military farm, (29.25 µg/Kg ± 3.77) in El Kawkabane farm, (26.15 µg/Kg ± 5.26) in Islam farm, (22.4 µg/Kg ± 3.52) in Manqabad farm, (15.6 µg/Kg ± 2.2) in El Wasta farm, (5.15 µg/Kg ± 0.64) in Refa farm and (0.53 µg/Kg ± 0.53) in Bany Mur farm.

These results are tabulated and plotted in Figs. 1, 2, 3, and 4.

It was revealed that 60 out of 70 feed samples collected from poultry farms screened by TLC methods were contaminated with aflatoxins at a varying levels ranging between 3.5-53 µg/kg total aflatoxin. Of the 60 positive feed samples 60 were compound meal (yellow corn, cottonseed, feed additives and concentrates), 10 were white corn, 2 were crushed horse beans, 2 were barley, 2 were maize and 4 were bran. The results of positive samples that contained aflatoxin were 90% in compound meal, 100% in bran, 100% in white corn, crushed horse beans, barley, and maize. While Lafont and Lafont (1970) demonstrated aflatoxins in 167 out of 260 feed samples.

DISCUSSION

The toxicity of fungi, considerable hazard to health associated with liver damage and carcinogenicity. Contamination of pasture and agricultural products with such fungi using an economic losses. The climate of tropical and subtropical countries provides favorable conditions for mold growth and subsequently toxification production. Our study illustrated aspects concerning aflatoxin residues among poultry farm ration in Assuit province.
AFLATOXIN RESIDUES IN RATIONS

SCHROEDER and BOLLER (1973) reported that, groundnuts, cottonseed, rice and sorghum from Texas were sampled over a 3-year period really, aflatoxins were found in groundnut and cottonseed and in two years the later duration in rice and sorghum. 12.7 percent of 306 samples of feedstuffs, feed additives and concentrates, were contaminated with aflatoxin B₁ (STREBEL and GESLOVSKA, 1974). SHREEVE et al. (1975) surveyed feedstuffs for mycotoxins in Britain along two years who detected mycotoxins in 13 out of 131 feed samples. Later on in Poland 8.7% of 150 samples examined yielded aflatoxins (JUSZKIEWICZ and PISZKOCA, 1977).

The high incidence of aflatoxins detected in our examined feed samples (85.7%) in comparison with the previous low figures recorded in the north half of the world can be attribute to the subtropical climate (high temperature and moisture) and bad storage conditions.

Our results are supported by the findings obtained by HORVANTH et al. (1982) who recorded a highly contaminated Egyptian groundnut lot by aflatoxins up to 80%.

It seems obvious from this study that approximately 85.7 percent of the feed samples were contained detectable levels of aflatoxins with some as high as 53 μg/Kg total aflatoxins. This level exceed the maximum permissible limit recommended by FDA in U.S.A for aflatoxin in animal feed as 20 ppb (GERCE, 1979).

In view of the known carcinogenic properties of aflatoxin (TOUCHSTONE, 1979) detection of these compounds in Egyptian animal feed demonstrates potential health hazards to man and animal. Moreover, the presence of relatively low concentration of aflatoxins (3.5-53 μg/Kg) in different Egyptian feedstuffs may result in chronic aflatoxicosis which represents a diagnostically difficult problem to the Veterinarian since many of the syndromes are vague and easily confused with other established diseases.

REFERENCES


### Table (1): Quantitative determination of aflatoxins (µg/Kg) in laying chicken's meal of Assiut province flocks farms.

<table>
<thead>
<tr>
<th>Farm name</th>
<th>B₁</th>
<th>B₂</th>
<th>G₁</th>
<th>G₂</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Military</td>
<td>23.18 ± 3.60</td>
<td>1.87 ± 0.496</td>
<td>4.76 ± 1.025</td>
<td>0.35 ± 0.23</td>
<td>30.16 ± 4.99</td>
</tr>
<tr>
<td>El-Kawkaban</td>
<td>20.23 ± 2.40</td>
<td>1.8 ± 0.34</td>
<td>6.527 ± 1.06</td>
<td>0.695 ± 0.36</td>
<td>29.252 ± 3.77</td>
</tr>
<tr>
<td>Sallam</td>
<td>19.777 ± 3.50</td>
<td>1.61 ± 0.64</td>
<td>4.536 ± 1.31</td>
<td>0.23 ± 0.22</td>
<td>26.153 ± 5.24</td>
</tr>
<tr>
<td>El-Hag</td>
<td>18.72 ± 4.001</td>
<td>0.444 ± 0.304</td>
<td>3.238 ± 1.256</td>
<td>Non</td>
<td>22.402 ± 5.32</td>
</tr>
<tr>
<td>El-Waste</td>
<td>12.144 ± 1.60</td>
<td>Non</td>
<td>3.340 ± 0.807</td>
<td>0.175 ± 0.174</td>
<td>15.659 ± 2.2</td>
</tr>
<tr>
<td>Refa</td>
<td>5.15 ± 0.64</td>
<td>Non</td>
<td>Non</td>
<td>Non</td>
<td>5.15 ± 0.64</td>
</tr>
<tr>
<td>Bany-Mur</td>
<td>0.53 ± 0.53</td>
<td>Non</td>
<td>Non</td>
<td>Non</td>
<td>0.53 ± 0.53</td>
</tr>
</tbody>
</table>

Mean ± S.E.
Photo Illustration (1): Feed ext. from Military farm 1, 2, 3 are sample spot (3, 5, 6.5 ml), 4 is sample (5.5 ml) plus aflatoxin C\textsubscript{1} std. (5 ml) 5, 6, 7 are afl. C\textsubscript{1} stds. (3.5, 5, 6.5 ml).
Sample No. 7.

Photo Illustration (2): Feed ext. from Islaime farm 1, 2, 3 are sample spot, 4 is sample ext. plus afl. C\textsubscript{1} std. 5, 6, 7 are afl. C\textsubscript{1} stds.
Sample No. 10.
Photo Illustration (3): Silica gel TLC plate of feed extract from El-Wasta farm, Spot 1,2,3 are sample ext., Spot 4 is sample ext. plus C₄ std. Spot 5, 6, 7 are aflatoxin G₁ stds.
Sample No. 4.

Photo Illustration (4): Feed ext. from El-Wasta farm 1,2,3 are sample Spots 4 is sample Spot plus C₄ std. 5,6,7 are afl. G₁ stds.
Sample No. 3.