

FEATURE

kits after preliminary evaluations showed five kits would meet requirements for testing corn. Tentative plans are to be using the kits to test the 1989 corn crop, if bidding and acquisition procedures can be completed in time.

FGIS announced in mid-July it would seek bids on the EZ-Screen, Aflatest and Afla-20-Cup kits. Two other kits, SAM-A and OXOID, also passed FGIS test requirements to indicate excess of 20 ppb aflatoxin. The kits are to

be used at 38 FGIS service point, replacing minicolumn and TLC methods. Another 13 kits are to be used at ten export field offices and three other offices that receive requests to test corn for aflatoxin.



European perspective on aflatoxin

The European Economic Community established severe limits in 1988 on aflatoxin contamination in raw materials imported for use as feedstuffs or for other purposes. When the new rules were announced, many traditional suppliers of such materials complained the rules would drastically cut their trade with Europe. This study of U.K. and EC legislation on aflatoxin was prepared by the U.K. Ministry of Agriculture, Fisheries and Food in London to explain the background and previous regulatory steps that led to current legislation on aflatoxin.

Mycotoxins will be a familiar subject to many. Others may like to be reminded that mycotoxins are toxic compounds produced by molds. Aflatoxins, in turn, are a group of mycotoxins, generated by some strains of *Aspergillus flavus* and *A. parasiticus*.

Aflatoxins have been found in many crops. But the known problems are more acute in tropical and subtropical products—corn, cotton and peanuts, for example, have been cited. The problem is often exacerbated by storage in hot or humid conditions.

Aflatoxins have been put forward as causes of liver cancer and acute liver damage in Third World countries. No clear-cut link has yet been established between man and contaminant, but the connection forms the basis of governmental risk management strategies.

U.K. approach

Aflatoxin contamination affects both animal feeds and some human food and is a subject which is taken seriously in the United Kingdom and in the European Community. The legislation on animal feeds aims to protect the food chain—

that is, to preserve the quality of the ultimate products consumed by humans. Legislators also must consider the impact on the farm animal, both from the point of view of the animal's own welfare, and the implications for the farmer.

Attention has focused particularly on contamination in animal feeds by aflatoxin B₁. This is the most common of the aflatoxins, and the most carcinogenic in animal tests. It was first identified in the 1960s, in the U.K., following the death of over 100,000 young turkeys and ducks who had fed on peanut meal. And we now know of the possibility of onward contamination of milk by the metabolism of aflatoxin B₁ to aflatoxin M₁ in dairy cattle.

Controls of final feeds

In 1973, the European Community passed legislation prescribing maximum permissible levels of aflatoxin B₁ in various types of animal feeds. This coincided with the U.K.'s entry to the EC and therefore applies in the U.K. There have been some amendments and additions but the basic framework remains unchanged and applies across all of the 12 member countries of the

EEC. Examples of the upper limits allowed are 0.01 mg/kg for complete and complementary dairy feeds and 0.05 mg/kg for straights (each with reference to a moisture content in the feed of 12%).

Controls on raw materials

There are also controls on some raw materials, used in the manufacture of animal feeds. There have been changes recently but the basic aim remains the same—to reinforce the controls on animal feeds generally, and so to protect the safety and quality of animal feed and of the human food chain.

In the late 1970s it was clear that the U.K. had a problem with milk. The monitoring program of milk showed that too many samples contained aflatoxin. It was thought that the culprit was the presence of aflatoxin B₁ in dairy feeds: when dairy cattle are given rations contaminated with aflatoxin B₁, then the metabolite aflatoxin M₁ is excreted into the milk. Peanuts and cottonseed—raw materials used in the manufacture of dairy feeds—were thought to be the sources of the contamination. The U.K. therefore introduced a ban on the import of peanuts or cottonseed containing detectable traces of aflatoxin B₁. This was shortly adapted to a ban on imports of peanuts when contaminated at a level above 0.05 mg/kg.

The policy of controlling the raw material was highly successful: aflatoxin contamination of milk was reduced dramatically. Of sam-

FEATURE

ples taken between 1977 and 1979, 75% contained detectable levels of aflatoxin; between 1981 and 1983 findings fell to 4%.

New raw material controls

The U.K. raw material controls were replaced at the end of 1988 by common controls across the whole of the EEC. Individual member countries had attempted to deal with the aflatoxin problem in different ways. But the aim of introducing an EC common market requires a common approach.

In attempting to draw together proposals for a harmonized approach, the EC Commission had to take into account the different historical trading patterns of the member countries (often based on old colonial links) and the emergence of less well-known materials. Very importantly too, the Community was aware that many materials have their origins outside Europe, often in less developed countries.

Legislative controls were introduced on six raw materials namely peanuts, copra, palm kernel, cottonseed, babassu and corn (maize) and any derivations of these. Effectively, a two-tier trading system was set in place. In general, when these materials are sold for feed they may not contain more than 0.05 mg/kg of aflatoxin B₁. However, there are exceptions. When contamination lies between 0.05 mg/kg and 0.2 mg/kg sales may be made, but only to manufacturers registered with the authorities. In the U.K., this register is called the "National List of Compound Feed Manufacturers." The intention is that registered manufacturers have met specified technological criteria: the authorities need to be satisfied that manufacturers have the equipment and expertise to handle and store the contaminated materials properly, and to mix them adequately with others in order to dilute contamination to more acceptable levels. This system meets a balance of interests. It aims to protect public health while allowing regulated trade in the contaminated materials: the interests of exporting countries are thus taken into account.

The future

The framework setting maximum permissible levels of aflatoxin B₁ in finished feeds is well established. The impact of the new controls on raw materials has yet to be tested—they have been in force for less than a year. The U.K. testing system includes continuous monitoring of milk. The U.K. also carries out pe-

riodic surveys of commercially produced compound animal feeds and their raw materials. Legislative action now falls primarily to the European Community as a whole although measures may be taken by individual member countries. There are no plans at present for further legislation.

Edible Fats and Oils

The Color of Quality

LOVIBOND® has provided Edible Fats and Oils industry color grading scales for over 60 years.

Tintometer AF710 conforms to AOCS manual color method Cc 13b-45 for:

- fats
- fatty acids
- fruit oils
- greases
- marine oils
- mineral oils
- nut oils
- seed oils
- tallows
- vegetable oils



LOVIBOND® Tintometer nephelometric turbidity measuring instruments provided with proper calibration chart conform to AOCS Ca19-86.

Also available: NEW spectrophotometric instrument for color analysis of all liquids

- 16 filters establish CIE values in L*a*b*, L*u*v*, Yxy
- Computer converted to color values in Lovibond®, AOCS, FAC, Gardner, APHA, USP, chlorophyll A-B & Beta-Carotene.

For further information and the name of your local distributor contact:

The Tintometer Company

Testing the Oils of the World

309A McLaws Circle Williamsburg, Virginia 23185
Telephone 804-220-2900 TWX: 7108822260 Lovibond® WMBG
FAX: 804-229-0472

