ADVISORY COMMITTEE ON ANIMAL FEEDINGSTUFFS

Twelfth Meeting of ACAF on 5 December 2001 – Agenda Item 6

AFLATOXINS IN WILD BIRD FOODS

**Action:** The Committee is invited to note this issue and agree that the Agency should consult interested parties for their views on setting specific MPLs for aflatoxins in wild bird foods.

**Secretariat:** November 2001
AFLATOXINS IN WILD BIRD FOODS

Purpose

1. To invite ACAF to consider the issues concerning aflatoxin B\textsubscript{1} in wild bird foods and agree the action proposed in paragraphs 12-14.

Background

2. Aflatoxins are naturally-occurring toxicants produced by certain moulds on food and feed commodities grown in warm, humid conditions. Aflatoxin B\textsubscript{1}, the most toxic aflatoxin, is a potent carcinogen and there is evidence that it is a genotoxic human carcinogen (ie a chemical agent that adversely modifies DNA).

3. EC legislation sets maximum permitted levels (MPLs) for aflatoxins in peanuts (groundnuts), nuts, dried fruit and cereals for human consumption. There are also MPLs for aflatoxin B\textsubscript{1} in EC legislation for a range of feedingstuffs set out in Directive 1999/29/EC and these are implemented in England in the Feeding Stuffs Regulations 2000 (Scotland, Wales, and Northern Ireland have parallel Regulations). The scope of the legislation covers feeds for wild animals including wild bird food.

Issues

4. Controls on feeds for wild birds are not specified separately in Directive 1999/29. When the scope of the Directive was extended to wild animals in 1991 the MPLs for various types of farmed livestock feeds automatically applied to wild bird foods (these and other levels referred to in this paper are set out in Annex A). However as far as we are aware there has been no scientific risk assessment or review to determine if these levels are appropriate to wild birds. Certain ingredients of foods sold for wild birds can be susceptible to aflatoxin B\textsubscript{1} contamination. These are principally peanuts (groundnuts) but aflatoxin contamination can also occur in maize products and to a lesser extent, sunflower seeds.

5. Unlike livestock feeds, wild bird foods are mainly sold at retail level. People who buy them for wild bird feeding may potentially consume some themselves. MPLs for peanuts for human consumption are set at lower levels than for animal feeds. The feed MPL is 0.02 mg/kg (ie 0.02 parts per million) while the food MPL is 0.002 mg/kg (ie 0.002 parts per million). There have been cases of peanuts destined for human consumption exceeding this second level, and being diverted for wild bird feed.
6. Scientific information on the susceptibility of wild birds to aflatoxins is not extensive. Some information mainly received via a major manufacturer of wild bird foods is shown at Annex B. In the UK the Bird Food Standards Association have considered the MPLs set in Directive 1999/29 to be too high for wild birds. Under a voluntary code, therefore, they have set a level of 0.005 mg/kg for aflatoxin B₁ which was based on the MPLs in force for human consumption at the time.

Discussion

7. The current MPLs for aflatoxin B₁ set out in Directive 1999/29 were not set with wild birds in mind and there must be doubt about their appropriateness for this category. Evidence suggests that birds such as chickens, ducks and turkeys are more susceptible than mammals to adverse effects from aflatoxins. Moreover, unlike livestock feeds, wild bird foods are purchased by the public and there is the potential for these products to be consumed by them. Although any affects of consumption by humans are likely to be chronic (ie after accumulation over a long period) there appears to be a case to align wild bird MPLs more closely with the maximum levels for peanuts for human food.

8. Individual groundnut and sunflower seeds marketed and fed as single products may contain high levels of aflatoxin B₁ and therefore an MPL appropriate for wild birds should be set for these feed materials and any other material that could be fed singly to wild birds. Also there should be an appropriate MPL for complementary feeds since wild bird foods are also sold in mixtures of ingredients.

9. The difficulty is determining the MPLs that should be applied to wild bird foods. Levels should as far possible be based on risk analysis but there is limited scientific literature in this area. Also any MPLs set have to be proportionate to the needs. A forthcoming EC measure will ban the blending down of consignments with aflatoxin B₁ above MPLs and this would mean that any consignments found to be above the MPLs would be rejected and would probably need to be destroyed or re-exported.

10. There appears to be a number of options. A case might be made to set the MPLs for feed materials at 0.01 mg/kg which is the same level as the complete feedingstuffs MPL already set for poultry chicks which may be a category of animal comparable to wild birds. Alternatively the Bird Standards scheme sets an MPL of 0.005 mg/kg. This is the level at which there has been circumstantial evidence of effects of aflatoxins on wild birds (see Annex B). It is also in line with the existing MPL that covers complementary feeds for wild birds. Under both proposals the complementary feed maximum level would stay at 0.005 mg/kg. Taking
into account the human health implications there might be a case to align levels for feed materials and complementary feeds with the human consumption limits (0.002 mg/kg).

11. Although aflatoxin B₁ is the most toxic aflatoxin, the Bird Food Standards Association sets a maximum level for other types of aflatoxins (aflatoxin B₂, G₁, G₂). There is also an EC maximum level for total aflatoxins in peanuts for human consumption (aflatoxin B₁, B₂, G₁, and G₂). It is therefore perhaps necessary to investigate whether an MPL for total aflatoxins should be set for wild bird food.

Proposal

12. Changes to MPLs would require amendment to Directive 1999/29 and would have to be agreed in Brussels. In order to draw up a case for eventual submission to the European Commission and other Member States it is proposed that the Food Standards Agency should go out to consultation and seek the views of interested parties.

13. The consultation would ask for views on reducing the aflatoxin B₁ MPL for all feed materials and complementary feeds for wild birds mentioning the options mentioned in paragraph 10 above.

14. The consultation would also ask for:

   (a) any information on the susceptibility of wild birds to aflatoxin B₁ and other aflatoxins which would determine which of the above (or alternative) proposed MPLs should apply;

   (b) information to help the Food Standards Agency draw up a regulatory impact assessment. For example the costs to traders of the introduction of any MPLs or if there would be any significant rejections of consignments; and

   (c) data on current levels of aflatoxin B₁ in wild bird food.

Action

15. The Committee is invited to note this issue and agree that the Agency should consult interested parties for their views on setting specific MPLs.
for aflatoxins in wild bird foods. It would also be helpful to know if the Committee could suggest any sources of information on the susceptibility of wild birds to aflatoxins.

Animal Feed Unit
Food Standards Agency
November 2001
AFLATOXIN B₁

Current MPLs which apply to wild bird foods

**Feed materials:** (with the exception of groundnut, copra, palm kernel, cotton seed, babassu, maize and products derived from the processing thereof)

<table>
<thead>
<tr>
<th>Commodity</th>
<th>MPL (mg/kg)</th>
<th>MPL (µg/kg)</th>
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</thead>
<tbody>
<tr>
<td>Feed materials:</td>
<td>0.05</td>
<td>50</td>
</tr>
<tr>
<td>groundnut, copra, palm kernel, cotton seed, babassu, maize and products derived from processing thereof</td>
<td>0.02</td>
<td>20</td>
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</tbody>
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**Complementary feedingstuffs**

<table>
<thead>
<tr>
<th>Commodity</th>
<th>MPL (mg/kg)</th>
<th>MPL (µg/kg)</th>
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<tbody>
<tr>
<td></td>
<td>0.005</td>
<td>5</td>
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There is also a level of 0.01 mg/kg (10 µg/kg) for complete feeds but in practice we understand that complete feeds for wild birds are rarely marketed as such. However, amongst other animals, this level is applied to poultry chicks.

**Bird Food Standards Association Code**

<table>
<thead>
<tr>
<th>Commodity</th>
<th>MPL (mg/kg)</th>
<th>MPL (µg/kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feed Materials and Complementary Feeds</td>
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<td>5</td>
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**Human Consumption MPLs**

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<thead>
<tr>
<th>Commodity</th>
<th>MPL (mg/kg)</th>
<th>MPL (µg/kg)</th>
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</thead>
<tbody>
<tr>
<td>Peanuts</td>
<td>0.002</td>
<td>2</td>
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**Proposals for MPLs for wild bird foods**

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<tr>
<th>Commodity</th>
<th>MPL (mg/kg)</th>
<th>MPL (µg/kg)</th>
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<tbody>
<tr>
<td>Feed materials</td>
<td>0.01</td>
<td>10</td>
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<tr>
<td>or</td>
<td>0.005</td>
<td>5</td>
</tr>
<tr>
<td>Complementary feeds</td>
<td>0.005</td>
<td>5</td>
</tr>
<tr>
<td>or</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feed materials and Complementary feeds (equivalent to the human food limit)</td>
<td>0.002</td>
<td>2</td>
</tr>
</tbody>
</table>
**Bird Feeding and Aflatoxins**

1. Depending on the calorific content of the food, small birds need to consume up to 40% of their body weight each day in order to survive. This percentage decreases with increasing body size, so it is much smaller in larger bird species. Within species, daily food needs also vary with temperature and other weather factors, with the general activity of the bird and with whether it is laying down reserves for migration or breeding.

2. Because aflatoxins are normally absorbed into the body fat, they could in theory be released very rapidly as the fat is consumed during migration. In a study feeding $^{14}$C-labelled aflatoxin to White Leghorn hens, approximately 10% of the administered dose was retained in the liver, kidney, bone marrow and lungs after 6 hours, while the brain, muscle and body fat contained a combined total of less than 1% of the radioactivity (Harland, E.C. et al. Excretion of 14 labelled aflatoxin B$_1$ via bile, urine and intestinal contents of the chicken. Am. J Vet Res., 1975, 36, 909 et seq). Toxins might then reach a lethal level in the bloodstream, resulting in the death of the bird. Death of birds through the release of toxin from body fat has been established for certain fat-soluble contaminants, such as organochlorine pesticides, but not so far for aflatoxins.

3. Studies indicate that avian species such as chickens and particularly ducks and turkeys are very susceptible to the acute effects of aflatoxin. For example the single oral dose resulting in 50% mortality over a 7 day period following administration of pure aflatoxin B$_1$ to day-old ducklings is 0.33 mg/kg body weight. At lower doses aflatoxin ingestion by poultry leads to impaired growth rate and feed efficiency and adverse effects on the immune system.

4. Although it is not known exactly at what level of contamination aflatoxins begin to affect wild birds, but there is circumstantial evidence to suggest that at 5 µg/kg in the diet they cause carcinoma of the liver and eventually death in small finches such as siskins (*Carduelis spinus*). However, different species of birds are likely to vary in their susceptibility to aflatoxins, depending on their particular physiology and metabolism; and within-species susceptibility may vary according to the weather and to stage of the annual cycle.