

**ADVISORY COMMITTEE ON ANIMAL FEEDINGSTUFFS**

**45th Meeting of ACAF on 4 March 2009**

**Information Paper**

**Potential for carry-over of allergens from animal feed into  
derived animal products**

**February 2009**

## **Potential for carry-over of allergens from animal feed into derived animal products**

### **Purpose**

1. This paper updates the Committee on progress regarding the Agency's consideration of the potential for carry-over of allergens from animal feed into derived animal products, which the Committee last discussed in November 2006. Since that time, a desk-based investigation to establish the level of peanut/groundnut<sup>1</sup> use in animal feeds in the UK has been commissioned. The rationale for this work was to inform the Agency's view as to whether scientific research should be funded to examine the risk to food allergic people from allergens from animal feeds carrying over into milk or meat of animals entering the food chain. The results of this investigation are now available and attached at Annex 1.

### **Background**

2. The Food Allergy Team at the Food Standards Agency has over recent years received a number of queries from food allergic consumers about the possibility that allergenic proteins consumed by animals in their feed may be carried over into the milk or meat consumed by humans; and that this could trigger an allergic reaction. The primary concern was with peanut allergens in ruminant feed transferring to cows' milk and beef entering the food chain. Following consultation with clinical scientists in this field, the Agency was advised that while there was no evidence of such reactions occurring in the community, there was a theoretical risk that such carry-over could occur.
3. At the November 2006 meeting of ACAF the Committee gave a view on whether research in this area should be conducted by the Agency. The Committee suggested that research in this area would be both useful and feasible. It was the Committee's recommendation that before research investigating this issue was commissioned, the level of allergens (specifically peanut) used in animal feed in the UK should be assessed. In light of this recommendation, a short desk-based investigation was commissioned by the Agency and undertaken by Bruce Cottrill of ADAS.

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<sup>1</sup> The term peanut is used in this paper to mean ground nut, peanuts and monkey nuts

## Progress

4. The desk-based investigation is now complete and the report written by the contractor is attached as Annex 1. Key questions on the use of food allergens in feed were investigated, based on the concerns raised by consumers. These were:
  - how much of feed produced to supplement dairy cattle diets in the UK contains peanuts or peanut derivatives as an ingredient?
  - at what level are peanuts used in these feeds (either as a percentage or an amount)?
  - do the peanuts in the diet of cattle provide specific benefits, e.g. ease of digestion or providing specific nutrients?
  - how widespread is the use of fishmeal or other fish derived products in order to increase the level of omega 3 fatty acids in milk?
  - how widespread is the use of soya in chicken /poultry or game feed?
5. From the information provided, it appears that peanuts and peanut meal are not being used to any extent in animal feed in the UK. This reflects that the UK is not processing peanuts to make peanut oil (of which groundnut meal is a by-product). As a result of this, the cost of groundnut meal in the UK is prohibitively expensive and peanut meal is therefore less available than other seed oil meals, such as soya, for use in animal feed (ruminant, porcine and poultry feeds). In addition, due to the strict EC regulations on the maximum permitted levels of aflatoxin contamination in peanuts, feed producers have moved away from using peanuts in animal feeds over the last ten years due to the greater risk of cross-contamination with aflatoxins in groundnuts.
6. There remains an uncertainty as to how widely groundnuts may be used in ruminant feed in other countries. This would suggest that there is a theoretical risk that milk and meat from outside the UK could contain peanut residues, if peanuts were being used in feed in these countries. However, it is our understanding that milk is not routinely imported into the UK and as such this is unlikely to be an issue for milk.
7. The information provided would suggest that soya meal is routinely used in chicken feed and may also be used in other animal feedingstuffs. The information in the report suggests that soya is used in chicken feed at the level of 18% of the total diet. It would also suggest that that fish oil is not used routinely in terrestrial animal feed due to digestibility issues and the cost of this commodity.

### **Agency View**

8. On the basis of above, it seems that groundnuts are not commonly used in animal feeds in the UK. This would suggest that in the UK, it is unlikely that there is allergen carry-over from groundnuts in ruminant feed to milk or meat. As such, the need for further research in this area does not appear to be a high priority.
9. There remains an uncertainty as to the use of groundnuts in both ruminant and poultry feeds in other countries and whether, if this occurs, it might lead to carry-over into meat exported into the UK market.
10. A potential issue from the information provided is the use of soya meal in all animal feeds, but specifically poultry feed, and whether this might lead to carry-over of soya protein into meat or eggs. This is an issue that could potentially warrant research. However, from the information available on thresholds of reaction to soya, it would seem that the proteins, if present, would need to be transferred at relatively high levels to provoke reactions in soya allergic people. In the light of this, the Agency does not consider that the strategic need for research in this area is strong.

### **Recommendations**

11. Currently, there is not a pressing need for further research into the possible allergen carry-over from groundnuts in ruminant feed to milk or meat. This reflects the fact that peanuts and peanut meal are not currently found in the diet of these animals in the UK.
12. Research on soya protein carryover from animal feed to eggs or meat would represent “an even lower priority” for the Agency’s research programme.

ACAF Secretariat  
February 2009

## **The use of groundnuts and groundnut meal<sup>2</sup> in livestock rations.**

### *Background: production and trade of groundnuts and groundnut products*

#### Groundnuts

- World production of groundnuts was 32.2 million tonnes in 2007/08<sup>3</sup>. Production has remained fairly consistent over the past ten years.
- China is the world's largest producer of groundnuts with 40% (13 million tonnes) of world production, followed by India (6.6 million tonnes), Nigeria, USA and Indonesia (between 1.1 and 1.6 million tonnes each).
- The EU<sup>4</sup> imported 570,000 tonnes groundnuts in 2007. Levels have remained fairly static over the past decade (Figure 1). Half of all imports were from Argentina, and 26% from PR China.
- Almost half of all imports into the EU (47%) were to The Netherlands. It is unlikely that all would have been used there, but would have been re-exported to other European countries.
- The UK imported 84,000 tonnes of groundnuts in 2007.

#### Groundnut meal

- World production of groundnut meal was 5.8 million tonnes in 2007/08, and has remained fairly consistent in the past decade.
- The main producers of groundnut meal (2007/08) were the PR China (2.6 million tonnes), India (1.9 million tonnes).
- The main exporter of groundnut meal is India (165,000 tonnes 2007/8); the main importer is PR China (100,000 tonnes).
- Imports of groundnut meal to the EU are indicated in Figure 1. Imports in 2007 were 84,000 tonnes<sup>5</sup>.
- Almost all of the groundnut meal imported into the EU is from Senegal. In the past decade small amounts (<10,000 tonnes per annum) have been imported from Argentina, but none since 2003, and the Sudan (none since 2002)<sup>6</sup>.
- Most (88%) of EU imports of groundnut meal were to France<sup>7</sup>.
- Imports of groundnut meal into the UK declined from 24,000 tonnes in 2001 to 7,000 tonnes in 2004, and none has been imported since then<sup>8</sup>.

#### Groundnut oil

- Groundnut oil is thinly traded in international markets, because the major producers (China, India and the USA) consume substantial amounts in their

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<sup>2</sup> Also known as peanut and peanut meal, monkey nuts and monkey nut meal

<sup>3</sup> Source: USDA

<sup>4</sup> EU-27

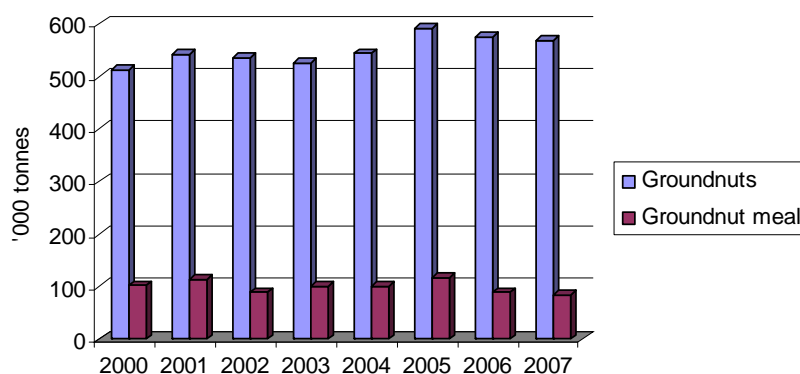
<sup>5</sup> Source: USDA

<sup>6</sup> Source: Eurostat

<sup>7</sup> Source: Eurostat

<sup>8</sup> Source: Eurostat

domestic markets. The export trade of oil in developing countries is concentrated in Senegal and the Sudan.



**Figure 1:** EU imports of groundnut and groundnut meal, 2001-2007 (Source: Eurostat)

## Groundnuts and groundnut meal

### Groundnuts

Groundnuts are grown for two very different markets, for confectionary<sup>9</sup> and for oil extraction, and the qualities required are markedly different. For confectionary use, cultivars producing a relatively low-oil nut with high protein and sugar contents are preferred. Nuts for oil extraction, on the other hand, should have a high oil content. The oil is primarily used for cooking, but it is also used in some cosmetics. Its major component fatty acids are palmitic acid, oleic acid, and linoleic acid.

Groundnuts imported into the UK are used primarily for human consumption, where they are used in a wide range of food and confectionary products. Industry sources indicate that none of the groundnuts imported into the UK is processed for oil extraction<sup>10</sup>, and therefore no meal will be produced that could be used as animal feed.

Groundnuts are also widely used as bird feed.

### Groundnut meal

The meal remaining after oil extraction is granular, with a brown/dark brown colour. It contains a relatively high protein content (typically 42- 50%, depending on how it is processed<sup>11</sup>). Levels of essential amino acids, particularly lysine and methionine, are lower than in other commonly used oilseed meals (soybean meal, rapeseed meal) making it less suitable as a feed for non-ruminants (pigs and poultry), although

<sup>9</sup> The generic term “confectionary” includes all groundnuts intended for human consumption in forms other than oil (Fabre and Mayeux 2006)

<sup>10</sup> Source: Graeme Leslie, United Oilseeds, *personal communication*

<sup>11</sup> This compares with typical protein contents of 38% and 50% protein for rapeseed and soybean meals, respectively.

analyses can vary widely according to the source of the material. In ruminants, the protein is more rapidly degraded than that in soybean or rapeseed meals. In countries where it is available, it is generally only used as a feed for cattle, at up to 10-15% inclusion of the diet<sup>12</sup>.

Groundnuts and their derivatives are particularly susceptible to contamination with mycotoxins, and in particular aflatoxin. In the 1980's the European Commission established maximum limits for aflatoxin B<sub>1</sub> in animal feedstuffs, including groundnut meal<sup>13</sup>. Partly as a result of the risk of contamination, European animal feed manufacturers switched from groundnut meal to other protein sources.

### **The use of groundnuts and groundnut meal in livestock rations**

The following replies are in response to specific questions raised. Note that whole groundnuts are not used as animal feeds, and therefore these responses refer to *groundnut meal*.

1. How much of feed produced to supplement dairy cattle diets in the UK contains peanuts or peanut derivatives as an ingredient?	We believe that no groundnut meal or groundnut derivatives are currently being used in the manufacture of dairy cattle feeds, and have not been for some years. The risk of contamination with aflatoxin, coupled with a ready supply of alternative high-protein feeds, has led to a steady decline over the last 20 years in the use of groundnut meal as a feed material to the point where none is used today.
2. At what level are peanuts used in these feeds (either as a percentage or an amount)?	If they were available, their use would be determined by the price of the meal relative to the price of other oilseed meals, up to a maximum of 10-15% inclusion in compound feeds. For a high yielding dairy cow at peak lactation, this would be a maximum of ~2 kg groundnut meal/day.
3. What is the likelihood that peanuts would be present in dairy cattle feed from cross-contamination with other feeds?	It is unlikely that there would be any cross-contamination with other feeds because (a) no groundnuts or groundnut meal are used in the manufacture of livestock feeds, and (b) oil extraction is generally undertaken in dedicated plants, away from other potential animal feeds.
4. How much feed produced to supplement beef cattle diets in the UK contains peanuts or peanut derivatives as an ingredient?	None that we are aware of.

<sup>12</sup> Source: Worldwide sources of oilseed meals for feed manufacturing In Proceedings of the World Conference on Oilseed Technology and Utilization (Ed. T.H. Applewhite), 1992

<sup>13</sup> The current maximum limit for aflatoxin B<sub>1</sub> in groundnut meal is 0.2 mg/kg (Council Directive 1999/29/EC of 22 April 1999 on the undesirable substances and products in animal nutrition)

5. At what level are peanuts used in beef cattle feed either as a percentage or an amount?	Maximum recommended inclusion rate of groundnut meal in beef cattle rations is ~15-20% of the compound or concentrate mix. However, this would typically represent only 20-30% of the total dry matter consumed; therefore it is unlikely that groundnut meal would constitute more than 6-7% of total dry matter intake. For a 300 kg steer on a high plane of nutrition, this would represent a maximum of ~1 kg/day.
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If peanuts are used:

6. Are they used to add specific ingredients to the milk, e.g. fatty acids?	No, they are used primarily as source of energy and protein.
7. Do the peanuts in the diet of cattle provide specific benefits e.g. ease of digestion or providing specific nutrients?	Groundnut meal is used principally as a source of energy and protein. It has higher energy and protein contents than rapeseed and palm kernel meals, but are lower than soybean meal. Groundnuts are exceptionally rich in vitamin B <sub>3</sub> , but microbial synthesis of the B vitamins in the rumen is thought to satisfy the ruminant's requirements and therefore no additional benefits arise from this. We are not aware of any other claims made for the benefits of feeding groundnut meal to cattle.
8. Is the use of peanuts in the diet of cattle a result of seasonal pressures or cost motivation?	For feed manufacturers the use of groundnut meal in cattle diets would be justified principally on the basis of the financial value of the energy and protein in groundnut meal relative to that in other oilseed meals.
9. What would be the implications if peanuts were no longer used in cattle feed?	To the best of our knowledge groundnuts are not used as an ingredient in cattle feed.
10. How much is likely to transfer to meat?	No clear what is being asked here – how much of what?

Secondary questions:

11. How widespread is the use of fishmeal or other fish derived products in order to increase the level of omega 3 fatty acids in milk?	The use of fishmeal is currently not permitted in dairy cow diets.  Fish oil is not used as an ingredient in cattle rations. This is partly a reflection of price, but is also due to the reductions in feed intake and digestibility that have been associated with its use.
12. How widespread is the use of soya in	Soybean meal is widely used in poultry



chicken /poultry or game feed?	rations because of its good amino acid profile. Typical inclusion rates range are: Game birds 12% Layers 15% Broilers 18% Turkeys 26%
13. How widespread is the use of peanuts in chicken feed?	We are not aware that any groundnut meal is currently being used in the manufacture of poultry feed in the UK. It is used in countries where groundnuts are grown and processed, although the relative low levels of essential amino acids (particularly lysine and methionine relative soybean meal) mean that if high levels of production (growth rates, egg production) are to be achieved the ration needs to be supplemented with these amino acids. These may be provided as synthetic amino acids, but doing so adds to the cost of the ration. Maximum recommended inclusion rates for groundnut meal in poultry rations vary from a maximum replacement rate of soybean meal of 10% <sup>14</sup> , to 5% in broiler and 2.5% in layers rations <sup>15</sup> .

**B R Cottrill**  
9 December 2008

<sup>14</sup> Bell, D.D., Weaver, W.D. and North, M.O. (2002). Commercial Chicken Meat and Egg Production, Springer Publications

<sup>15</sup> Ewing, W.N. (1989). The Feeds Directory. Context.