LOCAL AUTHORITY SAMPLING AND ANALYSIS PROGRAMME FOR ANIMAL FEEDS – VITAMIN A

Background

1. In the UK, the Food Standards Agency is responsible for controls on the composition and labelling of animal feeds, principally with a view to protecting the health of the ultimate consumer of meat and other produce of animal origin. The UK and EC statutory controls also help prevent adverse effects on animal health or welfare, e.g. through contamination, or use of unauthorised additives.

2. In Great Britain enforcement of controls is undertaken by trading standards departments of local authorities, whose responsibilities include approving and registering animal feed premises and carrying out tests on feed and feed ingredients. There are separate arrangements for enforcement in Northern Ireland, where responsibility lies with the Department of Agriculture and Rural Development. The Agency views the enforcement of feed controls as an important means of ensuring that any risks to animals and indirectly to human consumers from animal feed are effectively minimised. In 2001, the Food Standards Agency announced that additional funding of £7.5 million was to be provided to local authorities over a period of three years. For 2001/2 it was decided to use the funds for a special programme, involving local authorities in Great Britain, which focused on the analysis of a range of contaminants (undesirable substances) and additive levels in a variety of feeds and feed products.

The Programme

3. In October 2001 the Food Standards Agency wrote to local authorities in England, Scotland and Wales inviting bids for the sampling and analysis of compound (i.e. manufactured) feeds and feed materials. In response, 87 local authorities (56 English, 10 Welsh and 21 Scottish) decided to participate in the programme.

Sampling and analysis

4. Sampling was mainly undertaken in the period January to March 2002. In total, some 3,736 samples were taken. Levels of approximately 90 different substances or groups of substances were determined. In all there were approximately 30,000 individual analysis results, which had to be double-checked. Brief summaries of the findings of the participating local authorities are to be provided by the Agency as

separate reports for each substance or group of substances. These will be published by the Agency shortly.

SACN Advice

5. The summary report for Vitamin A is being made available now, due to its relevance to the Scientific Advisory Committee on Nutrition's (SACN) draft Review of Dietary Advice on Vitamin A that is being published at this time. SACN (with input from the Advisory Committee on Animal Feedingstuffs) has concluded that there is currently insufficient evidence on the association between bone health and high vitamin A intakes to justify a change in dietary advice to all consumers regarding consumption of vitamin A-containing foods or supplements. However, recommendations for particular sectors of the population are included in the SACN draft, as is a recommendation to review further the possibility of reducing vitamin A content of poultry and livestock feed. Such a review would need to take into account both the dietary requirements of livestock and the need for animal produce to provide an appropriate contribution to consumers' diets. Further information is available on the SACN website: www.sacn.gov.uk.

Further Action

6. The Agency has already written to participating local authorities about some of the results obtained under this programme, in particular those found to be in excess of maximum permitted levels. Local authorities were asked to consider whether to take action from an enforcement perspective (if not already done so) in respect of the results in breach of statutory requirements. Examples of possible follow-up action included the taking of further samples of similar materials or exploring with feed companies or farms what action had been or would be taken to avoid such breaches in future.

7. Once all of the summary reports have been published, the Agency will discuss the results and any further actions that may be required with representatives from local authorities and the feed industry to further improve compliance with statutory controls. In addition, sampling and testing for vitamin A in feed will be included in the FSA's recommended priority areas for local authority feed law enforcement activity, as part of the National Inspection Programme for 2005/6.

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Vitamin A

Summary
1335 samples of feed products were analysed by local authorities for their vitamin A content. 78 of these were found to contain vitamin A in excess of legal limits.

Introduction

Vitamin A, also known as retinol, occurs in mammals and other vertebrates as a consequence of the conversion by the intestinal wall and liver of the carotenoids provided by green plants. Vitamin A can also be extracted from fish liver oils, where it occurs mostly in esterified form, and fed as a supplement in both human and animal nutrition. Deficiency of vitamin A can affect health, for example it can impair vision. However, for humans and livestock it can lead to unwanted effects if taken in excess. For example, exposure to high levels of vitamin A may contribute to reduced bone density in certain sections of the population. The Scientific Advisory Committee on Nutrition (SACN) has now provided draft advice that there is currently insufficient evidence on the association between bone health and high vitamin A intakes to justify a change in dietary advice to all consumers regarding consumption of vitamin A-containing foods or supplements. However, recommendations for particular sectors of the population are included in the SACN draft (see SACN website for further information: www.sacn.gov.uk).

Statutory maximum levels

The presence of vitamin A in animal feed was, at the time of sampling and analysis, controlled in the EC by Council Directive 70/524/EEC concerning additives in feedingstuffs, which is implemented by The Feeding Stuffs Regulations 2000. Part IV of Schedule 3 to these Regulations lays down the maximum permitted levels (MPLs) for vitamin A in complete feeds for various species of farmed livestock and the conditions under which it may be fed. These levels remain applicable under the current EU rules on additives in feedingstuffs, namely EC Regulation 1831/2003, which has replaced Directive 70/524. The maximum levels are as follows:

Kind of Animal permitted	**Maximum vitamin A content (international units per kilogram in complete feeding stuff) or of the daily ration**	**Conditions**
Chickens for fattening	13500	All feeding stuffs except those for young animals.
Ducks for fattening	13500	*ditto*
Turkeys for fattening	13500	*ditto*
Lambs for fattening	13500	*ditto*
Pigs for fattening	13500	*ditto*
Bovines for fattening	13500	*ditto*
Calves for fattening	25000	Only milk replacers

Other species of animals	-	All feeding stuffs

Summary of results

1335 samples were taken by local authorities and analysed for vitamin A content. The results are summarised below.

Levels of vitamin A found in a range of feed types.

Feed product type	No. of samples	MPL for VA (iu/kg)	Number (percent) exceeding MPL	Range (iu/kg)
Complete feeds for: Poultry (chicken, turkey, ducks) for fattening	107	13,500	16 (15%)	3,116 – 133,900
Lambs for fattening	9	13,500	1 (11%)	5,247 – 61,000
Pigs for fattening	88	13,500	33 (38%)	913 – 79,000
Bovines for fattening	74	13,500	17 (23%)	<1 – 257,000
Calves for fattening	8	13,500	3 (38%)	1,300 – 109,500
Calves for fattening (complete milk replacer)	12	25,000	8 (67%)	13,594 – 58,400
Total	**298**		**78 (27%)**	

Feed product type	No. of samples	MPL for VA (iu/kg)*	Range (iu/kg)
Milk replacers (for animals other than Calves)	6	-	23,902 - 65,400
Complete feeding stuffs (for animals other than above)	109	-	<10 - 284,500
Complementary feeding stuffs	625	-	0 - 787,000,000
Feed materials	139	-	<10 - 170,000
Additives	2	-	<200 - 65,200
Minerals	133	-	<200 - 5,273,000
Premixtures	23	-	7636 - 10,700,000
Total	**1037**		
Grand total	**1335**		

* MPLs not set for these feed types.

As can be seen from the table, most samples were found to conform to the appropriate vitamin A maximum permitted levels (where they exist). However, out of the 298 samples taken for feed types that have MPLs, 78 (27%) exceeded the relevant limit. This does not take into account uncertainties inherent in the analytical and sampling

methods, and the likelihood that some samples identified as complete feeds were in fact complementary feeds.

The levels reported for complete feeds for bovines for fattening ranged from less than 1 to 257,000 iu/kg. 17 (23%) out of the 74 samples exceeded the MPL. The local authorities concerned have been asked to follow up those products that were found to contain vitamin A in excess of the MPL.

Levels for complete calves' feeds ranged from 1300 iu/kg to 109,500 iu/kg and out of the eight samples taken, three were found to exceed the MPL. All but one of the samples of complete feeds for lambs (one at 61,000 iu/kg) were found to conform to the relevant limit.

Out of 88 samples of complete feed for pigs, 33 (38%) contained levels of vitamin A in excess of the MPL – the highest being 79,000 iu/kg. However, many of the samples containing excess vitamin A were only slightly above the MPL, and might be considered to comply once allowances for measurement uncertainty were made.

For complete feed for poultry, the range of vitamin A levels was 3,116 to 133,9000 iu/kg. Of the 107 samples analysed, 16 (15%) were reported as exceeding the MPL. Twelve samples of milk replacers for calves were taken and eight of these exceeded the MPL with levels ranging from 13,594 to 58,400 iu/kg. However, seven of these eight samples exceed the limit by a comparatively small margin. Local authorities have been asked to take appropriate follow up action.

Additives and premixtures do not have MPLs, as they are normally added to feed material at up to 5% in complete feeds. In additive preparations, vitamin A levels ranged from less than 200 to 65,200 iu/kg. In premixture preparations, levels ranged from 7,636 to 10,700,000 iu/kg. The range reported for mineral products was less than 100 to 5,273,000 iu/kg – it is perhaps surprising that some of these products should contain comparatively high levels of vitamin A.

Currently, there are no maximum limits for complementary feedingstuffs. 625 samples were taken – the vitamin A levels ranged from a reported level of 0 to 787,000,000 iu/kg. The latter is very high and might possibly represent a reporting error (e.g. the sample was in fact a vitamin A-containing premixture). The next highest level for vitamin A reported in a complementary feed was 3,000,000 iu/kg.

In some cases manufacturers add an extra amount of vitamin A (known as 'overage') to their feed products. This is done because they believe that the substance is not completely stable and that the extra amount ensures that there is sufficient vitamin A present in the product when bought and used to comply with the labelling declaration.

Even allowing for measurement uncertainty and possible erroneous classification of some complementary feeds as complete feeds (i.e. supplying a total daily ration), clearly a number of samples was found to contain levels of vitamin A in excess of the maximum permitted levels. This might have implications for both animal welfare and human health if excessive amounts of this vitamin are passed on to the meat, offal, eggs

etc.. The Scientific Advisory Committee on Nutrition (SACN) is assessing possible effects of high intakes of vitamin A for consumers; part of this assessment includes the contribution from animal-derived produce (e.g. calf liver).

Annex

Glossary of terms used to describe feed products in the summary report for vitamin A

complete feed: a product that, together with water, will provide all the normal dietary requirements for the growth and maintenance of healthy animals, fish etc.. These are normally manufactured from a blend of feed materials, together with additives, such as trace elements and vitamins.

complementary feed: (sometimes called supplementary feed): a product that provides additional feed components to the animal. For example, grazing animals may be given a complementary feed to add protein and essential trace elements to the diet that are not available in sufficient quantity in their pasture.

compound feed: a mixed feed product containing at least two feed materials. This term includes complete and complementary feeds.

feed material: (sometimes called ‘straights’) a single commodity or substance used in animal nutrition (e.g. maize starch, wheat or calcium carbonate). Feed materials are sometimes fed straight to livestock, or incorporated as ingredients into compound feeds.

feed additive: a substance, other than a feed material, veterinary medicine or processing aid, added to feed for nutritional purposes, to perform a technological function, maintain a healthy environment, or to help enhance growth.

premixture: one or more additives mixed in with substances used as carriers, intended for the manufacture of compound feedingstuffs.