IRRADIATION OF DRY CAT FOOD
THE FACTS

Executive summary

1. Irradiation processes are used to eliminate micro-organisms and contamination from a wide range of pet products in order to make these products safer for animals and to eliminate biosecurity risks to the environment.
2. While irradiation at appropriate levels has proved a safe option for treating commercial pet food, there is credible evidence that very high dose gamma-irradiation of dry cat food can lead to health problems in cats, specifically an increase in the incidence of neurological defects.
3. The way in which high dose irradiation causes this effect in cats is still under investigation, but the syndrome is similar to that also reported to occur spontaneously.
4. There have been no reports of neurological problems in any other species that have been studied – such as rodents, dogs and monkeys – associated with feeding irradiated diet over many generations to keep the animals pathogen-free.
5. As Australian and international regulatory authorities have established, for many food products irradiation up to 10 kiloGray (kGy) does not present a food safety risk.
6. In late 2008 and early 2009 in Australia, domestic cats developed problems after three shipments of commerical cat food imported by Champion Petfoods of Canada were irradiated to a minimum dose of 50 kGy[1]. Irradiation was required by Australian quarantine officials due to the failure of the supplier to provide evidence that the manufacture of the dry cat food had met Australian quarantine import requirements.
7. The decision to irradiate was taken by the pet food manufacturer and importer and under the advice of Australian quarantine authorities. The manufacturer and importer retain responsibility for the quality of their product and any effect that irradiation might have on it. The contracted irradiator, in this case Steritech, provided a dose at a level requested by the product owner who retained responsibility for final product quality.
8. In response to the problem with the shipments of Champion Petfoods's product, the Australian Government no longer permits the irradiation of cat food. This is the only known ban on the irradiation of pet food in the world.
9. The neurological damage induced by irradiated pet food may be specific to cats, a suggestion also made by the Australian Veterinary Association and Food Standards Australia New Zealand (FSANZ).
10. The European Food Safety Authority is investigating the irradiation of cat food and will review the impact, if any, on the general safety of irradiated food. FSANZ will also continue to monitor any developments related to the irradiation of pet food and the safety of irradiated food for human consumption.

What is the issue?

11. Between 2007 and 2009, four scientific studies reported that high dose gamma-irradiation of dry cat food can lead to an increase in the incidence of neurological defects and clinical disease in cats fed the diet. Three of the studies involved laboratory-bred cats fed the diet exclusively. The other was based on Australian experience of domestic cats fed on an imported irradiated cat food, in some cases exclusively, in some cases not.
12. The syndrome includes an inability to coordinate and regulate hind limb movement. The syndrome is similar to a spontaneous syndrome reported in the literature in many species of the cat family.
13. The way in which irradiation causes its effects are uncertain, though some suggestions have been made.

Why was dry cat food irradiated in Australia?

14. Irradiation processes are commonly used to eliminate micro-organisms and contamination from a wide range of pet products in order to make these products safer for animals and to eliminate biosecurity risks to the environment.
15. The Australian Quarantine and Inspection Service (AQIS) posted a Notice to Industry on 23 December 2008 about the Safety of Imported Pet Foods at which time the evidence on irradiation effects with dry cat food was still developing.
16. Pet food must comply with Australia's import conditions before an import permit is issued by AQIS to an importer.
17. Where imported pet food has not undergone moist heat treatment to achieve a minimum core temperature of 100°C for at least 30 minutes or equivalent during the manufacturing process, AQIS offers importers the options of subjecting the pet food to moist heat treatment or irradiation, as a condition of import.
18. Importers are advised by AQIS to consult with the irradiation provider and inform themselves about the possible effects of irradiation treatment on their particular product prior to electing to undertake such treatment.
19. In Australia, domestic cats developed problems after shipments of an imported cat food (Orijen from Champion Petfoods of Canada) were irradiated in Australia to a minimum dose of 50 kGy as required by AQIS.

[1] A kGy (kiloGray) is a unit of irradiation dose. 1 kGy = 1000 Gy. 1 Gy is 1 Joule of energy deposited in each kg of irradiated material.

20. Irradiation of three shipments occurred before the importation was stopped when attention was drawn to the development of disease in some cats.

21. The exposure of the Orijen brand of pet food to high dose irradiation resulted in multiple cats becoming sick and some deaths in 2009, which caused understandable distress to their owners. Champion Petfoods undertook a recall of the product and established a compensation fund for the reimbursement of related veterinary and medical expenses.

22. Irradiation was a condition of importation imposed by Australian quarantine officials due to the failure of the supplier to provide evidence that the manufacture of the dry cat food had met Australian quarantine import requirements. The irradiation dose imposed was the standard dose for all materials that could harbour pathogens that were potentially harmful to Australian primary industry.

23. Following discussions between the suppliers and AQIS, a decision was taken to irradiate the pet food after import. Steritech was contracted to carry out the treatment. As made clear by AQIS, it is ultimately the responsibility of pet food manufacturers and importers to determine if irradiation of pet food could be a risk to pet health. Irradiation are carried out on the basis of a contract to provide an agreed dose, with the responsibility for the effect on the treated product remaining the responsibility of its owner. In Australia, domestic cats developed problems after shipments of an imported cat food (Orijen from Champion Petfoods of Canada) were irradiated in Australia to a minimum dose of 50 kGy as required by AQIS.

What type of cat populations have been affected?

24. Affected cats in Australia and overseas have included males, females, pregnant females and a wide range of ages.

25. Three of the studies were of cats held in laboratory breeding facilities. Such cats are often kept free of harmful pathogens (such as bacteria and viruses); this helps the overall health and management of the colony and may be required for veterinary or related research. Normal cat food can harbour pathogens and the food is treated to kill these harmful agents. Heat pasteurization can be used as a treatment, but irradiation at doses between 25 and 50 kGy is more effective and often used for the diet of many laboratory animal species.

Other animal food and species?

26. There have been no reports of neurological problems in any other species associated with feeding irradiated food. This includes generations of other laboratory species such as mice, rats, dogs and monkeys routinely fed the irradiated food appropriate for their species. The health of these laboratory animals is closely monitored.

27. The US Food and Drug Administration (FDA) permits the irradiation of animal feed and pet food, with a dose limit of 50 kGy. The FDA also requires that the feed is formulated to account for nutritional loss, a requirement not imposed in Australia.

28. A major trial of the safety of irradiated food involved chicken meat irradiated to 58 kGy and fed to several species (not cats), which were then observed for a wide spectrum of adverse health effects. Many other irradiated foods, usually treated with lower doses, have been intensively tested for toxicity in animal trials. Irradiated food has also been fed to human volunteers. The data have been evaluated by many international scientific committees; the overwhelming consensus is that food irradiated up to 10 kGy is safe. This dose limit does not imply that food irradiated at higher doses is necessarily unsafe.

29. Changes in the composition of dry animal food are very dependent on the exact composition of the product and irradiation conditions. Most nutrients and micronutrients are not, or only slightly, altered. The most relevant nutrient change found for cat food was a reduction in vitamin A. The reduction of this vitamin is greater than in dog and rodent food. Peroxide, a non-nutrient, is produced by irradiation in similar amounts in the three pet foods. The changes in composition of the three pet foods seem insufficiently different to account for major neurological damage being found only in cats.

30. It appears that the neurological damage induced by irradiated food may be specific to cats, a suggestion put forward by the Australian Veterinary Association, FSANZ and some of the scientists involved in the cat studies.

Official responses

31. The Australian ban on irradiation of imported cat food is the only known ban on irradiation of cat food. The USFDA has not taken a similar course of action.. Given the absence of effects in other species, the long history of the safe use of irradiated pet food for non-cat species and the close monitoring of the health of laboratory animals, continuing use of irradiated food for other species seems likely.

32. FSANZ has issued a joint statement with the Australian Veterinary Association and Biosecurity Australia agreeing there is evidence from the laboratory cat studies for development of a neurological syndrome in cats exclusively fed an irradiated diet. The syndrome is believed to be cat specific.

33. The European Food Safety Authority is investigating, as part of a wide ranging look into the safety of irradiated food, the cat food findings to review its impact, if any, on the general safety of irradiated food. To date, the European Commission and its scientific committees have always found in favour of the safety of food irradiation.

Public perception

34. Shortly after the Australian and US studies became public, anti-food irradiation groups made a number of negative, and often incorrect, comments on the matter, particularly online.

35. The cat owners also had intense discussions on their online forums regarding the Orijen product and irradiation. Orijen openly contributed to these forums and laid the blame squarely at the AQIS requirements. The often quoted line “there has been no other issue in any other country with this product” was made by the Champion Pet Foods.

36. There has been negative publicity for Steritech over its role in the cat food irradiation. However, the decision to irradiate was taken by the owners of the pet food after discussions with AQIS. Steritech undertook a contract to irradiate the cat food, but the responsibility

for any effect on the quality of the treated product falls to the owner requesting treatment, not the irradiator.

37. Anti-irradiation groups have sought to link the issue to the safety of irradiated food for human consumption despite major difference in the products in question and in the levels of treatment between the pet food in question and food for human consumption. Whether there is much awareness among the general public, even in Australia, is doubtful and there has been no discernible impact on trade of irradiated herbs, spices and fruit for human consumption.

38. The issue is sure to be raised in objections that anti-food irradiation groups will make to any applications to FSANZ to widen the permitted uses of irradiation. The objection can be countered by pointing out:

    - the difference in irradiation dose for cat food (50 kGy minimum)and fresh produce (1 kGy maximum).
    - the evidence from intensive animal testing and scientific opinion on the safety of irradiated foods for human consumption.
    - the evidence of species-specificity for irradiation food-induced neurological effects in cats and the well documented prevalence of spontaneous similar effects in cats with vitamin deficiency.
    - that the irradiated food was a high percentage (100% in three of four studies) of total cat food and irradiated food is only likely to ever be a small part of the human diet.
    - that FSANZ will continue to monitor any new evidence and is committed to reviewing any applications for food irradiation on a case-by-case basis in order to examine any special cases of nutritional deficits or toxic effects.

Conclusion

39. Irradiation has proved a safe option for treating a range of food products, including commercial pet food. However, there is credible evidence very high dose gamma-irradiation of dry cat food can lead to health problems in cats, specifically an increase in the incidence of neurological defects. For example, a number of domestic cats in Australia developed heatlh issues after consuming imported cat food in late 2008 and early 2009 that had been irradiated at very high levels at the request of Australian quarantine authorities and with the approval of the manufacturer. The way in which high dose irradiation causes these issues in cats is still under investigation, but the syndrome is similar to that also reported to occur spontaneously in the species. The effects found in cats have not been reported in other animal species.

40. The irradiation process is very effective in eliminating pests and bacteria in food and can be a powerful tool in managing biosecurity risks. The technology has been successfully applied to food products, including commercial pet food, in many countries around the world. There are issues with high dose irradiation of pet food and its impact on cats, especially when the cat does not receive a mixed diet. Nonetheles, this does not mean the process is unsafe, but rather Steritech believes irradiation technology can broadly and safely be applied to pet food as long as specific management processes (such as only utilising low dose irradiation) are implemented, especially in relation to cat food while more research can be undertaken.

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