

Disposal of contaminated pork

1. Summary:

The EPA recommends disposal by rendering of contaminated pork goods in the commercial chain.

2. Introduction:

During the weekend of 6th December 2008 it was discovered that some pork products produced in Ireland were contaminated with dioxin-like polychlorinated biphenyls (PCBs). A government ban on the sale and consumption of all Irish pork products has been called until further notice. Pork in the retail chain has been taken off the shelf, while that in the production chain is subject to an embargo. All such meat is to be disposed of in an environmentally acceptable manner. This guidance from the EPA gives information on disposal options acceptable to the EPA to ensure that there is not an impact on the environment or on public health.

3. Recommendations:

- 3.1 Householders should place any pork goods purchased between September 1st 2008 and Monday 8th December 2008 in their black bin and send it for disposal in the normal manner.
- 3.2 Contaminated pork goods in the retail system should be returned to the processor of origin.
- 3.3 All contaminated pork goods being held by processors should be sent for rendering at one of the four facilities licensed by the EPA, and permitted by DAFF, to process Category 1 material.
- 3.4 Contaminated pork goods should only be landfilled in those limited circumstances where the options to render or incinerate the affected material are not available, and only with the specific approval of the Agency and DAFF.
- 3.5 Meat & bone meal produced during the rendering of the affected meat goods should only be disposed of by incineration or by combustion in a WID¹ compliant process.
- 3.6 Tallow oil produced during the rendering of the affected meat should only be used as boiler fuel on the site of the rendering facility where it is produced and only where the boiler operating parameters for temperature

¹ Waste Incineration Directive (2000/76/EC)

satisfy the requirements of Annex IV of EC Regulation² 1774/2002, i.e., the boiler operates reliably at a temperature in excess of 850°C.

- 3.7 Tallow oil removed from the site of the rendering facility where it was produced should not be used as boiler fuel at any other facility. Such tallow oil should only be disposed of by incineration or by combustion in a WID compliant facility.
- 3.8 Waste water treatment plant sludges produced in rendering facilities which process the affected meat should be monitored for the presence of PCB contaminants, and should only be landspread where there is no risk of exceeding safe levels of dioxin-like PCBs in soil.
- 3.9 Treated effluent from the waste water treatment plant of any rendering facility used to process the affected meat should be monitored to ensure that discharges do not cause pollution of the receiving environment.
- 3.10 Where Thermal Oxidiser abatement units are used to treat off-gasses from the cooker in rendering facilities used to disposed of the affected meat, these units should be operated at >850°C.

4. Household pork goods:

The Government notification issued over the weekend (6th December 2008) recommended that consumers should either take their pork groceries back to the place they were purchased and seek a refund or simply dispose of these items like ordinary household refuse. It is likely that many householders will indeed place the rejected pork items in the black bin and send it for landfill disposal in the normal way. This type of material will likely be effectively diffused throughout other normal household waste materials and is unlikely to present an environmental problem upon being landfilled.

5. Pork goods in the commercial chain and on farms:

It is likely that significant quantities of unsold pork will arise in the retail system, in the distribution system and at the processor facilities, which will need to be disposed of so as to minimise the potential risks to the environment. It is thought that about 14,000 tonnes of this type of material in the processor-to-retail chain may need to be managed. Approximately 10,000 standing pigs still on the farms may also need to be destroyed and the resultant meat disposed of.

² REGULATION (EC) No 1774/2002 of THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 3 October 2002 laying down health rules concerning animal by-products not intended for human consumption (OJ L 273, 10.10.2002, p. 1)

5.1 Options available for disposal of material in the commercial chain:

It is noted that the concentration of PCB in the affected meat produce has been determined through analysis to be approximately 200 pg/g or less³. According to EC Regulation No. 1881/2006⁴ the safe level for PCB in pig flesh is 1 pg/g and the safe level for PCB in pig fat is 1.5 pg/g. The risk to the environment generally from this material is not as high as the risk posed from direct consumption. The Persistent Organic Pollutants Regulation (covering a family of pollutants including PCBs) requires that waste contaminated with >50mg/kg of PCB must be disposed of without undue delay such as to ensure that it is destroyed or irreversibly transformed. Below this level no specified route for the disposal or recovery of the waste has been set out in the Regulation. Therefore, given that the affected material to be dealt with contains levels of PCB significantly less than what is specified in the regulation for special disposal, it is a precautionary approach that is being recommended in order to minimise as far as possible any residual risks that might be presented to the environment.

The following possible options for the disposal were considered:

- Incineration,
- Rendering, or
- Landfilling.

5.1.1 Incineration:

PCB contaminated meat could be safely disposed of through incineration. No relevant residues that could pose a threat to the environment would be anticipated from this disposal option.

There is no incinerator on the island of Ireland at present that could handle the type and quantity of material needing disposal in this case. Export of the material to the UK or other neighbouring countries was regarded to be impractical and the associated costs were deemed to be not economically viable having regard to the availability of other acceptable disposal options.

5.1.2 Rendering:

PCB contaminated meat could be treated through rendering. The material to be dealt with has been classified by the Department of Agriculture, Fisheries and Food (DAFF) (8th December 2008) as Category 1 under the Animal By-products Regulations. Therefore the material would have to be handled by one (or more) of the four rendering facilities licensed by the EPA and permitted by DAFF to handle Category 1 material. These facilities are:

³ pg/g = picogram per gram (1 picogram = 1×10^{-12} gram)

⁴ COMMISSION REGULATION (EC) No 1881/2006 of 19 December 2006 setting maximum levels for certain contaminants in foodstuffs

College Proteins
Premier Proteins
Dublin Products
Waterford Proteins

Two main types of material are likely to be presented for disposal:

- Bulk items (unpackaged and carcasses)
- Packaged consumer ready pieces of pork product

Bulky pork items and previously unwrapped items could go directly into the rendering plants reception silos for processing.

Various branded pork items with their packages still attached and which have been recalled from the retail chain are likely to be amalgamated before being sent for disposal. The disposal option chosen will have a bearing on whether the items to be disposed of will need to be unpackaged or whether they can be sent to the selected disposal route with packaging attached.

Consideration needs to be given by DAFF and the pig processing sector to the logistical arrangements for the movement and storage of the contaminated meat prior to its reception into the rendering facilities.

5.1.3 Landfilling:

PCB contaminated meat could be treated through landfilling. The landfill would have to be to a very high technical and environmental standard to ensure that no contamination of the surrounding environment would arise. However, given that the waste material (contaminated pork) is classified as Category 1 under the Animal By-

products legislation, the option to landfill is not favoured and could only be selected where the options to render or incinerate the material are not available. Any landfill selected to accept this type of waste must have an appropriate licence from the EPA and must be specifically licensed to accept this type of waste material. Approval from DAFF for such landfilling would also be required.

The risks to be managed arising from the use of these option will be discussed in the Environmental Risks & Consequences section below.

6. Environmental Risks & Consequences

The movement of unpackaged meat could lead to odour problems associated with the transfer of the raw meat to an appropriate facility for processing. Precautions would have to be taken to ensure that the material is moved in sealed containers.

6.1 Incineration:

Incineration of the contaminated pork has been discounted as a practical option due to the constraints of cost and logistics. Therefore the environmental risks and consequences of this option need no further consideration at this stage.

6.2 Rendering:

Currently EPA-licensed Category 1 rendering plants (of which there are 4 in the State) routinely handle large quantities of animal by-products from the meat-processing sector on a daily basis. These plants are well established for that purpose and operate effectively in accordance with IPPC licences.

The Federation of Irish Renderers have indicated that it is possible for that portion of the contaminated meat which is packaged to be introduced directly into the rendering process, and the need for package removal is obviated. The EPA is satisfied that this option will not pose any additional environment risk.

The PCB contaminant in the pork material to be rendered is likely to move through a number of routes during the rendering process, as follows:

Meat and Bone Meal (MBM):

Meat & Bone meal from the rendering of PCB contaminated pork is likely to be contaminated with the original PCB compound. The PCB is resistant to heating and is unlikely to be denatured or significantly volatilised by the heat of the cooking process (up to about 132°C), and so will retain its original form. MBM from the cooking process will therefore be contaminated and will need to be further treated. In the Irish context the material could be safely used as an auxiliary fuel in a cement kiln. Only one cement kiln in the State is licensed to treat Category 1 MBM in this way. This kiln, at Lagan Cement in Kinnegad is WID⁵ compliant and is regarded as a good practicable environmental option in this case for the safe disposal of meat & bone meal arising from the rendering of the contaminated pork.

If the meat & bone meal produced is found to be unsuitable (for example, due to its handling characteristics) for introduction to a WID compliant combustion process in the State, then it will have to be exported for incineration.

⁵ WID: Waste Incineration Directive (2000/76/EC)

Tallow Oil:

PCBs are known to be lipophilic (i.e., fat loving), and will tend to stay with the lipid fractions expelled from the MBM during the rendering. For this reason it is expected that the tallow separated from the rendered material (MBM) will contain a significant proportion of the contaminants. Such tallow oil as may be produced should be dealt with in one of the following ways:

(i) Use as boiler fuel at the rendering facility where it is produced:

Tallow oil is a valuable fuel. In the case of tallow oil produced through the rendering of contaminated pork materials in this case, it is expected that the oil may be contaminated to some extent with dioxin like PCBs. This tallow oil could be utilised as a boiler fuel where it can be demonstrated that the boiler operation will be such as to destroy any possible contaminant present. Burning at temperatures in excess of 850°C is regarded as a safe method to destroy such contaminants.

Where it can be demonstrated that the boiler at the rendering facility where the oil is produced can reliably perform to an operating temperature in excess of 850°C, the tallow oil should be utilised as a boiler fuel at that site. Such tallow oil should not be transferred to any other facility for use as a boiler fuel.

(ii) Incineration or combustion in a licensed WID compliant facility:

The tallow oil produced from the rendering of the contaminated pork products could be safely disposed of through incineration or through a WID compliant combustion process. Use of this tallow as an alternative fuel in any facility other than the rendering facility where the oil was produced or in a WID compliant facility should be prohibited in order that the potential PCB contamination is prevented from being emitted into the atmosphere and the wider environment. The DAFF could make an order in this regard. The Agency will notify all users of normal uncontaminated tallow oil as boiler fuel of the appropriate restriction in relation to the tallow oil produced from the contaminated material in this case.

Off Gasses from the cooker:

It is anticipated that a significant proportion of the PCB element of the rendered material will be retained in the MBM and in the tallow oil. Some traces of contaminant may be driven out in the off-gasses but this is expected to be a relatively small amount. The Category 1 rendering plants to which the material is likely to be sent all employ

Thermal Oxidiser (TO) technology to treat off gasses and where the TO in each case is run at $>850^{\circ}\text{C}$ any residual traces of PCB would be effectively destroyed before escaping to the atmosphere. Careful control of TO operation would be required to ensure that no escape of contaminant could occur.

Waste Water Treatment Plant (WWTP):

Washdown water from the reception area at the rendering facility could lead to contamination of effluent going to the WWTP, although this may be at a relatively low level. PCB is not hydrophilic (i.e., water loving) and is unlikely to separate from the contaminated meat under the influence of water runoff. However, WWTP sludge should be recycled to the cooker in batches for further rendering. The sludge generated should be monitored on an ongoing basis to determine if PCB is mobilised through that route. If the sludge is found to be clear of PCB contamination then it could be disposed of in the normal way. If PCB contaminant were found in the WWTP sludge then it would need to be disposed of in an environmentally acceptable manner. The Persistent Organic Pollutants Regulation (covering a family of pollutants including PCBs) requires that waste contaminated with $>50\text{mg/kg}$ of PCB shall be disposed of without undue delay such as to ensure that it is destroyed or irreversibly transformed. Below this level no specified route for the disposal or recovery of the waste has been set out in the Regulation. It is not expected that the level of PCB residue in the wastewater treatment plant sludge will be above this threshold figure, but appropriate monitoring could be employed to ensure that this is the case. A Dutch Intervention value of 1 mg/kg applies for PCB in soil and a target value of 0.02 mg/kg is also suggested for soil. It is anticipated that the concentration in soil after the application of the WWTP sludge in this case would be significantly below these threshold values. As mentioned, monitoring of the levels of PCB in the WWTP sludge could be carried out on sludges before it is cleared for landspreading.

Wastewater should be monitored for the presence of PCB in order to protect the aquatic environment. Treated effluent from the waste water treatment plant of any rendering facility used to process the affected meat should be monitored to ensure that discharges do not cause the levels in the receiving water to be raised.

6.3 *Landfilling:*

Landfilling of large quantities of this type of material would present a number of challenges, which would need to be planned for, and managed carefully if the option was to be used. Given that the waste material (contaminated pork) is classified as Category 1 under the Animal By-products legislation, the option to landfill is not favoured and could only be selected where the options to render or incinerate the material are not available. Any landfill selected to

accept this type of waste must have an appropriate licence from the EPA and must be specifically licensed to accept this type of waste material. Approval from DAFF for such landfilling would also be required.

Volume arising:

The quantity of contaminated pork arising for disposal is thought to be approximately 14,000 tonnes in the processor-to-retailer system, and approximately 10,000 standing animals that have to be destroyed and that meat disposed of. Any individual landfill site chosen to receive such material would ideally need to have dedicated cells for this contaminated material and would need to have facilities which would allow for the segregated collection of leachate.

Odours:

The placing of a large quantity of putrescible waste (meat) in a dedicated waste landfill cell would lead to eventual biological degradation of the placed material. This could give rise in the short, medium and long term to odour problems that could be difficult to manage. Therefore only a landfill site (or sites) which is located and operated so as to protect the public from offensive odour nuisance could be selected. The EPA would therefore only give permission for disposal at landfill on a case-by-case basis and where disposal by rendering was regarded not to be a viable option.

Leachate:

The level of PCB that would arise in the collected leachate will depend on the concentration of PCB in the affected meat. If the concentration arising is very low it may be possible to deal with this leachate in the normal way, if high - then it may be necessary to treat the leachate by incineration to ensure protection of the environment from PCB contamination.

If the leachate were found to be heavily contaminated with PCB the volume of leachate for incineration would be significant. If the resultant concentration of PCB in the leachate required that it had to be disposed of by incineration it should be noted that there is no incinerator available on the island of Ireland at present that could treat such leachate so the material would have to be exported. This would give rise to significant cost and logistics implications.