

Preliminary and incomplete notes on the safe handling, transport and storage of MBM and other bovine derived materials which may be contaminated with the BSE agent or other pathogens - Draft for comments compiled by the Scientific Steering Committee at its meeting of 25-26 May 2000

Text subject to further changes

THIS DRAFT IS STILL INCOMPLETE AND SUBJECT TO CHANGES. SEVERAL ASPECTS ARE NOT YET BEING ADDRESSED OR ARE FLAGGED WITH QUESTIONMARKS.

IN ORDER TO PREPARE AN AS GOOD SERIES OF NOTES AS POSSIBLE, THE SSC IS INVITING THE PUBLIC TO COMMENT AND SUGGEST AMENDEMENTS.

They can be sent to (UNTIL 28 JULY2000):

paul.vossen@ec.europa.eu

BACKGROUND

In its previous opinions, the SSC has addressed the problem of excluding specific risk materials from entering the food chain directly and the safe disposal of possibly contaminated material. The SSC has not previously given an opinion on safe handling, storage and transport of possibly TSE contaminated material that is destined for disposal.

Safe storage of pathogenic or potentially pathogenic material is an essential element in the protection of animal and human health, and of the environment. It can become of major importance if a large number of animals are required to be slaughtered over a short period of time in order to control an epidemic, and there is inadequate capacity for immediate safe processing and/or disposal. This has been the situation with the BSE epidemic. Rendering in steam for 20 minutes at 133 °C at a pressure of 3 bars has been identified as a very important step in reducing the risk substantially from BSE contaminated material. However, because MBM produced in the UK is no longer fed to any species of farmed animal, the UK renderers have opted not to change to the steam-under-pressure system, and continue to use the more traditional but less inactivating rendering processes. Depending on the capacity of the countries' rendering plants to manage the sudden increase in demand, an accumulation of animal tissues and/or of rendered material may occur prior to disposal by approved safe routes. In the case of BSE, the great majority of stored material for disposal comprises meat and bone meal and to a much lesser extent, tallow. It has been the case in some countries that the quantity of material requiring safe disposal, as a consequence of the BSE epidemic, has overwhelmed the storage capacity set aside to deal with potentially pathogenic/toxic material. This has identified the need for guidelines of what should be the minimum criteria for safe storage and safe disposal in an emergency situation in order to protect the workforce (ie: those involved in handling the potentially contaminated material), the general public and the environment.

Some countries, such as Switzerland, have elected to combust all additional potentially suspect material in power stations and have consequently minimised the requirements for storage capacity. However, the SSC has not recommended this method of disposal to Member States because of the lack of evidence available to the Committee to demonstrate its suitability. Other countries, for example the UK, have been more restrictive in the approval of disposal methods and as a consequence have had to find suitable storage capacity for large quantities of meat and bone meal and tallow.

The purpose of this opinion is to identify criteria for the safe storage and transport of meat and bone meal and of carcasses prior to rendering. It does not address the risk to abattoir workers involved in stunning, killing, collecting blood and carcass preparation from food animals. There have been several highly publicised incidents in which stored MBM material has either caught fire or has been shown to have not been contained effectively within the designated storage area.. There is also evidence of poor storage conditions resulting in MBM setting like concrete, resulting in subsequent difficulties in disposal.

There are three important requisites to minimise the risk associated with storage of possible pathogenic materials:

- A. well contained storage conditions;
- B. high standards of cleanliness
- C. good worker protection.

A. WELL CONTAINED STORAGE CONDITIONS

A.1. SAFE STORAGE OF MBM

For worker protection, the principal factors are to minimise dermal contact with the MBM and keep dust levels very low to avoid contact with the eyes and respiratory system. When first produced MBM does not readily produce dust because of its relatively high fat content . However, after long-term storage it may set in large blocks which require to be broken up. This has the potential to produced airborne particulate matter.

The requirement in terms of protection of the public and the environment should be considered in the light of the magnitude of the potential risks from poor control over access to or containment of potentially contaminated MBM. The following aspects need to be assessed:

- risk from access by animals, birds or insects which may result in transfer of MBM outside the store, or in the case of some animal species, possible risk of TSE.

The actual risk of rodents (at least mice) acquiring BSE from consuming potentially BSE-infected MBM appears to be remote. Even in studies where two strains of mice were fed BSE-infected bovine brain material, only one of these developed a TSE after the consumption (on average) of 9g of infected bovine brain (Barlow and Middleton, 1990)

- risk through access by young children, vandals, etc. which could lead to escape of MBM and/or the risk of CJD.

[risk estimate - Anderson et al (reference) have provided estimates of the number/ratio of probably BSE-infected carcasses that were unwittingly processed to provide food for humans in the UK. Perhaps these data could be used to provide a worst-case scenario as to how much BSE infectivity could be present in MBM.]

Contamination of water courses due to poor containment of water used for cleaning storage areas, vehicles, etc. *[UK risk estimate could be used]*

- Microbial growth in the MBM, for example Salmonella (NB: odour problems may also arise). *[risk estimate - concern is obviously not BSE per se]*

- Risks from dust generation to both reduce workers through MBM inhalation and potential for escape through doors, etc. (NB: This is also very important to minimise fire and explosion risk). *[Risk estimate done in certain member states?]*

- Risk of fire through failure to control "core " temperature of stored MBM, which may result in widespread dispersal of contaminated material, formation of toxic products and an unpleasant odour.

Control of these risks requires:

- i. good containment of the MBM in a fully enclosed store which excludes water ingress and egress of airborne MBM;
- ii. a well managed secure facility to ensure that:
 - access is limited to those who need to be there;
 - all those entering the premises are well versed in the health and safety requirements;
 - the MBM is turned regularly to reduce the likelihood of solidification and the build up of temperature;
 - the premises are well maintained and animal, bird and insect entry is prevented.

The SSC notes with concern that in France (*What about the situation in other Member States?*) there are presently three sites in the open air containing a total of 10,000 Tonnes of MBM. The French Authorities have indicated that measures have been taken as far as possible to avoid run-off and seepage after heavy rainfall. The risk of fire in MBM stores is illustrated by the experience of auto-combustion with the release of smoke without flames at two major sites in Brittany during 1999. In the UK a fire occurred too, in Preston in 19**[?] (*Experience in other Member States?*)

A.2 SAFE STORAGE OF CARCASSES

(Advice required)

A.3 SAFE STORAGE OF OTHER SPECIFIED RISK MATERIALS

(Advice required)

B. STANDARD OF CLEANLINESS (Based on UK regulations)

[risk from poor hygiene?]

i. Day-to-day Practice

Special arrangements should be in force for handling and transporting specific risk materials (SRM) from cattle for disposal, to ensure both worker protection and appropriate storage and disposal to avoid the material from entering food and feed chains. The material should be stained to distinguish it from other products. High standards of cleanliness should be maintained by all those coming into contact with SRM including, for example, hauliers during loading and unloading the material at abattoirs and rendering plants.

The standard disinfecting process for pathogenic materials is to use sodium hypochlorite solutions containing 20,000ppm of available chlorine, the chemical disinfection of containers, vehicles, working surfaces, floors etc exposed to contamination by SRM is not practicable in the case of TSE due to the resistance of TSE agents to routine methods of disinfection. Where appropriate, hypochlorite disinfection should be applied. When it cannot, thorough cleaning by dilution with large volumes of hot water and detergent is recommended. Particles of solid material falling on to the floor or hosed out of storage bays or hoppers etc should be trapped by a sieve or filter to prevent them entering drainage systems and sent for rendering as SRM.

During MBM production and subsequent transportation or storage and any grinding before disposal, particular emphasis should be given to minimising dust generation.

Engineering controls should be employed to enclose processes and minimise handling as much as possible. Local exhaust ventilation (LEV) equipment fitted with suitable dust filters may also be of use, for example at filling and tipping points. Where LEV is used, it is essential that the captor hood is placed as close as possible to the source of any

potential dust exposure. Suitable equipment may be fixed or portable so that it can be removed for maintenance or, for example, clearing of blockages. It is also important that effective dust traps are in place to avoid the possibility of any contaminated material being released into the general environment.

Methods of loading MBM into and out of storage sites should minimise manual handling and dust generation by the use of front-end loader shovels, for example, or rubber belt elevators. Ventilated cabs fitted with suitable dust filters can provide protection against possible exposure to dusty material. When loaded, all haulage vehicles need to be tightly secured and sealed with robust covers to prevent spillage during transportation. Once in place the covers should only be loosened and removed at the destination storage or disposal point.

Effective measures that follow the principles set out above need to be in place to deal with spillages, particularly during the loading and unloading of vehicles. This process should always be conducted in a controlled area.

ii. Cleaning of storage areas once emptied

A clear work programme should be drawn up for the decontamination of individual stores which should be prepared by a suitably qualified person. A store will have its own physical characteristics, which should be taken into account when it is emptied and ready for cleansing. Potentially difficult areas to access should be noted and extra care taken here.

All storage areas should be completely emptied and thoroughly cleansed before further use. It is recommended that an industrial vacuum cleaner be used to ensure removal of all gross debris. This prevents the spread of airborne particles and is therefore preferred to brushing. Material collected in the industrial vacuum cleaner must be disposed of with particular care because of its dusty nature.

Once the loose material has been removed the entire storage area must be subject to a de-greasing type operation to remove any melted animal fats. Any wooden or porous structures in the building must be thoroughly examined to check if any melted animal fats have penetrated them. If so, these must be subject to repeated de-greasing operations to ensure that the melted animal fats have been removed. The floor, ground, walls and ceilings must be examined carefully to determine if any rendered material has penetrated them. Likewise, any drains within the stores must be opened and inspected to check for the presence of any rendered material and resealed. If so, appropriate measures must be undertaken to remove such material.

The storage areas should then be properly cleansed using appropriate cleansing or sanitising agents, disinfected and dried.

Care must be taken to ensure that no material, either in solid or liquid form, is released into the environment. Any solid material recovered during the cleansing and disinfection should be bagged in a leak-proof and sealable receptacle, the contents clearly identified, and stored in a safe place. It should be kept separated from any other material to prevent contamination and then disposed of in accordance with guidelines for handling SRMs.

Vehicles and equipment

All equipment used for handling the rendered material (prior to and during the cleansing) must be properly cleaned using appropriate cleansing or sanitising agents, disinfected and dried, *before* it is used for any other purpose. Material removed from the equipment should be handled as indicated in the preceding paragraph.

Protective clothing used whilst handling rendered material should be bagged before removal from the site and then thoroughly washed with hot water and detergent before re-use.

Any vehicle used for the carriage of the rendered material must not be used for the carriage of other material until properly cleaned out using an industrial vacuum cleaner, cleansed using appropriate cleansing or sanitising agents, disinfected and dried.

The load sheet(s) for the vehicle must be included in any cleansing and disinfection routine. Particular care should be taken to cleanse and disinfect the blower unit on the blower vehicles, the delivery pipe and the wheels. No vehicle

should be used for the transport of any other material unless it is inspected at the time of loading and found to be clean and dry.

Record-keeping

Fully detailed documentary records of the procedures undertaken to cleanse sites following the removal of the rendered material should be kept.

For vehicles, written confirmation of when and where cleansing and disinfection took place, together with the identity of the vehicle/trailer, should be obtained and the records retained.

It is recommended that the local authority and/or government agency also confirms that it is content with the standard of cleansing, which will help to inspire confidence in future potential store users and demonstrate that the site will not cause pollution or harm to human health.

C. EFFECTIVE MEASURES FOR THE PROTECTION OF WORKERS

Although much of this opinion is centred on issues relating to the storage of MBM, it should be remembered that a number of other groups of workers are required to handle SRMs and may require similar protection measures, eg:

- Incineration plants - which may destroy MBM by incineration;
- Rendering plants - which produce MBM and may use it as a fuel in the rendering process ;[?]
- Hauliers - which load and transport MBM from the renderers to, for example, storage sites.
- Abattoir workers.

To date, there have been no confirmed cases of occupational transmission of BSE and none of the cases of vCJD have any obvious occupational links with exposure to BSE (*to be confirmed/verified*). The following recommended controls are based on those introduced in the UK.

As part of their risk assessment, those managing storage facilities which are working with MBM should consider the potential routes of transmission. There is no evidence that the BSE agent can infect animals by the airborne route (*is this still correct?*) but it has been shown to infect by the oral route. Nonetheless, minimising exposure to aerosols and dusts is prudent and in keeping with the normal principles of occupational hygiene. The most likely routes of entry are by dusty material contaminating wounds and open lesions on the skin, splashing of mucous membranes (eyes and mouth) or possibly by accidental ingestion. [*Risk assessment by route*] Basic precautions which should be taken to avoid contact between MBM and human mucous membranes are: (taken from BSE (Bovine spongiform encephalopathy): Background and general occupational guidance).

- Personal contamination by splashing should be avoided by using waterproof protective clothing including gloves and face-shield when, for example, hosing out a vehicle after delivery of SRM or at the site where it is received or when carrying out maintenance work on plant. Protective clothing should be removed before entering the cab of a vehicle or doing other work and before taking meal breaks etc. Protective clothing should be kept apart from other clothing and cleaned by washing thoroughly and regularly.
- If splashed in the eyes or face, wash with running water.
- Taking steps to avoid the generation of aerosols and dusts.
- Washing hands and exposed skin before eating/drinking/smoking, taking any medication, using the telephone or going to the toilet.
- Adherence to safe working practices and take extra care to avoid or minimise the use of tools or equipment likely to

cause cuts, abrasions or puncture wounds.

- Covering existing cuts, abrasions and skin lesions on exposed skin with waterproof dressings.

- If cuts or puncture wounds occur, encourage the wound to bleed, then wash thoroughly with soap and water and cover with a waterproof dressing.

Conclusions

Acknowledgements

Literature references.

BARLOW RM, MIDDLETON DJ, 1990. Dietary transmission of Bovine Spongiform Encephalopathy. Vet. Record, **126**: 111-112.