

The mini guide to the Management of Abattoir Waste



Western Cape
Government
Environmental Affairs and
Development Planning

BETTER TOGETHER.

RedTape
Reduction

The guidelines on abattoir waste

The Guideline on the management of abattoir waste in the Western Cape was developed by the Department of Environmental Affairs and Development Planning as one of the recommendations stemming from the status quo study of abattoir waste conducted in 2015.

It is envisaged that the guideline will provide various role-players in the abattoir sector with the necessary guidance to ensure compliance with the legislation while also providing the various options available for the management of this waste type that ensures the protection of the environment and human health.

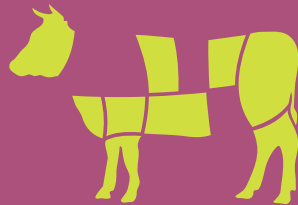
The guideline also explores the possibility of regional cooperation amongst role players as an option in resolving some of the challenges experienced in the sector.



Abattoir waste was identified through numerous reports and studies as being the most problematic food waste type to manage in the Western Cape (WC) due to the hazardous nature of the waste type and its potential impacts on the environment and human health.

1 The Status Quo of Abattoir Waste in the Western Cape

An estimated **76 102.65 tonnes** of abattoir waste was produced in the Western Cape for 2015/2016.



A total of 30% of livestock (including condemns on farms) is lost during the food supply chain.

This amounts to about **211 940.10 tonnes** of waste from an initial **787 307.20 tonnes**

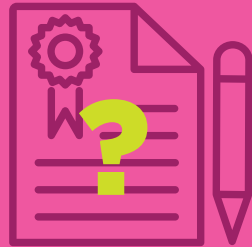


While these statistics might appear small, the methods of waste management are not ideal, as established in the study.



Waste from abattoirs are often disposed of at waste disposal facilities (WDFs) or buried on farms or private land as common practice.

Other practices include incineration, composting, rendering, and anaerobic digestion.



In some instances, the municipality's waste managers indicated that no abattoir waste was allowed on their sites for disposal. It was also evident that due to the uncertainty regarding legislation, interviewees were not willing to disclose information or the disclosure of information provided was limited.

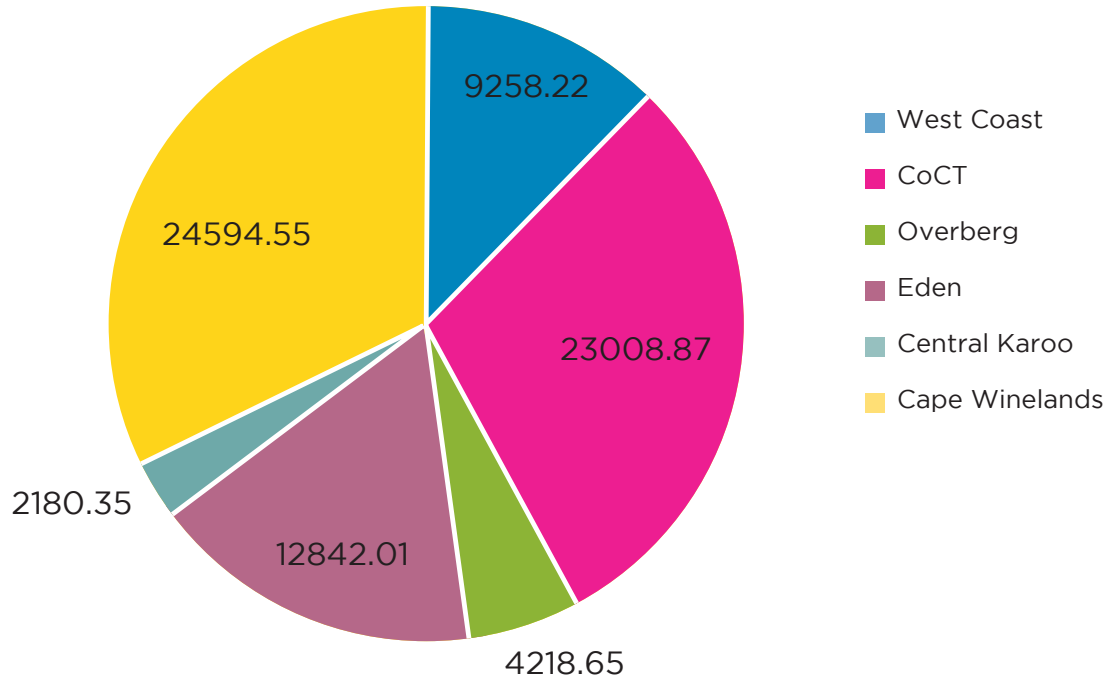
The status quo also predicts an increase in abattoir waste due to an expected increase in meat production and consumption.



The need for alternative treatment and disposal options is placing abattoir operators under additional pressure. Hence, there is a need to standardise the practice of waste management in the abattoir industry and one way would be the development of a guideline for the management of abattoir waste which was one of the recommendations of the WC status quo.

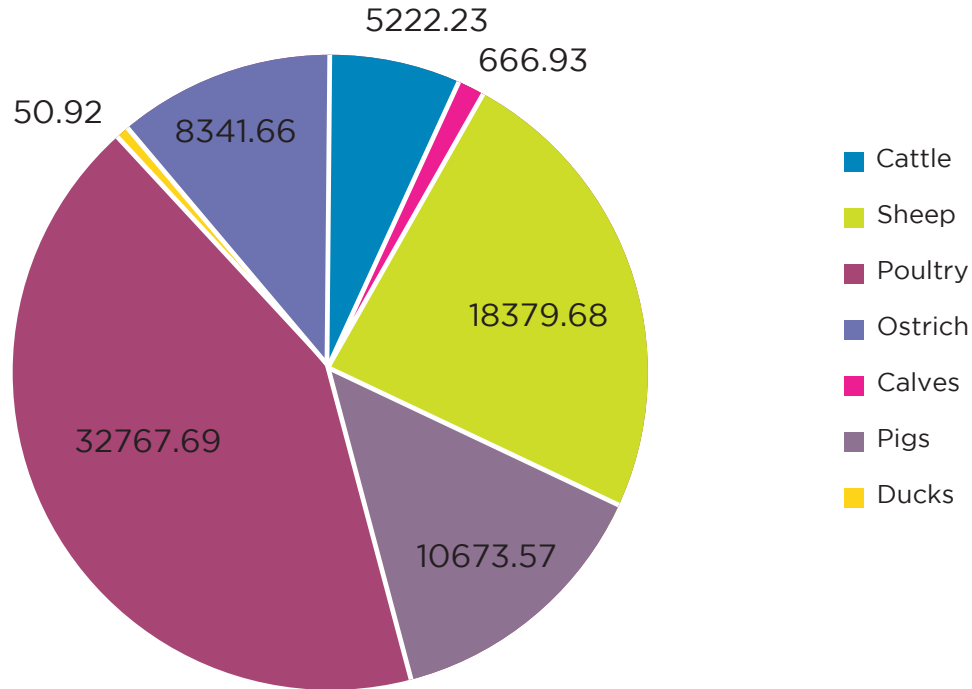
2015/16 Waste calculated from slaughters per District

Estimated waste produced for 2015/2016 per District (DOA, 2016)



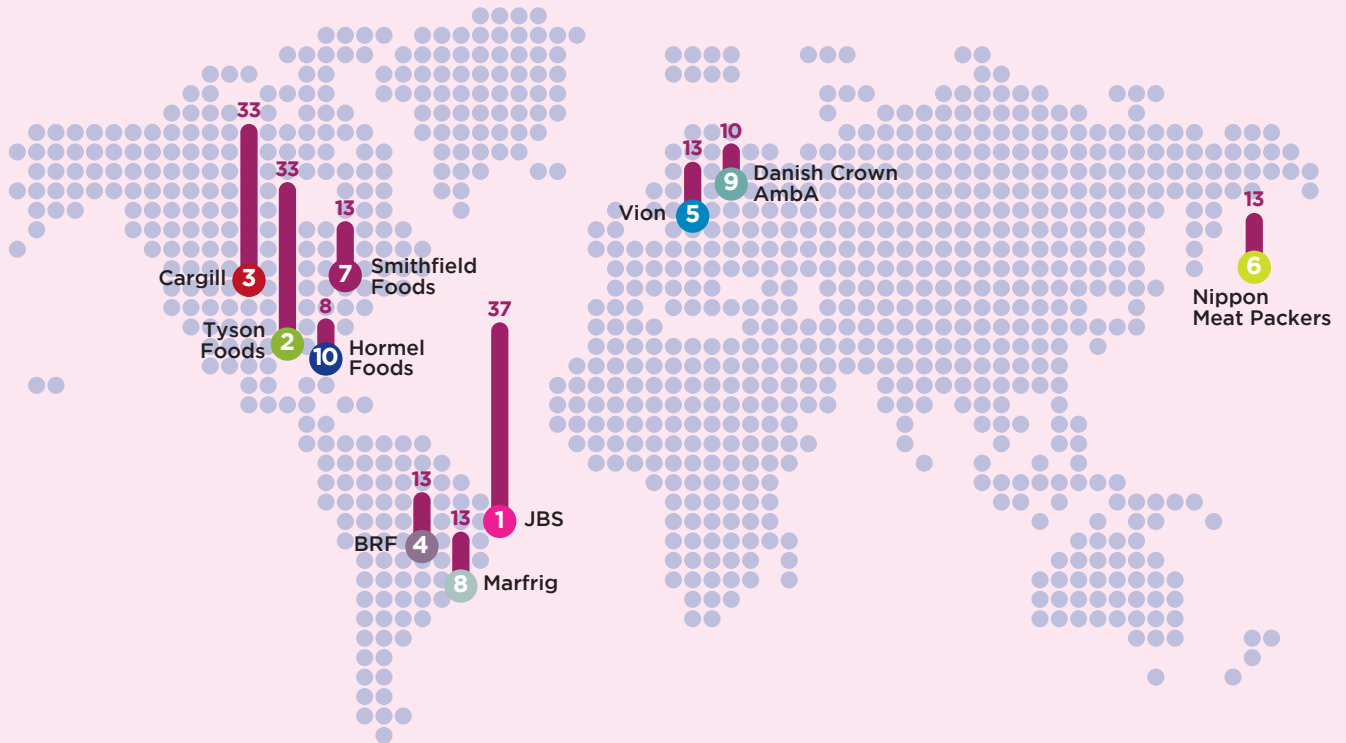
Abattoir Waste in the Western Cape 2015/16

Estimated waste produced per animal product for 2015/2016 per District (DOA, 2016)



INTERNATIONAL MANAGEMENT OF ABATTOIR WASTE

According to Meat Atlas (2014), the following are the top ten international meat industries based on revenue generated.



1 JBS

Founded in 1953. 2012 revenues: 38.7 billion dollars. World's largest food processing company, leader in slaughter capacity. Recently acquired Smithfield Foods' beef business and Marfrig's poultry and pork units.

2 TysonFood

Founded 1953. 2012 revenues: 33.3 billion dollars. World's largest meat producer and second-largest processor of chicken, beef and pork.

3 Cargill

Founded 1865, family owned business. 2013 revenues: 32.5 billion dollars. 22 percent share in the US meat market, biggest single exporter in Argentina, worldwide operations.

4 BRF

Founded in 2009 as Brazil Foods after a merger of Sadia and Perdigao. 2012 revenues: 14.9 billion dollars. 60 plants in Brazil, present in 110 countries.

5 Vion

Founded in 2003 after several mergers. 2011 revenues: 13.2 billion dollars. Largest meat processor in Europe, rapid growth (2002: 1 billion dollars).

6 Nippon Meat Packers

Founded in 1949. 2013 revenues: 12.8 billion dollars. Commonly known as Nippon Ham. Operations in 59 locations in 12 countries, mostly in Asia and Australia.

7 Smithfield Foods

Founded in 1936. 2012 revenues: 13.1 billion dollars. Largest pork producer and processor in the USA. Sold to Chinese Shanghai International Holdings Ltd., with revenue of 6.2 billion dollars in 2013.

8 Marfrig

Founded in 2000 after several mergers. 2012 revenues: 12.8 billion dollars. Company units in 22 countries, World's fourth largest beef producer. In 2013, sold poultry and pork units to JBS.

9 Danish Crown AmbA

Founded 1998 after several mergers. 2012 revenues: 10,3 billion dollars. Major subsidiaries in USA, Poland and Sweden. Europe's largest meat producer, world's biggest pork exporter.

10 Harmel Foods

Founded 1891. 2012 revenue: 8.2 billion dollars. 40 manufacturing and distribution facilities. Owner of "Spam", a precooked meat product: focusing on ethnic food.

South Africa is an insignificant producer of meat in the global arena in comparison to the major producers in Brazil, the USA and Europe. Brazil's JBS, producers of beef, chicken and pork, is the highest earner, Tyson Foods ranked 2nd on the map, is one of the high ranking processors of chicken, beef and pork meats. While these two companies are considered high income generators, they are also reported to have been one of the biggest causes of pollution. This demonstrates that the management of abattoir waste is a global challenge as current waste management systems in this sector are inefficient and harming the environment.

The rise in the demand for meat products in Brazil, Russia, China and South Africa will impact on the amount of abattoir waste generated. It would not necessarily impact on production numbers in South Africa due to cheaper imports from the bigger producers.

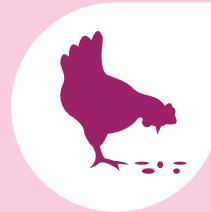
CURRENT PRACTICES LOCALLY IN THE WESTERN CAPE WITH POTENTIAL NEGATIVE IMPACTS

Currently there are 71 operational abattoirs in the WC, 26 high throughput, 38 low throughput and 7 rural throughput abattoirs distributed throughout the WC province.

The following treatment and disposal methods for abattoir waste were identified in the Hazardous Waste Management Plan for the Western Cape (HWMP) (DEA&DP, 2006b) subsequently formulated by the DEA&DP:



Buried in trenches, neutralised with lime and covered with soil



Processed for animal feed



Disposed of at poorly managed and non-permitted landfill facilities



Waste from the fruit industry used to manufacture compost

It is also evident that in many cases abattoir waste is not managed appropriately and often illegally dumped at unlicensed waste disposal facilities. Practices currently undertaken by abattoirs to dispose of dead/diseased carcasses also have the following potential problematic environmental implications.

| METHOD OF DISPOSAL | ENVIRONMENTAL IMPLICATIONS |
|--|---|
| Disposal through Municipal sewage | <ul style="list-style-type: none"> • This method causes odours which results in bad air quality. • It also places strain on the waste water treatment facilities. • Leakages from a defective sewer system can result in contamination of water sources above and below the surface. |
| Waste Disposal Facility | <ul style="list-style-type: none"> • This method causes a decrease in available airspace and leachate of heavy metals into the soil then straight to ground water causing pollution and destruction of the aquatic ecosystem. |
| Private dumping | <ul style="list-style-type: none"> • This method can affect human health by the spread of diseases via humans or animals that consume dead and diseased animal remains. |
| Burying on farms | <ul style="list-style-type: none"> • This method can potentially cause leachate of heavy metals resulting in water contamination and the spread of disease in humans and animals. |
| Incineration | <ul style="list-style-type: none"> • This method releases gases such as carbon dioxide and methane into the air contributing to global warming and odours. |
| Composting | <ul style="list-style-type: none"> • The primary concern associated with composting are physical-chemical parameters such as BOD, phenol, nitrogen and ammonia from sewage sludge and manure. • All these parameters may end up in water bodies (leachate or run offs) contaminating the groundwater and causing destruction in the aquatic ecosystems if the incorrect methods are used. |
| Rendering | <ul style="list-style-type: none"> • This method causes odours which are a result of the anaerobic breakdown of proteins by bacteria causing air pollution. The leaching of harmful substances such as nitrogen from carcasses to the groundwater causes eutrophication. |
| Anaerobic Digester | <ul style="list-style-type: none"> • Biogas combustion releases toxic trace gases such as ammonia, volatile organic compounds and hydrogen sulphide which result in toxic air contamination. Greenhouse gases causing undesirable weather conditions or patterns. |
| Alkaline Hydrolysis | <ul style="list-style-type: none"> • This method is associated with very toxic wastewater effluent that is hard to treat and is exposed into the external environment through run off/leaching, it could lead to the contamination of water bodies and result in the destruction of aquatic ecosystems. • This method also releases high levels of CO₂ which contributes to greenhouse emissions which result in changes in climatic conditions. |

CHALLENGES OF ABATTOIR WASTE

Abattoir waste is seen as **problematic** in the Western Cape due to:

- Increasing health risks due to the informal salvaging at landfill sites
- Negative environmental impacts (ground water contamination; climate change)
- Inefficiencies that impact on food security
- Landfill airspace shortage
- Uncertainty (awareness) regarding the disposal of abattoir waste has resulted in some illegal or unacceptable waste management activities
- Availability of abattoir waste disposal data lacking due to poor record keeping
- NEMA: Waste Act was promulgated with very little consultation with abattoir sector, and little knowledge of the extent of abattoir waste production in South Africa, and with no alternative solutions being offered to the industry.

GENERAL ENVIRONMENTAL IMPACTS OF ABATTOIR WASTE

Waste generated from livestock production include, but not limited to, CH₄ emissions which is a toxic gas released by the anaerobic decomposition of waste and has a number of impacts as including the following:



Air Pollution

The use of energy in activities such as chilling and freezing; smoking of meat and scorching of pigs; leads to air pollution that may cause problems such as:

- Global warming resulting from CO₂ emissions;
- changes in the ozone layer as a result of nitric oxide and nitrogen dioxide, methane, nitrous oxide and CFC emissions;
- acid rain as result of sulphur dioxide and ammonia emissions; and
- severe health conditions.



Airborne Waste

Potential sources of airborne waste originate from abattoir operations; for example, from the slaughter process. Listed below are a few sources of unpleasant and unwanted odours emanating from abattoir processes to consider:

- Stale materials and emissions escaping from cookers in the Rendering Plant;
- odour from urine and manure in holding pens;
- abattoir odours from solid wastes, i.e. paunch contents and blood residues;
- anaerobic treatment ponds may produce methane, ammonia and hydrogen sulphide; andw
- odours emanating from onsite composting processes.



Wastewater

Most processes involving the use of water and the discharge of waste water occur in the animal processing industry (i.e. abattoirs, tanneries and dairy plants) where water use is generally for cleaning purposes. The potency of the cleaning agent in the wastewater will depend on the nature of the process. Discharge of wastewater to surface water affects water quality in the following ways:

- Biodegradable Organic Compounds (BOCs) may cause a significant reduction in the amount of dissolved oxygen which may lead to reduced levels of activity or even death of aquatic life.
- Macro nutrients cause excessive growth of algae and mineral formation of algae. These may lead to aquatic life dying off because of the oxygen depletion.
- Agro industrial effluents may contain compounds that are directly toxic to aquatic life.

Problems resulting from the discharge of BOCs may be addressed by means of biological wastewater systems, either aerobic or anaerobic types.



Condemned (diseased)/Infectious Waste

The risk of infectious waste is the spread of diseases such as Anthrax and Brucellosis from animals to humans. The other condemned meat does not cause disease in humans but is rather condemned due to its unattractive appearance and as a result is not in demand.



Storm water runoff

Storm water which has been contaminated can have a detrimental environmental effect on surrounding living environments. Sources of storm water contamination may occur when it comes into contact with animal holding pens, sludge stockpiles and treated waste water irrigation areas.

2 The Regulatory Environment for Managing Abattoir Waste

| ENVIRONMENTAL LEGISLATION | SECTIONS RELATING TO ABATTOIR WASTE |
|---|--|
| <p>The Constitution of the Republic of South Africa, Act 108 of 1996</p> | <p>Chapter 2, the Bill of Rights, Section 24 states: “Everyone has the right to an environment that is not harmful to their health or well being, and to have the environment protected for the benefit of present and future generations through reasonable legislative and other measures that prevent pollution and ecological degradation promote conservation; and secure ecologically sustainable development and the use of natural resources while promoting justifiable economic and social development.”</p> |
| <p>National Environmental Management Act 107 of 1998</p> | <p>28. Duty of care and remediation of environmental damage states: (1) Every person who causes, has caused or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring, or, in so far as such harm to the environment is authorised by law or cannot reasonably be avoided or stopped, to minimise and rectify such pollution or degradation of the environment.</p> |
| <p>The National Environmental Management: Waste Act, No. 59 of 2008 (NEMWA) and The National Environmental Management: Waste Amendment Act, 2014</p> | <p>Schedule 3 of the NEM: WA classifies the non infectious portion of animal waste as general waste: “Category B1 Wastes from agriculture, horticulture, aquaculture, forestry, hunting and fishing, food preparation and processing (b) wastes from the preparation and processing of meat, fish and other foods of animal origin.” Blood is included under this definition. Non infectious condemned animal waste is viewed as waste and is classified as general waste.</p> |

IMPLICATION FOR THE ABATTOIR INDUSTRY

Abattoir owners have a shared responsibility to ensure that their activities do not infringe upon the environmental right of others. It is therefore important that abattoir waste is not released into our natural environment, i.e. illegal dumping, burying on farms and discharging untreated effluent into rivers as it may cause pollution, spread disease and overall environmental degradation in our communities.

The abattoir owner must ensure that measures are implemented to prevent any negative impacts on the environment. They can be held liable for corrective action under this legislation.

The abattoir owner must ensure that infectious abattoir waste is separated from non infectious condemned abattoir waste. They have different disposal requirements. See National Norms and Standards of disposal of waste to landfills below.



| ENVIRONMENTAL LEGISLATION | SECTIONS RELATING TO ABATTOIR WASTE |
|--|--|
| <p>Waste Classification and Management Regulations (WCMR) (23 August 2013, GG No. 36784 GN No. 634)</p> | <p>Section 4 (2) of the WCMR specifies that all waste generators must ensure that the waste they generate is classified in accordance with SANS 10234:2008. Waste listed in Annexure 1 of the WCMR does not require classification in terms of SANS 10234:2008. Annexure 1 (2)(a) refers to (iii) Non-infectious animal carcasses.</p> |
| <p>National Norms and Standards for the Disposal of Waste to Landfill (23 August 2013, GG No. 36784 GN No. 636)</p> | <p>Waste is evaluated in terms of the Norms and Standards for the Assessment of Waste for Landfill Disposal set in terms of Section 7(1) of the NEM: WA. According to Section 4 (2) (iii): non-infectious animal carcasses may only be disposed of at a Class B waste disposal facility or at one designed in accordance with the requirements for a G:L:B+ waste disposal facility, as specified in the Department of Water Affairs and Forestry (DWAF) Minimum Requirements for Waste Disposal by Landfill (2nd Edition, 1998).</p> <p>Section 5 (1) u: indicates that infectious animal carcasses and animal waste are prohibited and/or restricted from landfills with immediate effect, implying that treatment is needed before disposal at Class B.</p> |
| <p>National Environmental Management: Air Quality Act 39 of 2004 (NEM:AQA)</p> | <p>NEM: AQA, Section 35(2) imposes an obligation on the occupier of any premises to take all reasonable steps to prevent the emission of any offensive odour caused by any activity on such premises. 'Offensive odour' means any smell which is considered to be malodorous or a nuisance to a reasonable person.</p> |

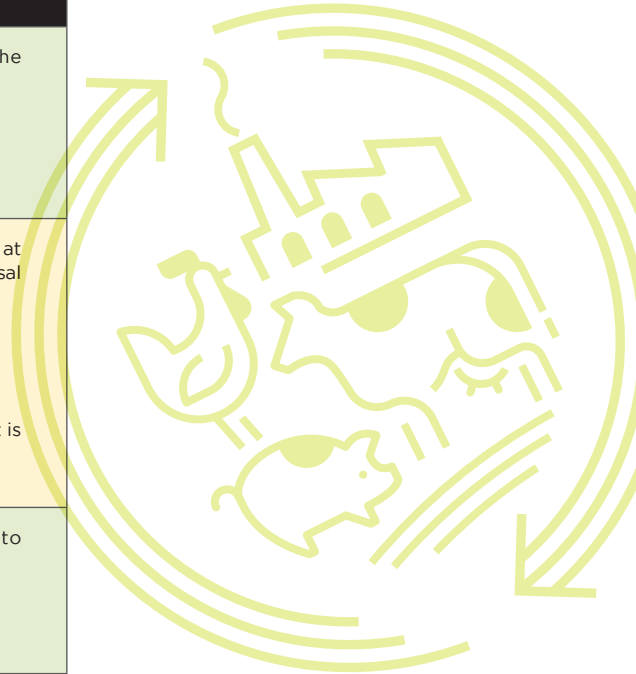
IMPLICATION FOR THE ABATTOIR INDUSTRY

The WCMR states that all generators of waste, including abattoir waste, must ensure that the waste they generate is classified according to the SANS 10234:2008.

Abattoir owners may only dispose of non infectious/condemned portions or animal carcasses at a Class B waste disposal facility or at one designed in accordance with the GLB+ waste disposal facility.

Infectious animal carcasses and animal waste is no longer accepted at a Class B site, treatment is therefore required before disposal at a Class B site.

In the context of abattoir waste management, it is important to note the provisions relating to odour control and the destruction of waste by burning (waste incineration).



ABATTOIR AND MEAT MANAGEMENT LEGISLATION

Meat Safety Act 40 of 2000

Section 11 Essential National Standards applies to all abattoirs as follows:

- (1) (i) “no dead animal or animal suffering from a condition that may render the meat unsafe for human and animal consumption may be presented at an abattoir”
- (r) “the treatment, removal or disposal of condemned material, effluent, refuse and emissions must be carried out in accordance with the prescribed (prescribed by regulation) procedures”

Red Meat Regulations, No. 1072, 17 September 2004

Part VIII describes the process of treating condemned material. Section 119 deals specifically with the disposal of condemned material as follows:

119. Any condemned material must be disposed of by –

- a) total incineration;
- b) denaturing and burial of condemned material at a secure site, approved by the provincial executive officer and local government, by –
 - 1. slashing and then spraying with, or immersion in, an obnoxious colorant approved for the purpose; and
 - 2. burial and immediate covering to a depth of at least 60 cm and not less than 100m from the abattoir, providing such material may not deleteriously affect the hygiene of the abattoir; or
- c) processing at a registered sterilizing plant.

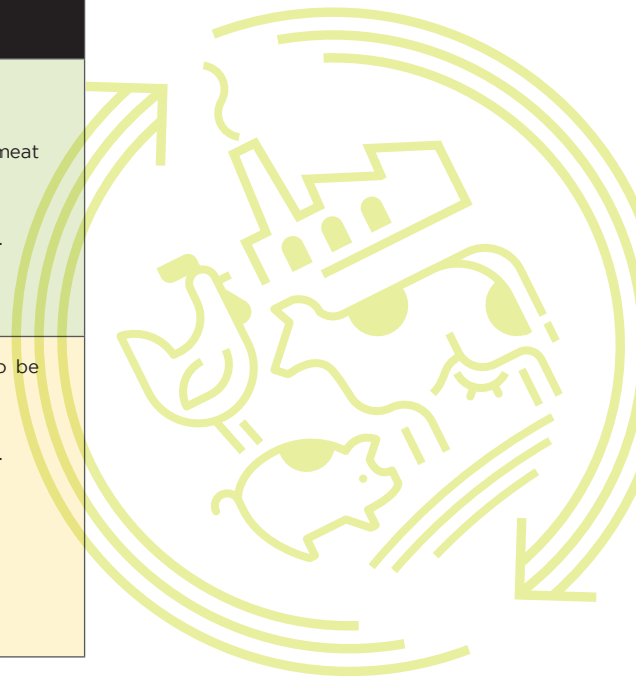
This act governs the safety of meat production, with the inclusion of waste management.

Farmers are not allowed to present a dead or sickly animal for slaughter at an abattoir as its meat may be unsafe for human and animal consumption.

It must be noted that these are outdated and the NEM:WA supersedes this legislative piece.

Condemned animal matter derived from the red meat slaughter process is expected to be incinerated, denatured and buried or sterilised.

It must be noted that these are outdated and the NEM:WA supersedes this legislative piece.



ABATTOIR AND MEAT MANAGEMENT LEGISLATION

Poultry Regulations, No. 153, 24 February 2006

Handling of dead birds

74. (1) Dead on arrivals, must be disposed of as condemned material in terms of Part VIII.

(2) No carcass or part thereof that has been condemned may be brought into any part of the abattoir containing edible products.

(3) If post-mortem examinations are performed on birds that are dead on arrival, to establish the cause of death, it must be performed in a special room or area with adequate facilities.

Disposal of condemned material

90. Any condemned material must be disposed of by -

total incineration;

denaturing and burial of condemned material at a secure site, approved by the provincial executive officer and local government, by -

slashing and then spraying with, or immersion in, an approved obnoxious colourant; and

- i. burial and immediate covering to a depth of at least 60 cm and not less than 100m from the abattoir, providing such material may not deleteriously affect the hygiene of the abattoir; or
- a. processing at a registered sterilising plant; and
- b. any other method for which a protocol has been approved by the provincial executive officer.

Ostrich Regulations, No. 54, 2 February 2007

Part VIII describes the procedure of treatment of condemned material and the disposal of condemned material. Section 11 number 104 deals with the disposal of condemned material and is described as follows:

104. Any condemned material must be disposed of by -

- a. total incineration;
- b. denaturing and burial of condemned material at a secure site, approved by the provincial executive officer and local government, by -
 - i. slashing and then spraying with, or immersion in, an approved obnoxious colourant; and
 - ii. burial and immediate covering to a depth of at least 60 cm and not less than 100m from the abattoir, providing such material may not deleteriously affect the hygiene of the abattoir; or
- c. processing at a registered sterilising plant; and

any other method for which a protocol has been approved by the provincial executive officer.

Condemned animal matter derived from the poultry slaughter process is expected to be incinerated, denatured and buried or sterilised.

It must be noted that these are outdated and the NEM:WA supersedes this legislative piece.

Condemned animal matter derived from the ostrich slaughter process is expected to be incinerated, denatured and buried or sterilised.

It must be noted that these are outdated and the NEM:WA supersedes this legislative piece.



ABATTOIR AND MEAT MANAGEMENT LEGISLATION

Animal Diseases Act, 1984 (Act no. 35 of 1984)

Provides for the control of animal diseases and parasites, for measures to promote animal health and for matters connected with this.

This act is of importance since the regulations were amended on 13 November 2009 by R1059. The amendment addresses the use of proteins from ruminant origins (excluding milk and milk products). Therefore it has a direct effect on the manufacturing of blood and bone meal.

OTHER IMPORTANT LEGISLATION

Fertilizers, Farm Feeds, Agricultural Remedies and Stock Remedies Act 36 of 1947

To provide for the appointment of a Registrar of Fertilizers, Farm Feeds and Agricultural Remedies; for the registration of fertilizers, farm feeds, agricultural remedies, stock remedies, sterilising plants and pest control operators; to regulate or prohibit the importation, sale, acquisition, disposal or use of fertilizers, farm feeds, agricultural remedies and stock remedies; to provide for the designation of technical advisers and analysts; and to provide for matters incidental thereto.

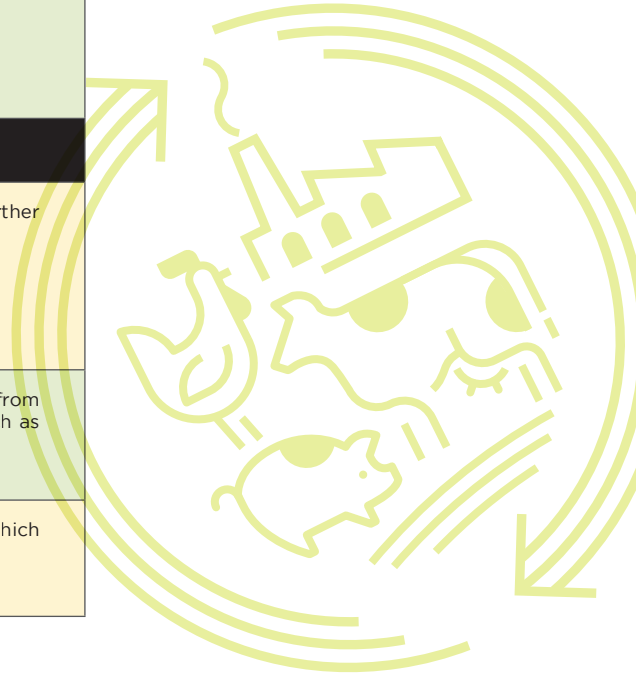
National Road Traffic Act 93 of 1996 (NRTA) and National Road Traffic Regulations

Chapter 8 of the Act addresses the transport of dangerous goods and thus hazardous waste that generated from any facility.

South African National Standards (SANS) 10228, 10229 and 10231

These Standards relate to legal requirements for the classification of dangerous substances, packaging requirements for transporting dangerous goods and operational requirements for transport of dangerous goods.

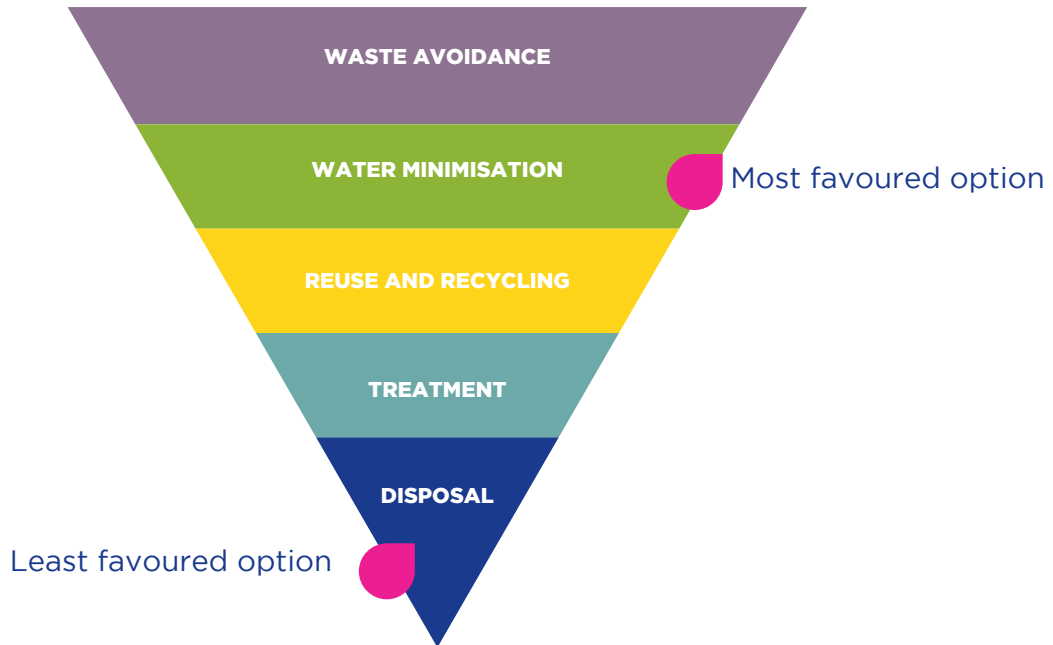
| | Wastes that produce a useable compost cannot be sold if it is not bagged. Bagging it, further requires tests to be conducted which may be expensive to the abattoir owner. |
|--|---|
| | The abattoir owner must ensure that the transport company transporting hazardous wastes from the abattoir must adhere to specific requirements aimed at the driver and the vehicle such as training requirements and managing spills. |
| | The abattoir owner must adhere to the requirements on storage of dangerous substances, which types of packaging to use to safely store waste, etc. |



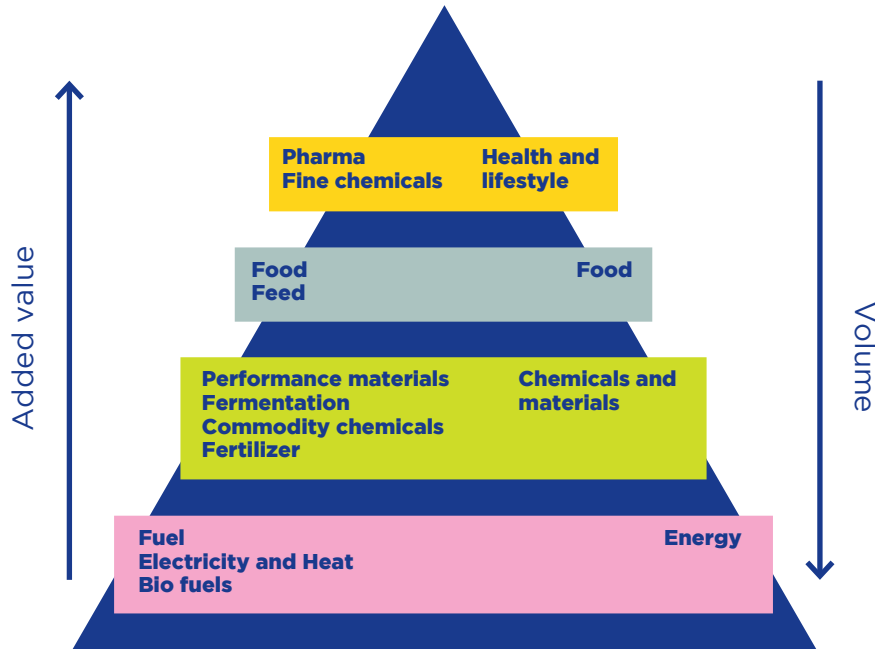
3 Abattoir Waste Management

ABATTOIR WASTE MANAGEMENT STRATEGIES

In considering potential solutions for managing abattoir waste the principles of the Waste Management Hierarchy should be taken into account. The Waste Management Hierarchy therefore considers all the other principles before disposal by landfill and would require innovations within the abattoir and slaughter process itself to avoid production of waste as far as possible.



A Value Pyramid for biomass which can be applied to abattoir waste has been developed where added value is the highest at the top of the pyramid and the lowest at the bottom, and on the contrary, the volume of biomass needed for the applications is the lowest at the top and the highest at the bottom of the pyramid. This pyramid indicates that if biomass can be used for the higher value applications, it should ideally not go directly to the lower applications, such as burning for energy recovery.



Considering the amount of waste per animal type, huge quantities of waste will need to be managed. This section will therefore discuss the current techniques available as well as possible innovations which could be implemented in the abattoir industry.

BASIC WASTE MANAGEMENT TECHNIQUES

Implementing the most basic practices eliminates high costs associated with various waste management techniques. They may be very simple techniques, but very effective in reducing cost and harm to the environment.



Separation of waste

Where no separation takes place, the condemned material will be classified as hazardous wastes regardless of being infected material or not. This will place further strain on the abattoir to manage their wastes as hazardous waste requires authorisation if more than 500kg per day is generated. Mixing the waste also means that your hazardous waste disposal costs will be higher as

more waste (infected or not) will require treatment under this category.

Separation bins placed strategically means that waste can be dealt with in various ways that could potentially decrease expenditure on hazardous waste management. Therefore, it is recommended to procure waste separation bins for the non infectious condemnns and a separate one for infectious wastes.



Separation bins

Currently, the MSA requires all condemned waste to be placed in a marked leak proof bin. With the condemned waste now classified, infectious condemned waste can be separated from general condemned waste through the use of a very similar bin. Separation will occur at the slaughter line so as to eliminate contamination of general condemned waste. This system is further promoted by the Department of Agriculture.



Boil the condemnns

In order to assist the separation technique, it is recommended that the waste be boiled. This is especially good for the infectious wastes. It potentially limits the growth of psychotropic and mesophilic bacteria, it may also limit growth of some thermoduric bacteria. It may not eliminate all bacteria but it does limit the potential of growth for some bacteria which can be dealt with as per the next point. Pressure cookers may be needed for this to improve the boiling method.



Freezing

The procurement of chest freezers may be used to temporarily store wastes that can only feasibly be managed in large

quantities later

on. This will especially benefit abattoirs with small quantities of waste. Separation of waste within the freezer will still be needed as final treatment of hazardous (infectious condemnns) and general (non infectious condemnns) waste will differ.

In most cases the chest freezer is used in outlying areas, where the quantities of infectious waste produced does not justify transport costs associated with proper treatment at a hazardous waste disposal facility or any other facility capable of managing infectious wastes.

This process is also in agreement with the Red Meat Regulations s118 which manages the handling of infectious condemned material where temporary storage can be done in a “holding area or room or dedicated chiller, except if removed on a continuous basis”. It also states that the chiller or freezer will need to maintain a temperature of no more than -2°C.



Predator Feeding

Some condemned wastes can be stored to be used for predator feeding.

Condemned waste intended for animal food is edible by animals if:

- the waste hosts no transmittable disease,
- the waste is not bearing zoonotic diseases that can spread to the handlers of this condemned waste,
- the waste is lesion free.

The specific types of condemned waste to be fed to predators must be approved by a veterinarian.

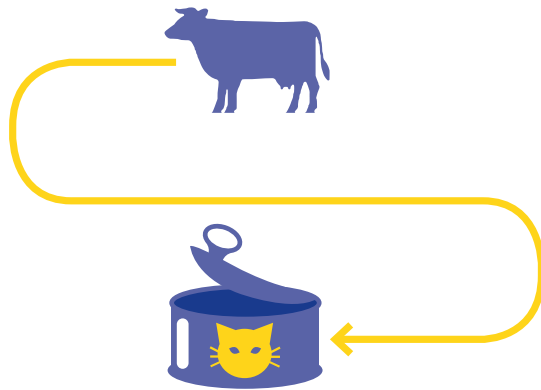
FURTHER TREATMENT TECHNIQUES

A summary of waste management techniques with reference to by-product management

| ABATTOIR BY-PRODUCT(S) | BY-PRODUCT MANAGEMENT TECHNIQUES | END PRODUCT(S) | USE/APPLICATION |
|---|--|---|---|
| <p>Abattoir waste:</p> <p>Inedible meat and waste products</p> | <p>Rendering</p> <ul style="list-style-type: none"> Inedible rendering Edible rendering | <p>Inedible rendering: Bone and poultry meal. Edible rendering: Tallow (animal fat), blood and meat bone.</p> | <p>Used for pet food.</p> <p>Suitable for human consumption.</p> |
| <p>Abattoir waste:</p> <p>Paunch content; off-cuts of meat; offal; blood mixed with kraal manure.</p> | <p>Composting (dependant on the level of technology used)</p> <ul style="list-style-type: none"> Vermi-composting | <p>Leachate, biogas, high quality compost. Vermi-compost, worm tea (leachate), worms.</p> | <p>Nutritive value of vermi-compost for agriculture. Worms as animal feed.</p> |
| <p>Abattoir waste:</p> <p>Whole and portions of carcasses; infectious condemnns and condemnns.</p> | <p>Incineration</p> | <p>Heat, steam and then energy generation.</p> | <p>Generates electricity.</p> |
| <p>Animal waste:</p> <p>Animal manure and carcasses</p> | <p>Anaerobic Digestion (AD)</p> | <p>Carbon dioxide, Methane gas and a nutrient-rich digestate.</p> | <p>Generates biogas that can be used to produce heat and/or electricity. Also used to power vehicles. Used as a soil conditioner. A pathogen and odour-free fertilizer.</p> |

| ABATTOIR BY-PRODUCT(S) | BY-PRODUCT MANAGEMENT TECHNIQUES | END PRODUCT(S) | USE/APPLICATION |
|--|---|--|---|
| Abattoir waste | Alkaline Hydrolysis (AH) | Dried waste material. | Soil additive or composted. |
| Animal waste | Air Curtain Burners | Ash | Used as soil additive in fertilizers and sold to plant nurseries and farms. |
| Any animal waste material: Feathers; fat; organs; intestines; etc. | Low Pressure Tissue Processing | Hydrolysed protein. Mineral ash from bones and teeth, small peptides, amino acids, sugars, nutrients and soaps. | Hydrolysed protein is used in the manufacturing of certain specially formulated hypoallergenic dog foods for dogs that suffer from allergies. |
| Biomass: Animal manure | Pyrolysis | Syngas, pyrolysis oils, electricity/heat, feedstock, bottom ash, char (slag) and fly ash (dependant on the material used). | Oils serve as furnace fuel or used for diesel generators. Steam is used to run turbines to generate electricity. |
| Abattoir waste: Chicken manure. Optional: Brewery waste; pre-consumer food waste. | Fly Farming | Compost residue (similar to vermicompost) Mag meal (larvae). | Soil conditioner on agricultural land. Mag meal used as animal feed. |

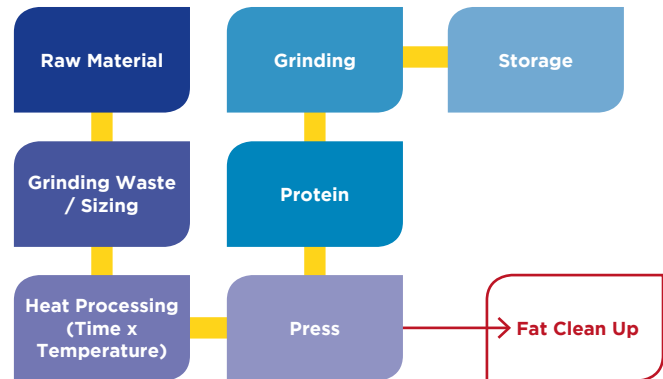
RENDERING OF ABATTOIR WASTE



Rendering converts waste products unfit for human consumption into useful products. This is mainly through a variety of drying and separation processes. The bone and poultry meal derived from the process can further be used as resources for pet food. Rendering has varying processes that can then be divided into two categories:

- Edible rendering involves processing and producing meat types such as tallow, blood and meat bone.
- Inedible rendering is done through batch processing to dry out any fat from fat cells in a carcass.

The basic process can be summed up in the figure below:



Source: National Rendered Association: Essential Rendering; Meeker, David; 2006

The rendering process includes mainly applying heat, abstracting water from the wastes and then separating fats. Waste is firstly ground into smaller pieces where it is placed into a cooking receptacle and is cooked. This waste is then pressed so as to separate the melted fats from the protein. Also removed is the bone solids and moisture. Fat can then be stored for further use.

Wet or dry wastes are processed, sterilised and mixed for proteins and fats to produce tallow and meal.

- Wet processing: Boiling water or steam is added to material causing the fat to surface.
- Dry processing: Raw material is dehydrated causing the fat release.

Considerations when implementing a rendering system include:

- Temperature usage.
- Batch or continuous processing.
- Intended use of the end product.

It is important to note that temperature and duration of the heating process is essential to the type of final product you wish to end up with.

Advantages of rendering:

- Reduces large volumes of waste deposited in landfills.
- Inactivates bacteria, viruses, protozoa and parasites.
- Good quality end product that can be sold to generate another income source.

Disadvantages of rendering:

- Removing water from the condemned waste will result in high energy costs.
- Effluent water must be treated.
- Odour nuisance.

Authorisation requirements for rendering:

- Rendering is viewed as treatment of waste. Treatment in excess of 10 tons of general waste will require a waste management licence (GN No. 921 Category A 3 (6), Category B 4 (6)), treatment in excess of 500 kg of hazardous waste will require a waste management licence (GN No. 921 Category A 3 (7), Category B 4 (4)).
- The grinding or chipping of general waste at a facility with an operational area in excess of 1000m² will require a waste management licence (GN No. 921 Category A 3 (2)). Please note that the operational area is inclusive of storage areas. There is no listed activity for the grinding or chipping of hazardous waste; grinding or chipping of hazardous waste should be seen as treatment of hazardous waste, see above.
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COMPOSTING ABATTOIR WASTE (INCLUDING VERMI-COMPOSTING)



Composting is a controlled biological process in which organic materials are broken down by micro-organisms which produce compost. Compost has a high nutrient value and is used to improve the quality of soil and can be cultivated by using a variety of methods.

The types of abattoir waste that can be added to make compost is paunch content, off cuts of meat, offal and blood mixed with kraal manure. Approximately 5 to 10 tonnes of organic waste can be composted per day. Non infectious condemned material may be composted as a safe disposal option although the heat generated through composting can destroy harmful pathogens, bacteria etc. The type of organic waste material to be added would depend on the system used.

Advantages of composting:

- Inexpensive if piles are turned every few weeks, to limit the use of equipment.
- Moderate cost.
- Labour intensive.
- Ability to use a front end loader and other generic types of equipment.
- Generally satisfactory quality and marketability of the final product.
- Energy efficient.
- Ideally used for the digestion of partially composted material; use in conjunction with tissue processors.

Disadvantages of composting:

- Space required.
- Preference for a remote site, which can result in higher transportation costs.
- It is also difficult to maintain high rate or “hot” compost conditions, so the compost products from minimal tech methods will likely be lower in quality - they will also be coarser, and when screened will have a larger oversize fraction.
- Less control over issues such as odour, dust, leachate, water contamination, vectors, pests, litter, noise and fire.
- More difficult to achieve consistent results.
- Potential for odours.
- Not successful on raw material such as solid wastes produced by animal production.

Authorisation requirements for Composting:

- Composting is viewed as treatment of waste. Treatment in excess of 10 tons of general waste will require a waste management licence (GN No. 921 Category A 3 (6), Category B 4 (6)), treatment in excess of 500 kg of hazardous waste will require a waste management licence (GN No. 921 Category A 3 (7), Category B 4 (4)).
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INCINERATION OF ABATTOIR WASTE



Incineration is the combustion of waste at high temperatures in the presence of oxygen to reduce the need for landfill space and recovery of energy. Combustion is a rapid, exothermic reaction between fuel and oxygen. In incineration applications, the fuel is predominately waste, and the oxygen source is air.

This process produces pollutants such as dioxins and furans, heavy metals, acid gases and particulate matter. The process of incineration starts with the reception of waste followed by the sortation with the use of an overhead crane and then placed within an incinerator's combustion chamber. Waste heat produced by the combustion of both fuel and waste products is captured and used to convert water into steam, which is then used to generate electrical power. Emissions

from the combustion process are captured by a high efficiency filtration system, and residual ash is collected and packaged before being transported to a landfill by covered leak proof trucks.

Advantages of incineration:

- Heat production to produce steam to yield electricity, reducing the need for fossil fuels.
- During high temperature treatment, this process destroys pathogens.

Disadvantages of incineration:

- High capital costs.
- The smoke given off produces huge volumes of air pollution.
- Requires proper operation and regular maintenance in order to control air quality.



Authorisation requirements for Incineration:

- Incineration is viewed as treatment of waste. Treatment in excess of 10 tons of general waste will require a waste management licence (GN No. 921 Category A 3 (6), Category B 4 (6)), treatment in excess of 500 kg of hazardous waste will require a waste management licence (GN No. 921 Category A 3 (7), Category B 4 (4)).
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ANAEROBIC DIGESTION (AD) OF ABATTOIR WASTE



Anaerobic digestion can also be referred to as Biogas treatment.

It is the process whereby micro organisms break down matter that is biodegradable in an environment that has no oxygen. This process is natural and gases that are released can be captured and put to good use. There are 4 biochemical processes (described below) involved in this process, and they occur partly at the same time.

- **Hydrolysis**
The process is slow and involves complex organic material being transformed to polymers and monomers that are liquefied by bacteria.
- **Acidogenesis**
Amino acids and sugars are altered to ethanol and acids, leading to ammonia being produced.

- **Acetogenesis**
Hydrogen, carbon dioxide and acetic acid are formed after substances are transformed.
- **Methanogenesis**
The methanogenic bacteria are involved in changing the acetic acid and hydrogen into methane gas and carbon dioxide.

Advantages of Anaerobic Digestion:

- The process sterilises pathogens and are removed from the waste.
- Process helps minimise the odour being released.
- Disposal costs avoided as waste is decomposed and diverted from landfill.
- Renewable energy is produced which reduces the need to harvest fossil fuels for energy.
- Waste is used as a resource, value is recovered from waste.
- Reduces global warming because the greenhouse gases captured are used to produce energy.
- Produces useful end products, the nutrient rich digestate will be used to condition and fertilise the soil and biogas for energy as mentioned above.

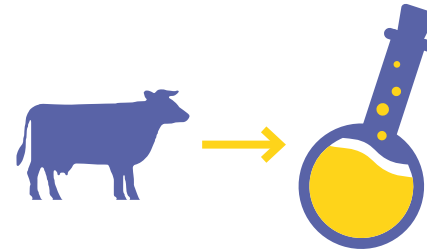
Disadvantages of Anaerobic Digestion:

- The process is slow and sensitive.
- The process is complicated and therefore needs staff that are well trained.

Authorisation requirements for Anaerobic Digestion:

- Anaerobic digestion is viewed as treatment of waste. Treatment in excess of 10 tons of general waste will require a waste management licence (GN No. 921 Category A 3 (6), Category B 4 (6)), treatment in excess of 500 kg of hazardous waste will require a waste management licence (GN No. 921 Category A 3 (7), Category B 4 (4)).
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ALKALINE HYDROLYSIS (AH)



Alkaline hydrolysis (AH) is a natural process that breaks down abattoir waste into its' simpler form for further disposal. It converts animal waste into dried material with less threat to the environment than before treatment. AH can be conducted with or without heat, however with the inclusion of heat the process is highly accelerated.

The process is conducted in a pressure vessel, with the water and an alkaline solution added to the waste along with heat pressure of about 150°C to produce a sterile aqueous solution mainly made up of the simpler compounds like peptides, amino acids, sugars and soaps. The remnants of the process may then be crushed to form part of a soil additive or to be composted.

Studies investigated have shown that AH kills pathogens successfully such as fish pathogens (infectious salmon anaemia virus). AH eliminates abattoir waste by 97 % and the method also reduces the nuisance odour smells (Franke-Whittle & Insam, 2013).

Careful consideration needs to be given to cost, disease inactivity, environmental risk and resource availability.

Advantages of Hydrolysis:

- Can reduce waste by up to 97%
- Destroys pathogens
- Limited odour nuisances
- Minimised gaseous emissions

Disadvantages:

- The end product (alkaline solution) is often difficult to manage.
- Capacity may be limited – may not be of assistance to large abattoirs
- Huge amount of energy used for the process through heating.
- Waste and odour nuisances if not properly managed.

Authorisation requirements for Alkaline Hydrolysis:

- Alkaline hydrolysis is viewed as treatment of waste. Treatment in excess of 10 tons of general waste will require a waste management licence (GN No. 921 Category A 3 (6), Category B 4 (6)), treatment in excess of 500 kg of hazardous waste will require a waste management licence (GN No. 921 Category A 3 (7), Category B 4 (4)).
- The grinding, chipping or crushing of general waste at a facility with an operational area in excess of 1000m² will require a waste management licence (GN No. 921 Category A 3 (2)). Please note that the operational area is inclusive of storage areas. There is no listed activity for the grinding, chipping or crushing of hazardous waste; grinding, chipping or crushing of hazardous waste should be seen as treatment of hazardous waste, see above.
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AIR CURTAIN BURNERS



Air curtain burners is an example of an incineration type of technology that is new to the management of animal waste as it was initially intended for the burning of wood with the aim of controlling particulate matter, mainly smoke. However, it has evolved to manage outbreaks in remote areas in the UK, where it dealt with Avian Influenza bird disposal. Trials conducted for animals affected by BSE and Avian flu, indicated that BSE needed a burning temperature at 850°C while Avian Flu needed a minimum of 72°C.

Three machines make up the “standard” version FireBox, all of which differ in size or capacity. These are inexpensive and environmentally friendly. Waste wood fuels the Firebox and burns till the fire is hot enough

to break down the carcass. (The best results and best efficiency rate at temperatures of 1200°C.) At least 60cm of burning coal is needed to achieve this. Carcasses are then loaded followed by a layer of coal from the burnt wood. For each layer of abattoir waste placed, a layer of burning coal is needed. At the end of the day, the remaining ash is removed to be disposed of or used elsewhere. The airflow inside the FireBox forms a curtain over the fire, while the fire is over supplied with oxygen to ensure a cleaner and complete burn.

When considering the use of the air curtain burner one needs to understand the volume of abattoir waste produced by the abattoir, as this will guide decisions on the correct system to be used. For further efficiency, a waste to energy system may be installed to the FireBox to generate electricity that can be fed back into the abattoir for use. Larger facilities may benefit from this as about 40MW per day can be generated.

Advantages:

- Turns waste material into ash for fertiliser.
- Successfully destroys pathogens.

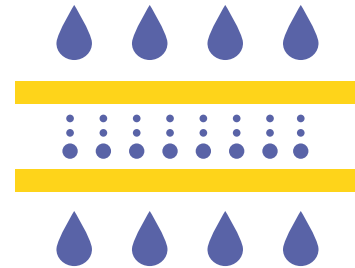
Disadvantages:

- CO₂ release possible.
- Malodorous emissions possible.

Authorisation requirements for Air Curtain Burners:

- Air curtain burners are viewed as treatment of waste. Treatment in excess of 10 tons of general waste will require a waste management licence (GN No. 921 Category A 3 (6), Category B 4 (6)), treatment in excess of 500 kg of hazardous waste will require a waste management licence (GN No. 921 Category A 3 (7), Category B 4 (4)).
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LOW PRESSURE TISSUE PROCESSING SYSTEMS



A WRT MAAHP Tissue Processor is a mechanically engineered processor that breaks down Protein Based Materials (PBM) by means of a catalysed thermo chemical process. The aforementioned process causes irreversible hydrolysis of the protein back to its original structure. The Tissue Processor can “consume” any animal waste material, e.g. fat, feathers, organs, intestines, etc. The three main components, used in MAAHP systems, to dissolve animal tissue is heat, water, a base catalyst and then be mechanically agitated. Products which arise from this process are small peptides, amino acids, sugars, nutrients and soaps and inclusive of the mineral ash of bones and teeth (calcium phosphate). Hydrolysed protein can then be sold for further use.

Advantages:

- Energy efficient with minimal odour emissions.
- Indigestible materials present in the tissue will still benefit from the thermo chemical treatment, i.e. pathogen control.
- It is a mechanised system which need little labour intervention.
- The resulting liquids and solids are pathogen free.
- Allows for on site treatment and no waste sorting is required.
- Cost recovery options are available. Cost recovery within 2 – 3 years.

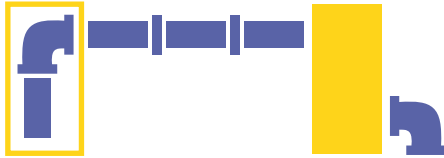
Disadvantages

- It has not been field tested using prion infected material.
- It is not designed to fully digest plant material and is ineffective against inorganic substances.
- No energy is recovered from the waste but from a secondary process.
- Not suitable for large volumes of carcasses, i.e. from large scale facilities.

Authorisation requirements for Air Low Pressure Tissue Processing Systems:

- Low Pressure Tissue Processing Systems is viewed as treatment of waste. Treatment in excess of 10 tons of general waste will require a waste management licence (GN No. 921 Category A 3 (6), Category B 4 (6)), treatment in excess of 500 kg of hazardous waste will require a waste management licence (GN No. 921 Category A 3 (7), Category B 4 (4)).
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PYROLYSIS



Pyrolysis is the breakdown of waste with heat and no additional oxygen. Temperatures used for effective pyrolysis can be lower than incineration and ranges from 300°C - 500°C. These temperatures ensure that the hydrocarbon content of the waste feed reacts and generates various products like syngas, pyrolysis oils, electricity/heat, feedstock for chemical industry, bottom ash, char or slag and fly ash, depending on what material was used as waste feed. Waste such as glass, metal and any other inert waste like rubble are generally not ideal for pyrolysis, hence the importance of implementing the waste hierarchy, specifically waste minimisation before rendering an item to this system. The need for this process to be without additional air or oxygen means that the process is extremely controlled. This may even be to the point of conducting the process in a vacuum styled environment. In some cases, the pyrolysis reactor will be constructed with solid seals to limit the intake of oxygen as far as possible.

The process is based on a rotary kiln. When the waste arrives at the site, it undergoes sorting and pre treatment. A rotary kiln reactor is then filled with the waste feed. The gas given off is then cooled and the pyrolysis oil is condensed and collected in drums. The oils then serve as furnace fuel or used for diesel generators. Energy derived from non condensed gases heats up the system and generates steam. The steam is used to run turbines to generate electricity. However, the residues such as inert mineral ash, inorganic compounds and unreformed carbon, generated during the process of pyrolysis are toxic. These plants are highly dependent on the numbers in feedstock available, in order to work effectively. The flexibility of these plants makes it easy to operate though.

Advantages:

- The emissions generated by the process are fewer, due to the limited use of oxygen, so these emissions are easier to control through scrubbers which remove contaminants.
- Pyrolysis produces more useful products for various applications. For example, gases, oils and solid char produced from pyrolysis can be used as a fuel, or purified and used as a feedstock for petro chemicals and other applications.
- Pyrolysis reduces climate change by replacing coal and natural gas as a viable fuel.

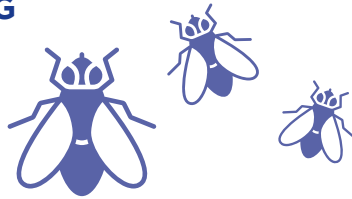
Disadvantages of pyrolysis:

- Generates possible toxic residues such as inert mineral ash, inorganic compounds, and unreformed carbon.
- Potential to produce a number of possible toxic air emissions such as acid gases, dioxide, particulates, etc.
- Pyrolysis plants require a certain amount of materials to work effectively.

Authorisation requirements for pyrolysis:

- Pyrolysis is viewed as treatment of waste. Treatment in excess of 10 tons of general waste will require a waste management licence (GN No. 921 Category A 3 (6), Category B 4 (6)), treatment in excess of 500 kg of hazardous waste will require a waste management licence (GN No. 921 Category A 3 (7), Category B 4 (4)).
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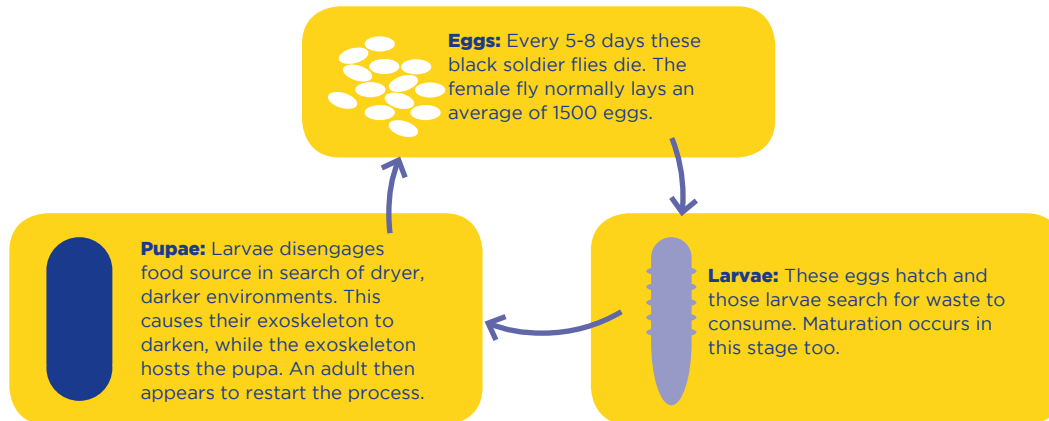
FLY FARMING



Black Soldier Flies (*Hermetia illucens* or BSF) are natural scavengers and they flourish in organic waste material. They often lay eggs in these wastes and the larvae produce many value added outputs which Fly farming focusses on. These flies normally feed on organic wastes such as human excreta, animal manure, food waste and even abattoir wastes.

Fly farming basically requires light, temperature and humidity to ensure that fly breeding can occur. These flies are kept in cages with all the required elements mentioned before. Conditions in these cages are favourable for the female to lay eggs, as if it were to happen in the natural environment. The flies then go through its lifecycle and upon hatchery they are added to the organic waste. This works best if the waste is ground or broken up into smaller pieces.

Lifecycle of the BSF



The pupae are harvested to be fed to animals as feed or further processed, i.e. pressed, crushed and dried. Oil is extracted and compost processed, all of these for further use. The end products of this process include residue like compost and larvae for feed. In the Western Cape this process is done by a company called Agriprotein situated in Philippi. Agriprotein receive and treat organic waste to produce protein feed, extruded oil and compost. This is a good example of managing waste in an environmentally sound manner. Fly breeding takes place in an internal sealed room with specially designed fly cages.

Managed as an “above ground organic landfill”, Agriprotein processes waste at a per tonnage fee way lower than landfill tariffs.

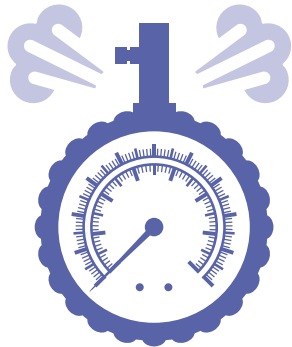
Advantages:

- Process large amounts of organics in a short time frame.
- Deals with a wide variety of organics.

Authorisation requirements for fly farming:

- Fly farming is viewed as treatment of waste. Treatment in excess of 10 tons of general waste will require a waste management licence (GN No. 921 Category A 3 (6), Category B 4 (6)), treatment in excess of 500 kg of hazardous waste will require a waste management licence (GN No. 921 Category A 3 (7), Category B 4 (4)).
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STERILISATION



Sterilisation plants are well known in the abattoir industry. They manage abattoir waste to produce a high grade stock fodder for further use. The input is mainly bones and other meat material.

These materials are exposed to saturated steam in a tank so that air is replaced with steam at a certain pressure point. This pressure is then kept constant for a specific timeframe ranging from 20 minutes to 2 hours.

These plants must however adhere to clauses set out under the Meat Safety Acts' regulations. Products produced through the sterilisation plants may not be sold as per the Fertilisers, Farm Feeds, Agricultural Remedies and Stock Remedies Act, Act 36 of 1947.

Authorisation requirements for sterilisation:

- Sterilisation is viewed as treatment of waste. Treatment in excess of 10 tons of general waste will require a waste management licence (GN No. 921 Category A 3 (6), Category B 4 (6)), treatment in excess of 500 kg of hazardous waste will require a waste management licence (GN No. 921 Category A 3 (7), Category B 4 (4)).
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4 Disposal of Abattoir Waste to land

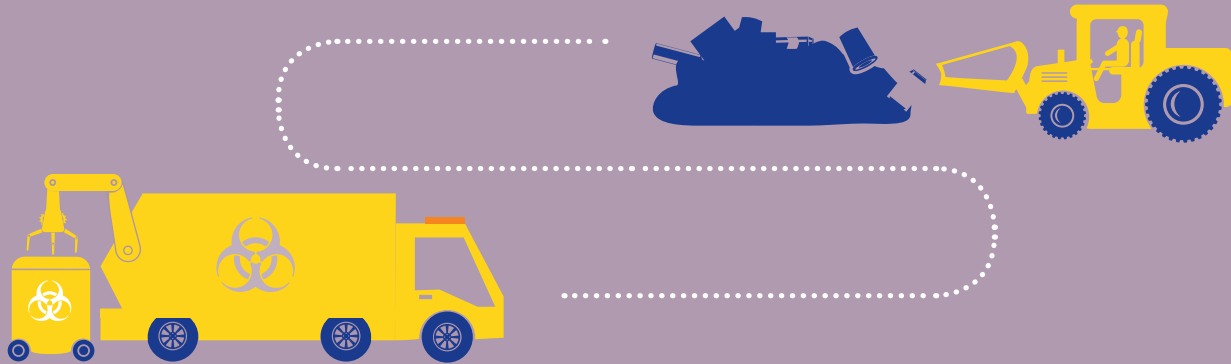
1. It must be noted that non infectious abattoir waste can only be disposed at an authorised waste disposal facility.
2. Should the Permit/Licence Holder consider accepting animal waste at his/her WDF, a site specific motivation must be submitted to the Department of Environmental Affairs and Development Planning, confirming that the following disposal methods and requirements can and will be implemented at all times:
 - 2.1. The waste body has a minimum thickness of 1.8m above the bottom liner prior to the disposal of animal waste;
 - 2.2. The WDF is equipped with a functional leachate management system or will not generate significant amounts of leachate, even if animal waste is disposed of on the WDF (appropriate co-disposal liquid/solid ratio must be calculated and maintained);
 - 2.3. The Permit/Licence Holder must specify and submit to this Department the plant that will be used to excavate trenches into the waste body and cover the animal waste;
 - 2.4. Animal waste may only be disposed of in pre-excavated trenches, deep enough to ensure that all the animal waste is immediately covered with a minimum thickness of 500mm waste or cover material to prevent easy access to pickers or scavengers, putrid odour and vermin nuisance conditions;
 - 2.5. Before covering the animal waste and immediately after disposal this waste must be treated with slaked or hydrated (not chlorinated) lime;
 - 2.6. Only WDFs with effective access control will be considered suitable for the disposal of animal waste; and
 - 2.7. Written agreements between the generators / transporters of animal waste, and the Permit/Licence Holder must be drawn-up and kept at the WDF. These agreements must specify the type of waste, amount of waste and time of disposal or notice time required by the landfill operator to prepare the trenches.
3. This Department can prohibit the disposal of animal waste at any WDF, should the disposal of such waste cause or pose an unacceptable risk of pollution nuisance conditions or health risks.
4. Even if the landfill is permitted to accept such animal waste, it remains the prerogative of the Permit/Licence Holder to accept or reject that waste and to limit the amount and type of non infectious animal waste according to what the landfill can handle without creating nuisance conditions or pose a pollution risk.
5. GN R 636 also states that: "The classification and containment barrier design of all new landfills, as well as new working cells at existing landfills, must be implemented in accordance with section 3(1) and (2) of these Norms and Standards."

The Departments' interpretation of this section is that non infectious animal waste and carcasses that are intended for disposal at landfills and new cells constructed after 23 August 2013, may only be disposed of at such landfills and new cells, if they have a containment barrier designed in accordance to the requirements for such a barrier for a Class B landfill facility.

- 6.** GN R. 636 further specifies that infectious animal carcasses and animal waste are prohibited from disposal to land with immediate effect, implying that it needs to be treated before disposal at a Class B landfill facility, as under (11) above.
- 7.** "Treatment" is defined in the NEM:WA as any method, technique or process that is designed to -
 - (a) change the physical, biological or chemical character or composition of a waste; or
 - (b) remove, separate, concentrate or recover a hazardous or toxic component of a waste; or
 - (c) destroy or reduce the toxicity of a waste, in order to minimise the impact of the waste on the environment prior to further use or disposal.
- 8.** In terms of GN No. 921 of 29 November 2013 (GN No. 921), NEM:WA, 2008 (Act No. 59 of 2008) List of waste management activities that have, or are likely to have, a detrimental effect on the environment, Category A, 3 (6) the treatment of general waste using any form of treatment at a facility that has the capacity to process in excess of 10 tons but less than 100 tons requires a Waste Management Licence (WML).
- 9.** In terms of GN No. 921 Category A, 3 (7) the treatment of hazardous waste using any form of treatment at a facility that has the capacity to process in excess of 500 kg but less than one ton per day, excluding the treatment of effluent, wastewater or sewage requires a WML. This means that hazardous waste can be treated without a WML if it is less than 500 kg per day.
- 10.** In terms of GN No. 921 Category B, 4 (4) the treatment of hazardous waste in excess of 1 ton per day calculated as a monthly average; using any form of treatment, excluding the treatment of effluent, wastewater or sewage requires a WML.
- 11.** Subsequent to treatment, the onus is on the owner of the treatment facility to prove that the infectious agents in the waste have been killed, and that the waste can now be regarded as general waste.
- 12.** Please note that if infectious animal waste and carcasses (both are hazardous wastes) are mixed with general animal waste, the whole volume of waste will be regarded as hazardous. It is therefore recommended that infectious animal waste not be mixed with the general animal waste.
- 13.** Please adhere to the National Norms and Standards for the Storage of Waste in terms of GN No. 926 of 29 November 2013, if the volumes of waste stored exceeds 80m³ for hazardous waste and/or 100m³ for general waste.

This Department reserves the right to revise or withdraw comments or request further information from you based on any information received.

5 Landfill sites in the Western Cape authorised to accept abattoir waste



The abattoir waste can be disposed of at the following waste disposal facilities.

1. City of Cape Town, Bellville South
2. City of Cape Town, Coastal Park
3. City of Cape Town, Vissershok
4. City of Cape Town, Averda/ Enviroserve Vissershok (private site)
5. Eden District Oudtshoorn
6. Langeberg Ashton
7. Swartland Highlands
8. Beaufort West special permission granted to under specified conditions

● Waste Disposal Facility accepting abattoir waste

NORTHERN CAPE

WEST COAST

Vaalkoppies ●

CENTRAL KAROO

EASTERN CAPE

CAPE WINELANDS

Highlands ●

Vissershok ●

Ashton ●

Grootkop (Oudtshoorn) ●

Bellville South ●

EDEN

Coastal Park ●

OVERBERG

ATLANTIC OCEAN

INDIAN OCEAN



DEFINITION OF TERMS

Abattoir waste can be defined as waste or waste water from an abattoir which could consist of pollutants such as animal faeces, blood, fat, animal trimmings, paunch content and urine.

Beneficiation means the use of primary and secondary wastes as valuable, re-usable products.

By products is abattoir waste from the carcass, other than the carcass and edible offal during the slaughter process.

Carcass (Abattoir) means the dressed carcass derived from an animal after the hide or skin (or hair in the case of pigs), the entrails, the pluck, the shank and head (in the case of cattle, sheep, and goats), the tail (in the case of cattle), the diaphragm and lactating udders have been removed.

Condemned material is an animal or parts of an animal inspected and judged, or otherwise determined, to be unacceptable for human and animal consumption and requiring sterilising or destruction.

Contaminated means the presence in or under any land, site, buildings or structures of a substance or micro organism above the concentration that is normally present in or under that land, which substance or micro organism directly or indirectly affects or may affect the quality of soil or the environment adversely.

Inedible materials refer to parts of an animal unsuitable for human consumption but not requiring destruction.

Storage means the accumulation of waste in a manner that does not constitute treatment or disposal of that waste.

Suspended Solids means particles disseminated in and carried by water.

Waste disposal facility means any site or premise used for the accumulation of waste with the purpose of disposing of that waste at that site or on that premise.

Waste management licence means a licence issued in terms of section 49 of the National Environmental Management: Waste Act 59 of 2008.

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