Annex to:

Annex A – Protocol

Terms of Reference (ToR)

Original ToR:

In accordance with Article 29 of Regulation (EC) No 178/2002, the Commission requests EFSA to provide a scientific opinion concerning the capacity of certain specific processing or transformation methods used in the production of organic fertilisers and soil improvers (OF/SI) in view of determining the endpoints in the manufacturing chain of CE-marked EU fertilising products.

In particular, the scientific opinion should comprise an assessment of the biological risks to animal and public health deriving from the use as OF/SI of the following Category 2 and 3 materials and derived products processed in accordance with Regulation (EC) No 1069/2009 and Commission Regulation (EU) No 142/2011:

(1) biogas digestion residues and compost;

(2) ash derived from incineration, co-incineration and combustion;

(3) glycerine and other products of materials derived from the production of biodiesel and renewable fuels;

(4) pet food;

(5) feed and dog chews;

(6) hides and skins;

(7) wool and hair;

(8) feathers and down;

(9) and pig bristles.

Following long discussions with the EC since the inception of the WG, the final agreement on the interpretation of the ToR was reached by email on 25 January 2021. The scope and list of materials to be considered changed (see below).

Clarification of ToRs

Assess the requirements for alternative transformation parameters for biogas and composting plants in terms of the validation of the intended process, referred to in point 1 of Section 2 of Chapter III of Annex V to Commission Regulation (EC) No 142/2011, when applied to other derived products. In particular, the scientific opinion should comprise an assessment of the following Category 2 and 3 materials and derived products processed or obtained in accordance with Regulation (EC) No 1069/2009 and Commission Regulation (EU) No 142/2011 for the declaration of the end points in the manufacturing chain and the standard or alternative methods approved for this purpose:

(1) ash derived from incineration, co-incineration and combustion;

(2) glycerine derived from the production of biodiesel and renewable fuels;

(3) other materials derived from the production of biodiesel and renewable fuels;

(4) hides and skins;

(5) wool and hair;

(6) feathers and down;

(7) pig bristles;

(8) horns, horn products, hooves and hoof products.

Table AN.1: Protocol for the scientific assessment conducted in this scientific opinion

Step 1.1 Assessment questions	Step 1.2 Approach to be followed	Evidence needs	Step 2.1 Description of method to be used
AQ1/What are the technical parameters of the transformation processes for the declaration of the end points in the manufacturing chain, and the standard or alternative methods approved to produce derived materials or residues as described in the legislation (Com. Reg. (EU) No 142/2011) of the Category 2 and 3 materials and derived products as defined in the mandate?	Review the processing methods as described in the legislation (Com. Reg. (EU) No 142/2011) or as industrial standards or experimental trials/studies in those cases where the legislation does not provide direct information on the technical parameters used.	Details of the technical parameters in terms of time, temperature and/or pH. of the transformation processes	Two methods applied depending on the materials: • Materials for which details of the technical parameters of the transformation processes are explicit in the legislation: review of Annexes III, IV and XIII of Commission Regulation (EU) 142/2011. • Materials for which details of the technical parameters of the transformation processes are not explicit in the legislation: a*d hoc* non-systematic searches looking into scientific and grey literature. Description and presentation in tabular format of the technical parameters (treatment, temperature and/or pH, time) of the standard or alternative methods for the production of derived products or for the declaration of end points. If technical parameters are explicitly defined in the legislation, they are the intended reference for the assessment and there is no uncertainty about them. If they are not explicitly defined, there may be uncertainty about the selection of the parameters. This uncertainty will be described. The selected technical parameters will be presented in the table referred to above.
AQ2 / Is the 5 $\log_{10}$ reduction of the indicator microorganisms *Enteroccocus faecalis* (EF) and *Salmonella Senftenberg* (SS), achieved for each of the Category 2 and 3 materials and derived products, as defined in the clarification of the mandate, by the technical parameters identified in AQ1?	Literature search to extract chemical- and thermo-resistance data for EF and SS. Estimation of the level of reduction achieved for EF and SS with the standard processing parameters of each of the materials.	Evidence from peer-reviewed scientific literature about stability and inactivation of EF and SS during thermal and chemical treatments.	**1. State the main objective(s) of the question** To extract data from scientific literature about thermal and chemical inactivation of EF and SS in the form of time/temperature-pH combinations in defined matrices (even if different from the ones in the mandate). **2. Definition of the eligibility criteria for study selection (i.e. evidence needs)** Experimental studies in which heat resistance parameters (D and/or Z-values) or levels of reduction or inactivation of EF and/or SS (preferably measured in log10) have been measured after thermal and/or chemical treatment in different matrices, preferably similar to the ones included in the mandate. - Database: Scopus - English - Worldwide - Years: not restricted. **3. Definition of the search strategy (only for literature-based approaches).**

The search strings have been designed by combining the generic names of biological hazards (SS and EF) AND (inactivation method AND inactivation).

In the title, abstract or keywords: specific name of a hazard (indicator pathogen) and inactivation/resistance keywords are mentioned.
Retrieval of full text for relevant articles.

Search string for *E. faecalis*
(TITLE-ABS-KEY ("Enterococcus faecalis" OR "E. faecalis" OR (enterococc* AND faecalis)) AND TITLE-ABS-KEY ("heat resistance" OR "heat inactivation" OR "thermal resistance" OR "thermal inactivation" OR "acid resistance" OR "acid inactivation" OR "alkaline resistance" OR "alkaline inactivation" OR "pH resistance" OR "pH inactivation" OR "pressure resistance" OR "pressure inactivation" OR "D-value" OR "Z-value"))

Search string for *S.* Senftenberg
(TITLE-ABS-KEY ("Salmonella Senftenberg" OR "S. Senftenberg" OR (Salmo* AND Senftenberg)) AND TITLE-ABS-KEY ("heat resistance" OR "heat inactivation" OR "thermal resistance" OR "thermal inactivation" OR "acid resistance" OR "acid inactivation" OR "alkaline resistance" OR "alkaline inactivation" OR "pH resistance" OR "pH inactivation" OR "pressure resistance" OR "pressure inactivation" OR "D-value" OR "Z-value"))

Outputs: from Database to Excel file with the following fields: Authors, Title, Year, DOI, Link and Abstract.

4. Definition of the methods for selecting studies for inclusion/exclusion
Initial selection of studies to be extracted for each of the indicator bacteria.
Screening: the selection of studies will be done by screening the title and abstract of the references extracted following the application of the search string as above. The list of references for each indicator bacteria will be screened by WG members. For each reference, there are three options
- **Yes:** it is possible to extract inactivation data by looking at the paper in full.
- **Doubtful:** it may be useful in a second round to look more in depth.
- **No:** to be discarded.

5. Definition of the methods for extracting data from included studies
Data about thermal inactivation will be extracted in tabular format with the following fields: Hazard, Strain, Species affected, Product group, Product/or medium, Treatment (heat/acid/fermentation), T (°C), D (min), mean D, SD D, and range or 95% CI, whenever available. They will be used to plot the $\log_{10}$ D-values and times for 5 $\log_{10}$ reduction against different temperatures.

			Data about chemical inactivation will be extracted in tabular format with the following fields: Matrix/Substrate, Indicator pathogen, Initial load, Treatment, Level of inactivation, Reference. Priority will be given to review papers obtained in the ELS with the view to extract data consolidated from multiple studies. **6. Definition of the methods for appraising evidence (i.e., of the methods for identifying the uncertainty in the evidence)** The obtained data from the literature will be considered by the WG and compared with the technical processes of each group as identified in AQ1. The level of reduction achieved for EF and SS with the standard processing parameters of each of the materials will be estimated. **7. Identification and analysis of uncertainties** If a statistical model is applied in the literature, or a regression model is fitted by the WG, a confidence interval will be derived to characterise the uncertainty about the $\log_{10}$ reduction obtained under conditions of the standard processing parameters. Sources of uncertainty that are not captured by the statistical model, such as the use of other products than those referred to in the ToR in experimental studies, will be listed and evaluated by the WG experts. Overall uncertainty of the probability that a 5 $\log_{10}$ reduction is achieved will be obtained from expert judgement. (see Step 2.2). Thus, each expert will indicate the judged probability that the 5 $\log_{10}$ reduction is achieved for all combinations of hazards/reference microorganisms and processes. The output will be collected in a table where quantitative uncertainty ranges will be provided.

AQ3/Which viral hazards can be intrinsically found in the Category 2 and 3 materials and derived products as defined in the clarification of the mandate?	Hazard identification using an Extensive Literature Search	Evidence from peer-reviewed scientific literature	**1. State the main objective(s) of the question**
			To identify viral hazards for humans and animals that have been isolated in the materials included in the eight groups of the mandate (intrinsic, not when they are part of the live animal or contaminate or cross-contaminate the matrix).
			
			2. Definition of the eligibility criteria for study selection (i.e., evidence needs)
			Experimental or observational studies in which the family or specific name of the virus is mentioned in relation to the materials included in the mandate (raw material)
			  - Database: Scopus
			  - English
			  - Worldwide
			  - Years: not restricted.
			
			3. Definition of the search strategy (only for literature-based approaches).

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The search strings have been designed by combining the generic names of biological hazards (virus), the matrix (material as in the mandate) and animal by-products. The latter group of terms was added to reduce the number of false positives.

The search strings are displayed in Table AN2. The initial search was designed for the identification of biological hazards including bacteria, virus, parasites, fungi and prions. Only the viral outputs were considered for AQ3

Outputs: from Database to Excel file with the following fields: Authors, Title, Year, DOI, Link and Abstract.

4. Definition of the methods for selecting studies for inclusion/exclusion
Initial selection of studies will be performed for the eight groups of the mandate.
Screening: the selection of studies will be done by screening the title and abstract of the references extracted following the application of the search string as above.
The list for each group will be screened by one WG member. For reach reference, there are three options:
- **Yes**: the name of family or specific name of the virus intrinsically present in the matrix of interest can directly be extracted from title and abstract
- **Doubtful**: it may be useful in a second round to look more in depth.
- **No**: to be discarded.
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5. Definition of the methods for extracting data from included studies
A table with the identified viral hazards will be produced with the following fields:
material (Category 2 and 3 material or derived product), group ((non-)enveloped, DNA/RNA), viral hazard, family of the viral hazard, (main) species affected, and reference/s.
Based on expert knowledge of the Working Group members, additional virus not extracted via the ELS and for which there is strong robust evidence (scientific publications) will be added.

6. Definition of the methods for appraising evidence (i.e., of the methods for identifying the uncertainty in the evidence)
The obtained data from the literature will be considered by the WG. When enough information is available of the intrinsic presence of the virus in the materials of each group, the name and the family of the virus will be extracted and tabulated.

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<tr><td>**AQ4/Is the 3 log$_{10}$ reduction of the selected thermoresistant**</td><td>Literature search to extract chemical- and thermo-resistance data of a subset of</td><td>Evidence from peer-reviewed scientific literature</td><td>

1. State the main objective(s) of the question
To extract data from scientific literature about thermal and chemical inactivation of the selected viruses in the form of time/temperature/pH combinations in defined matrices (even if different from the ones in the mandate).

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viruses, achieved for each of the Category 2 and 3 materials and derived products, as defined in the clarification of the mandate, by the technical parameters identified in AQ1?	viruses identified in AQ3 based on the criteria for thermo- and chemical-resistance (see point 1). Estimation of the level of reduction achieved for the relevant viruses with the standard processing parameters of each of the materials.	about stability during thermal and chemical treatment of the identified non-enveloped viruses in AQ3	Only non-enveloped viruses that may be intrinsically present in the materials will be selected as the most resistant to thermal and other treatments for each group. Enveloped viruses identified as intrinsic viral hazards will be disregarded, as they are not considered to be resistant to thermal and chemical treatments, or less resistant than non-enveloped viruses. **2. Definition of the eligibility criteria for study selection (i.e., evidence needs)** Experimental studies in which heat resistance parameters (D and/or Z-values) or the levels of reduction or inactivation of the selected viruses (preferably measured in $\log_{10}$) have been measured after thermal and/or chemical treatment in matrices, preferably similar to the ones included in the mandate. • Database: Scopus • English • Worldwide • Years: not restricted. **3. Definition of the search strategy (only for literature-based approaches).** The search strings have been designed by combining the generic names of biological hazards (selected viruses) AND (inactivation method) AND (inactivation). In the title, abstract or keywords (TITLE-ABS-KEY): specific name of a hazard (indicator pathogen) and inactivation/resistance keywords are mentioned. Retrieval of full text for relevant articles. The search strings applied in this ELS, based on the outputs of the ELS conducted for AQ3, will be conducted using the following generic terms: AND TITLE-ABS-KEY ("heat resistance" OR "heat inactivation" OR "thermal resistance" OR "thermal inactivation" OR "acid resistance" OR "acid inactivation" OR "alkaline resistance" OR "alkaline inactivation" OR "pH resistance" OR "pH inactivation" OR "pressure resistance" OR "pressure inactivation" OR "D-value" OR "Z-value" OR "lime" OR "liming ")) To this string, the outputs of AQ3 will be added joined by the Boolean term AND Sample Search String for identified viral hazards (OUTPUTS OF ELS FOR AQ3 ADDED A POSTERIORI) bovine papillomavirus + cottontail rabbit papillomavirus (TITLE-ABS-KEY ("papillomavirus" OR "papillomaviridae") swine vesicular disease virus

(TITLE-ABS-KEY ("swine vesicular disease virus" OR "swine vesicular disease" OR "porcine enterovirus" OR enterovirus OR picornaviridae)

senecavirus A
(TITLE-ABS-KEY ("senecavirus A" OR "SVA" OR senecavirus OR picornaviridae)

ungulate tetraparvovirus
(TITLE-ABS-KEY (parvovirus OR parvoviridae)

chicken anemia virus
(TITLE-ABS-KEY ("chicken anemia virus" OR "CAV" OR "chicken infectious anemia" OR gyrovirus OR anelloviridae)

duck circovirus
(TITLE-ABS-KEY ("duck circovirus" OR "DuCV" OR circovirus OR circoviridae)

bluetongue virus
(TITLE-ABS-KEY ("bluetongue virus" OR "BTV" OR "bluetongue disease" OR orbivirus OR reoviridae)

4. Definition of the methods for selecting studies for inclusion/exclusion
Initial selection of studies to be extracted for each of the selected viruses or group of viruses
Screening: the selection of studies will be done by screening the title and abstract of the references extracted following the application of the search string as above.

The list of references for each selected virus will be screened by one WG member. For reach reference, there are three options
- **Yes:** it is possible to extract inactivation data by looking at the paper in full
- **Doubtful:** it may be useful in a second round to look more in depth.
- **No:** to be discarded

Outputs: from Database to Excel file with the following fields: Authors, Title, Year, DOI, Link and Abstract.

5. Definition of the methods for extracting data from included studies
Only data on the preselected non-enveloped viruses will be extracted. Data about thermal inactivation will be extracted in tabular format with the following fields: hazard, product group, product/or medium, treatment, pH, T (°C), D (min), 5D (time to achieve 5 $\log_{10}$ reduction) and reference. For those viruses

with enough data, they will be used to plot the $\log_{10}$ D-values and times for 3 $\log_{10}$ reduction against different temperatures.

Data about chemical inactivation will be extracted in tabular format with the following fields: matrix/substrate, indicator pathogen, initial load, treatment, level of inactivation, reference.

Priority will be given to review papers obtained in the ELS with the view to extract data consolidated from multiple studies.

6. Definition of the methods for appraising evidence (i.e. of the methods for identifying the uncertainty in the evidence)

The obtained data from the literature will be considered by the WG and compared with the technical processes of each group as identified in AQ1. The level of reduction achieved for each of the viral hazards with the standard processing parameters of each of the materials will be estimated.

7. Identification and analysis of uncertainties

If a statistical model is applied in the literature, or a regression model is fitted by the WG, a confidence interval will be derived to characterise the uncertainty about the $\log_{10}$ reduction obtained under conditions of the standard processing parameters.

Sources of uncertainty that are not captured by the statistical model, such as the use of other products than those referred to in the ToR in experimental studies, will be listed and evaluated by the WG experts.

Overall uncertainty of the probability that a 3 $\log_{10}$ reduction is achieved will be obtained from expert judgement (described in step 2.2). Thus, each expert will indicate the judged probability that the 3 $\log_{10}$ reduction is achieved for all combinations of viral hazards and processes. The output will be collected in a table where, ideally, quantitative uncertainty ranges will be provided.

| AQ5/Is the 3 $\log_{10}$ reduction of eggs of *Ascaris* sp. achieved for each of the Category 2 and 3 materials and derived products, as defined in the clarification of the mandate, by the technical parameters identified in AQ1 for the processes based on chemical treatments (group 4 - hides and skins; group 5 - wool and hair)? | Literature search to extract chemical resistance data for eggs of *Ascaris* sp.

Estimation of the level of reduction achieved for eggs of *Ascaris* sp. with the standard processing parameters of each of the materials. | Evidence from peer-reviewed scientific literature about inactivation during chemical treatments of eggs of *Ascaris* sp. | **1. State the main objective(s) of the question**
To extract data from scientific literature about chemical inactivation of *Ascaris* sp. in the form of time/temperature/pH combinations in defined matrices (even if different from the ones in the mandate).

2. Definition of the eligibility criteria for study selection (i.e. evidence needs)
Experimental studies in which the levels of reduction or inactivation of Ascaris spp. (preferably measured in $\log_{10}$) have been measured after chemical treatment in different matrices, preferably similar to the ones included in the mandate.
- Database: Scopus
- English
- Worldwide
- Years: not restricted.

3. Definition of the search strategy (only for literature-based approaches).
The search strings have been designed by combining the generic names of biological hazards (*Ascaris* spp.) AND (inactivation method) AND (inactivation).

In the title, abstract or keywords: specific name of the hazard (*Ascaris* ssp.) and inactivation/resistance keywords are mentioned
Retrieval of full text for relevant articles

The search string used for this ELS will be as follows:
(TITLE-ABS-KEY (ascaris) AND TITLE-ABS-KEY ("acid resistance" OR "acid inactivation" OR "alkaline resistance" OR "alkaline inactivation" OR "lime" OR "liming"))

Outputs: from Database to Excel file with the following fields: Authors, Title, Year, DOI, Link and Abstract.

4. Definition of the methods for selecting studies for inclusion/exclusion
Screening: the selection of studies will be done by screening the title and abstract of the references extracted following the application of the search string as above. The list of references will be screened by one WG member. For reach reference, there are three options
- **Yes:** it is possible to extract inactivation data by looking at the paper in full
- **Doubtful:** it may be useful in a second round to look more in depth.
- **No:** to be discarded

5. Definition of the methods for extracting data from included studies |

		Data about chemical inactivation will be extracted in tabular format with the following fields: matrix/substrate, indicator pathogen, initial load, treatment, level of inactivation, reference. Priority will be given to review papers obtained in the ELS with the view to extract data consolidated from multiple studies
		6. Definition of the methods for appraising evidence (i.e. of the methods for identifying the uncertainty in the evidence)
		The obtained data from the literature will be considered by the WG and compared with the technical processes of each group as identified in AQ1. The level of reduction achieved for *Ascaris* spp. with the standard processing parameters of each of the materials will be estimated.
		7. Identification and analysis of uncertainties
		If a statistical model is applied in the literature, a confidence interval will be derived to characterise the uncertainty about the $\log_{10}$ reduction obtained under conditions of the standard processing parameters.
		Sources of uncertainty that are not captured by the statistical model, such as the use of other products than those referred to in the ToR in experimental studies, will be listed and evaluated by the WG experts.
		Overall uncertainty of the probability that a 3 $\log_{10}$ reduction is achieved will be obtained from expert judgement. (see Step 2.2)

Step 2.2: Integration of evidence across questions and remaining overall uncertainty

ToRs as clarified	Integration of evidence between questions	Addressing overall uncertainty
ToR 1	For each of the AQ a body of evidence will be built that summarises the literature (data and models; sources and	AQ 2, 4 and 5 require an evaluation of the question whether a predefined level of $\log_{10}$ reductions is achieved for the indicator bacteria, thermoresistant viruses and eggs of *Ascaris* sp., by the standard processes applied to the listed materials and derived products. For this purpose, evidence on inactivation dynamics of the indicator pathogens, processing parameters, and the specific characteristics of the standard processes applied to the listed materials and derived products will be collected. Also, sources of uncertainty will be identified and summarised. As a final step, following EFSA's uncertainty guidelines (EFSA Scientific Committee, 2018a and 2018b), an expert knowledge elicitation (EKE) procedure will be performed to answer the AQs, based on the collected evidence and indicated uncertainties. The EKE will be performed for AQ 2, 4 and 5 on the basis of:

| | conclusions) for each of the materials and derived products listed in the ToR. | - The body of evidence for each AQ
- Data analysis done for each AQ
- The listed uncertainties

As a first step, the AQ will be translated into EKE questions. In the EKE, the experts will be requested to express the uncertainty about their answer, that is how sure they are that the specified $\log_{10}$ reductions are achieved. In line with the guidelines, these uncertainties will be expressed quantitatively, as probabilities. The EKE questions read:
  • What is the probability that a 5 $\log_{10}$ reduction of *Enterococcus faecalis* is achieved at least in 99% of cases, by application of the relevant process/es, assuming that the process/es is/are performed as prescribed and that the indicated process conditions are achieved?
  • What is the probability that a 5 $\log_{10}$ reduction of *S.* Senftenberg (775 W, H2S negative) is achieved at least in 99% of cases, by application of relevant process/es, assuming that the process/es is/are performed as prescribed and that the indicated process conditions are achieved?
  • What is the probability that a 3 $\log_{10}$ reduction of parvovirus or the identified most resistant viruses is achieved in at least 99% of cases, by application of the relevant process/es, assuming that the process/es is/are performed as prescribed and that the indicated process conditions are achieved?
  • What is the probability that a 3 $\log_{10}$ (99%) reduction of eggs of *Ascaris* sp. is achieved in at least 99% of cases, by application of the relevant chemical process/es, assuming that the process/es is/are performed as prescribed and that the indicated process conditions are achieved?

In principle, the transformation processes for the declaration of the end points in the manufacturing chain, and the standard or alternative methods approved to produce derived materials or residues as described in the legislation (Com. Reg. (EU) 142/2011) will be considered and therefore the potential variability in performance of the processes under practical conditions (which includes, for example, human error) will not be estimated when answering the AQs. To prevent the situation where conclusions are misinterpreted, the potential for accidental deviations from the standard processing will be referred to by the phrase 'in at least 99% of cases'.

The EKE procedure will be performed in two steps. In both steps, the expert judgements will be made by members of the EFSA Working Group and EFSA staff that will be involved in the drafting of this scientific opinion. First, after a short training, individual experts will be asked to indicate the subjective probability range that reflects their uncertainty about achieving the indicated $\log_{10}$ reduction, for all combinations of microorganisms and processed materials. This will be done without consulting other experts, on the basis of the collected evidence, including the draft opinion and uncertainty table. To facilitate the process, experts will be encouraged to use the subjective probability ranges as described in the EFSA Uncertainty guidelines. Next, the individual judgements will be collected and presented in a meeting where all experts will be present. At this meeting, differences in judgements will be discussed and consensus judgements obtained. |

Table AN2: Search string for AQ3

Set	Search terms
5	#4 AND (LIMIT-TO (LANGUAGE , "English") OR LIMIT-TO (LANGUAGE , "Undefined"))
4	#1 AND #2 AND #3
3	TITLE-ABS-KEY (abp OR apbs OR "by product" OR "by products" OR byproduct OR byproducts OR derived OR "sub product" OR "sub products" OR subproduct OR subproducts OR (("category 2" OR "category 3") W/3 material*) OR (animal* W/3 waste))
2	TITLE-ABS-KEY (virus* OR viral OR adenovir* OR "Bovine viral diarrhea virus 2" OR "Bovine viral diarrhea virus type 2" OR bvdv2 OR "BVDV 2" OR "BVDV Type 2" OR "Swine Fever Virus*" OR "Cholera hog virus*" OR "hog cholera virus*" OR coxsackievirus* OR echovirus* OR enterovirus* OR "Foot and mouth disease*" OR "FMD virus*" OR hepatitis OR influenza* OR "lumpy skin disease*" OR "Neethling virus*" OR "marek disease*" OR "mareks disease*" OR "marek's disease*" OR " Fowl Paralys*" OR "Newcastle disease*" OR "Avian Paramyxovirus 1" OR norovirus* OR "Norwalk virus*" OR "Norwalk like virus*" OR parvovirus* OR pestivirus* OR reovir* OR capripoxvirus* OR ((sheep OR goat) W/3 pox) OR "Sheeppox virus*" OR "Sheep Pox Virus*" OR "Goatpox virus*" OR "Goat Pox Virus*" OR rotavirus* OR "Swine Vesicular Disease*" OR "SVD virus*")
1	Ash TITLE-ABS-KEY ((ash OR ashes) AND (coincineration* OR co-incineration OR incineration* OR combustion*)) Glycerine derived from the production of biodiesel and renewable fuels TITLE-ABS-KEY ((glycerine OR glicerine) Other products of materials derived from the production of biodiesel and renewable fuels TITLE-ABS-KEY ((water OR (derived W/3 product*) OR residue* OR material OR materials OR "potassium sulphate" OR (bleach* W/3 clay) OR sludge) AND (biodiesel* OR "bio diesel*" OR "renewable fuel*" OR esterification OR transesterification OR tallow) Hides and skins TITLE-ABS-KEY((cattle OR bovin* OR cow OR cows OR "Bos taurus" OR ruminant* OR goat OR goats OR capra OR sheep OR sheeps OR ovis OR pig OR pigs OR hog OR hogs OR chicken OR chickens OR fowl OR fowls OR "gallus gallus" OR poultry OR turkey OR turkeys OR meleagris OR swine OR "sus scrofa" OR fish OR tilapia OR tuna OR ungulat* OR horse or donkey OR mule* OR camel OR lama OR llama or alpaca OR ostrich OR deer OR reindeer OR rabbit OR hare) W/10 (hide OR hides OR skin OR skins)) Hair and wool TITLE-ABS-KEY ((wool OR hair OR hairs) W/10 (cattle OR bovin* OR cow OR cows OR "Bos taurus" OR ruminant* OR goat OR goats OR capra OR sheep OR sheeps OR ovis OR ox OR oxen OR "Oryctolagus cuniculus" OR rabbit* OR hare OR hares OR equus OR horse OR horses OR donkey* OR "guinea pig" OR "guinea pigs" OR guineapig* OR "cavia porcellus" OR lama OR llama OR llamas OR alpaca OR alpacas OR camel* OR mule OR mules OR deer OR moose OR elk OR elks OR "alces alces" OR reindeer)) Feathers TITLE-ABS-KEY ((feather OR feathers OR plumage) OR (downs AND (bird OR birds OR ave OR aves OR avian OR poultry)))

Pig bristles
TITLE-ABS-KEY ((bristle* OR hair OR hairs) W/10 (hog OR hogs OR pig OR pigs OR swine OR "sus scrofa"))

Horns and Hooves
TITLE-ABS-
KEY ((cattle OR bovin* OR cow OR cows OR "Bostaurus" OR ruminant* OR buffalo OR bull OR bulls OR goat OR goats OR capra OR sheep OR she
eps OR ovis OR cervidae OR deer OR reindeer* OR "alce alces" OR elk OR elks OR moose) AND (antler OR antlers OR horn OR horns))