Directorate-General for Agriculture
and Rural Development

Expert Group for Technical Advice on Organic Production

EGTOP

FINAL

REPORT

On

The EGTOP adopted this technical advice at the2nd plenary meeting
of the permanent group, 6-8 June 2018

About the setting up of an independent expert panel for technical advice

With the Communication from the Commission to the Council and to the European Parliament on a European action plan for organic food and farming adopted in June 2004, the Commission intended to assess the situation and to lay down the basis for policy development, thereby providing an overall strategic vision for the contribution of organic farming to the common agricultural policy. In particular, the European action plan for organic food and farming recommends, in action 11, establishing an independent expert panel for technical advice. The Commission may need technical advice to decide on the authorisation of the use of products, substances and techniques in organic farming and processing, to develop or improve organic production rules and, more in general, for any other matter relating to the area of organic production. By Commission Decision 2009/427/EC of 3 June 2009, the Commission set up the Expert Group for Technical Advice on Organic Production.

EGTOP
The Group shall provide technical advice on any matter relating to the area of organic production and in particular it must assist the Commission in evaluating products, substances and techniques which can be used in organic production, improving existing rules and developing new production rules and in bringing about an exchange of experience and good practices in the field of organic production.

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The report of the Expert Group presents the views of the independent experts who are members of the Group. They do not necessarily reflect the views of the European Commission. The reports are published by the European Commission in their original language only.

http://ec.europa.eu/agriculture/organic/home_en

ACKNOWLEDGMENTS

Members of the Group are acknowledged for their valuable contribution to this technical advice. The members are:

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None.

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All declarations of interest of Permanent Group members are available at the following webpage:

http://ec.europa.eu/agriculture/organic/home_en

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EXECUTIVE SUMMARY

For the substances requested in the mandate, the Group discussed whether their use is in line with the objectives and principles of organic production, and whether they should therefore be included in Annex I of Reg. 889/2008. It concluded the following:

Biochar should be included in Annex I, with the following restriction(s): (1) Only from plants materials which have not been treated after harvest; (2) the Group recommends a threshold value of 4 mg polycyclic aromatic hydro-carbons (PAHs) per kg dry matter (DM). This value should be evaluated every second year; (3) All relevant contaminants must be monitored; (4) The risk management should consider the amounts of biochar used per surface area, and the cumulative effects of multiple applications.

The Group strongly recommends that the entry for **calcium carbonate** is harmonized in all language versions. The Group recommends that it should read: Calcium carbonate (for instance: chalk, marl, ground limestone, Breton ameliorant, (maerl), phosphate chalk).

Mussel waste and similar materials should be authorized. The Group recommends adding two new entries to the list of authorized animal by-products as follows: (1) mollusc waste; (2) egg shells (not from factory farming origin).

With respect to the request on structure liming, **calcium oxide and calcium hydroxide** should not be included in Annex I.

Regarding **oil shale ash**, the Group cannot take a decision due to missing of detailed information on possible contaminants.

Humic and fulvic acids should be included in Annex I with the following restriction: 'only if obtained by inorganic salts/solutions excluding ammonium salts, or from drinking water purification'.

Stripped nitrogen should not be included in Annex I.

Regarding the **nutrition of micro-algae**, the Group express the need of different expertise and decides to transfer the application to a subgroup meeting on aquaculture in 2018 or 2019.

Other two issues were raised by the group:
1) there are widespread concerns (also among consumers) about the potential **presence of contaminants,** such as antibiotic and other veterinary medical products, hormones, antibiotic-resistant bacteria, heavy metals in animal and plant-based nutrients from conventional origin. The Group recommends that when research results on these aspects are available, they should be considered in future evaluations of amendments.
2) the group recommends to harmonize the official definitions of "**factory farming**" as the present the situation is unfair due to the fact that certain fertilizers can be used in some Mss and not in others.

1. BACKGROUND

“In recent years, several Member States have submitted dossiers under the second subparagraph of Article 21(2) of Regulation (EC) No 834/2007 concerning the possible inclusion, deletion or change of conditions of use of a number of substances in Annex I to Regulation (EC) No 889/2008, or more generally, on their compliance with the abovementioned legislation. Furthermore, several Member States have also requested an evaluation of some techniques used in fertilizer production in terms of their usefulness to and compliance with the EU organic farming legislation. Therefore, the Group is requested to prepare a report with technical advice on the matters included in the terms of reference.”

2. TERMS OF REFERENCE

In light of the most recent technical and scientific information available to the experts, the Group is requested to answer if the use of the below listed substances are in line with the objectives, criteria and principles as well as the general rules laid down in Council Regulation (EC) No 834/2007 and, hence, can be authorised to be used in organic production under the EU organic legislation.

Substances:

- Biochar – soil conditioner (AT) EN translation uploaded
- Structure liming (SE)- is this in line with the principle in article 4 (b) (iii) of Regulation (EC) No 834/2007"only low solubility fertilisers".
- Mussel waste (SE)
- Leonardite and potassium bicarbonate (IT)
- Nitrogen and phosphorus of organic (animal) origin and highly soluble only for organic cultivation of algae (Spiruline) (FR)

The Commission would also like to get the **additional clarification** from the group as regards the following:

- In view of the SE concern with using animal by-products as bio-fertilisers the Commission would like to have the opinion of the group; Clarification needed about the "sanitary reasons" mentioned in the report.
- Leonardite (CZ) is the issue to be reopened? Clarification needed on the statement from EGTOP that "not enough data are available so the product could not be evaluated" contrasting with the recommendation that "this is just another form of Leonardite which is already authorised". Clarity is also needed about the principle of low solubility: with in article 4(b)(iii) of Regulation (EC) No 834/2007 "only low solubility fertilisers". Liquid Leonardite seems highly soluble.

For the preparation of its report the group is invited to examine technical dossiers provided to the Commission by the Member States and suggest amendments to the current list in Annex I of the Regulation 889/2008.

CONSIDERATIONS AND CONCLUSIONS

3.1 Biochar

Introduction, scope of this chapter

Biochar is a pyrolysis product. The terminology for such products is not harmonized – especially not between different languages. The differences relate to elements of production as well as elements of use. The Group distinguishes two major denominations:

- Charcoal: pyrolysis product made from wood and used as fuel
- Biochar: pyrolysis product made from a wide variety of organic materials of plant or animal origin and applied to soil and/or given to animals (feed additive).

Consistent with the mandate, the Group restricts its evaluation to biochar made from plants or wood for application to the soil. However, it points out that biochar could potentially be made from other materials. Research on biochar is still in its infancy and its multiple effects are far from being fully understood. For more thorough information, the reader may consult the reviews written by Atkinson *et* al. (2010), Sohi *et* al. (2010), Verheijen *et* al. (2010), Lehmann *et* al. (2011), Gurwick *et* al. (2013), Nartey and Zhao (2014), Teichmann (2014), Lone *et* al. (2015) and Gluszek *et* al. (2017). It is traditionally used in South America (see below).

Authorization in general production

The EU fertilizer legislation does not cover biochar at the moment. However, it is currently under revision and there is an intention to cover biochar in the future. Meanwhile, biochar is covered by national legislation, at least in several member states. Some EU member states have authorised biochar for general agriculture and usually, the national legislation includes requirements concerning the presence of contaminants (see Environmental issues below).

Authorization in organic production

Biochar is not mentioned in Annex I of Reg. 889/2008. In the second report on fertilisers and soil conditioners (chapter 4.8.3), EGTOP stated the following: «As regards pyrolysis, the Group agrees with the use of this method, but is concerned about the potential negative side effects […] as a consequence of the mismanagement of the process. For this reason, products obtained from pyrolysis should not automatically be approved but a dossier should be submitted for evaluation».

Various countries have different interpretations whether biochar (CAS nr. 7440/44/DO) is authorized in organic production:

- Some member states consider that biochar is not mentioned in Annex I and therefore prohibited.
- At least one authority considers (or at least has done so in the past) that biochar is equivalent to wood ash, and therefore authorised.
- Some member states consider that biochar is acceptable for organic farming, but that only commercial products which are approved under general legislation may be used.
- Switzerland has included biochar in the Annex of fertilizers authorized in organic production. There is an explicit restriction that only commercial products which are approved under general legislation may be used.

Agronomic use, technological or physiological functionality for the intended use

The application of biochar to soil is seen as a method for carbon sequestration. This is in line with current efforts for climate protection, even if the Group doubts about the quantitative impact at a global scale (see section Environment below). In addition, biochar has been reported to positively impact an array of soil processes ranging from benefiting soil biology indirectly, controlling soil-borne pathogens, enhancing nitrogen fixation, improving soil physical and chemical properties, decreasing nitrate leaching and nitrous oxide emission to remediation of contaminated soils (L*one et* al., 2015). Many of these functions can be attributed to the porous structure of biochar and to its high cation exchange capacity. Although this is an impressive list of potential functions, the Group emphasizes that these effects do not occur under all circumstances and are not always pronounced. They vary with the type of biochar used, the amount, as well as with the soil type and soil conditions. A critical review found a «small overall, but statistically significant, positive effect of biochar application to soils on plant productivity in the majority of cases» (Verhei*jen et* al., 2010). In summary, the effects of biochar should be seen mainly in the contexts of soil fertility and carbon sequestration.

Biochar may be applied directly to the soil (i.e. as a soil conditioner), but it may also be added to manure and slurry, in which case it should be considered a fertiliser additive. Other applications, e.g. as a compost additive or as a feed, have also been proposed. Due to its stability, biochar will end up in the soil in all cases. The minimum,

optimum and maximum doses are not known. In the literature, application rates in the range of 10 – 100 t/ha of carbon are often reported (Verhei*jen et* al., 2010). Once applied to the soil, biochar will remain there for a long time, up to hundreds or thousands of years (Verhei*jen et* al., 2010).
The principles of organic farming state that soil fertility should be based on a 'living soil', that means by enhancing soil microbial activity. It is unsure how much, or if biochar contributes to a living soil, but there are no references of negative influences reported.
In addition, biochar can be used as plant protection applied as emulsion, for disease and pest control. This field is beyond this request for application, and therefore not taken in account.

Necessity for intended use, known alternatives
Biochar is used for carbon sequestration, for soil remediation and as a soil conditioner. There are numerous other methods and inputs (leonarditis included) which also influence soil fertility and/or greenhouse gas emissions. There is a wide-spread belief (not fully supported by the Group) that the use of biochar is environmentally beneficial. Thus, there is a "political necessity" for clarifying the impact and harmonising the use of biochar in organic farming.

Origin of raw materials, methods of manufacture
Biochar can be made from a variety of plant materials such as wood, straw, leaves or by-products from food production (e.g. oil press cake). It is also possible to make biochar from animal products (manure) and animal by-products, as well as wastes (e.g. municipal wastes). However, biochar from animal origin and from waste products is excluded from this evaluation.
Pyrolysis takes place at temperatures between 200 and 900 °C, under exclusion of oxygen. The process sets energy free, which can be used for pyrolysis. Thus, production of biochar does not require external energy.
There are large-scale production plants which manufacture and sell biochar. In addition, there are also small-scale production plants which are sold to farmers for manufacturing their own biochar on-farm.

Environmental issues, use of resources, recycling
Management of degraded soils: The application of biochar to the soil can be a methodology to enhance structure building and water retention and thus initiates re-cultivation of biologically inactive soils in preparing a better environment for soil biology. Biochar binds heavy metals and organic pollutants (Nartey and Zhao, 2014), and can thus be used to protect groundwater and crops. However, it does not remove the toxins from the soil, therefore it is not a method for chemical soil remediation.
Climate protection: The use of biochar is proposed as a method for carbon sequestration ('carbon sink'). Obviously, the effect depends on the stability of biochar in the soil, and of the quantities applied. A critical review (Gurw*ick et* al., 2013) screened a large number of publications (>300) and concluded that there is insufficient empirical evidence to support the alleged claims for mitigation of climate change. To have an impact on the climate, huge quantities of biochar would need to be used. A model calculation concluded that approximately 1 % of the greenhouse gas reduction target for Germany for the year 2030 could be achieved by producing biochar. For this, however, all available biomass would need to be manufactured into biochar (Teichmann, 2014). Thus, biochar has a very limited potential for climate protection in the Group's opinion.
Soil pollution: if the pyrolysis process is poorly managed, polycyclic aromatic hydrocarbons (PAHs) are formed, and will be present in the biochar as contaminants. Compliance with maximum limits for PAHs is one of the main requirements of fertilizer approval for biochar. As long as approved products are used, the Group is not concerned over pollution with PAHs. However, the use of non-approved products could present a risk of soil contamination. The Group recommends that all biochar processes and products (including on-farm production facilities) should undergo sufficient controls to safeguard that they respect the limits for PAHs. The European Biochar Certificate recognizes two purity levels with respect to PAHs: for the basic level, a threshold value of 12 mg/kg is applied while for 'premium products', a threshold of 4 mg/kg DM is applied (EBC, 2012).
As long as plants or untreated wood are used as feedstock for biochar production, the Group is not concerned about contaminants other than PAHs. However, the Group points out that if other materials such as municipal wastes were used, other pollutants could also occur (e.g. heavy metals, dioxins, PCBs).

The impacts of biochar on earthworms and other soil fauna are not well studied, Conti et al., 2016 suggests some effect on micro-arthropods, but based on the current knowledge, however, as reviewed by Lehm*ann et* al. (2011), the Group can accept the use.

Animal welfare issues
No known issues.

Human health issues
Biochar is not toxic, but it may form dust during application. If appropriate personal protective equipment is used during application, the Group is not concerned over human health effects.

Food quality and authenticity
The Group is not aware of any effects of biochar on food quality.

Traditional use and precedents in organic production
Biochar has long been used thousands of years ago in traditional agricultural systems of the Central Amazon, resulting in soils known as *terra preta* (S*ohi et* al., 2010).

Authorised use in organic farming outside the EU / international harmonization of organic farming standards
'Wood charcoal' is authorized as a fertiliser by the Codex Alimentarius guideline for the production, processing, labelling and marketing of organically produced food (edition 2013) and by the IFOAM Norms for Organic Production and Processing (edition 2014). In the USA, biochar from untreated plant or animal material (except from manure) is allowed under the National Organic Program (NOP).

Other relevant issues
None.

Reflections of the Group / Balancing of arguments in the light of organic production principles
Due to the stability of biochar, applications to the soil are almost irreversible, and should therefore be evaluated with the necessary care. In the Group's opinion, the positive properties of biochar are not well documented (soil conditioner effects as well as carbon sequestration). However, the Group is confident that biochar has at least some beneficial effects on the soil and for carbon sequestration.
The principles of organic farming state that soil fertility should be based on a 'living soil', that means by enhancing soil microbial activity. Consequently, the majority of fertilisers used in organic farming are feeding soil micro-organisms. By contrast, biochar does not directly feed soil organisms.
There are alternative ways of recycling organic materials, such as composting. If biochar were applied at a large scale (as it would be necessary for having an impact on climate), the use of biomass for biochar production would compete with the traditional uses of biomass (e.g. for composting) and other plant residues (straw), which are necessary for building up humus. The Group reports that composted material has beneficial effects on the soil, and in specific cases can be more effective in comparison with biochar. (Montemurro, 2010; Ingham, 2006)
The Group is concerned about the potential presence of contaminants such as PAHs, dioxins and PCBs, and thinks that these must be limited to the lowest possible values, based on best available technology solutions. In addition, all relevant contaminants should be monitored in biochar products, commercially available and farm-made products alike. The risk management should also consider the amounts of biochar used per surface area, and the cumulative effects of multiple applications. Finally, only plants materials should be used, and they should not have been treated after harvest. Currently, biochar is regulated at national level, and therefore contaminants have to comply with national threshold values. Unfortunately, there are almost no thresholds for PAHs and PCBs defined for organic manure, except sewage sludge. The Group would like to see a uniform threshold value applied in the EU. However, the Group recommends that a final decision is taken only when the revision of the EU fertilizer legislation is completed. For the transitional period, the Group could imagine that a threshold value of 4 mg/kg DM (corresponding to the 'premium level' of the European Biochar Certificate) is applied.
The Group emphasizes that biochar is different from wood ash. Biochar is produced by pyrolysis (in the absence of oxygen), while ash is produced by combustion, in the presence of oxygen. Also, biochar is much more stable than ash. The Group has not evaluated biochar from animal origin and municipal wastes. In the case of municipal wastes, the Group would be concerned about the presence of other kinds of contaminants, in addition to those which might be present in all biochar products.

Conclusions
The groups doesn't see the necessity of biochar use in organic farming, but cannot find strong evidence against the application in soil, if the contaminants risks are handled as proposed below.

In the Group's opinion, the use of biochar is in line with the objectives, criteria and principles of organic farming as laid down in Council Regulation (EC) No 834/2007 under certain conditions. It should therefore be included in Annex I, with the following restriction(s): 1) Only from plants materials which have not been chemically treated in the production process or after harvest.2) threshold value of 4 mg PAHs/kg DM.

A specific sampling and analysis plan to monitor and quantify contaminants presence with respect of thresholds has to be defined, also considering the amounts used per area and cumulative effects.

The group thinks that horizontal EU regulation on biochar production and use should be develop and recommends that a research project to define scientifically based features of the regulation is considered. Long term effect and cumulative effects should be considered.

3.2 Liming materials

Liming is the application of calcium- and magnesium-rich materials to soil.

Note: liming materials are different from calcium fertilisers (e.g. calcium chloride), which are applied to the foliage of apple trees against calcium deficit. This section deals only with liming materials, and not with calcium fertilisers.

3.2.1 Introductory comments on the current authorisation of calcium carbonate

In the old organic regulation (Reg. 2092/91; final version from December 2007), there was a listing 'Calcium carbonate of natural origin (for instance: chalk, marl, ground limestone, Breton ameliorant (maërl), phosphate chalk)'.

When this listing was transferred to the new organic regulation (Reg. 889/2008; first version from September 2008), the expression 'for instance' was eliminated and the new listing now reads 'Calcium carbonate of natural origin (chalk, marl, ground limestone, Breton ameliorant (maërl), phosphate chalk)' with the restriction 'Only of natural origin'. This change is directly relevant for the authorisation of mussel waste (see next section). However, the Group is not aware that there was a debate about such materials, or an intention to limit them.

The Group further noted that this change was made in the English version of Reg. 889/2008. However, it was not made in the German version, where 'for instance' is still into force. Again, this is directly relevant for the authorisation of mussel waste. It means that mussel waste is authorised under the German version, but not under the English version. Note: The Group did not systematically check all language versions.

Conclusions

The Group strongly recommends that the entry for calcium carbonate is harmonized in all language versions. In the Group's opinion, the original version from Reg. 2092/91 (with 'for instance') is preferable. It reflects the intention of the organic principles well, and it provides some flexibility for using locally available materials. Thus, the entry should read: Calcium carbonate (for instance: chalk, marl, ground limestone, Breton ameliorant, (maerl), phosphate chalk).

3.2.2 Mussel waste and similar materials

Introduction, scope of this chapter
The Group was asked to evaluate the use of 'residues from the production of mussels including oysters' as fertilisers. The Group highlights that other mollusc shells and egg shells might be used for the same purpose, and the same reflections would also apply to these materials.

Authorization in general production and in organic production
Mussel waste is not specifically mentioned in the EU fertilizer legislation 2003/2003. Its use is subject to the sanitary requirements defined in Regulation (EC) No 1069/2009 and Regulation (EU) No 142/2011.
In Annex I of Reg. 889/2008, mussel waste is not explicitly mentioned, but it can be part of biogas digestate and would be authorized for organic production in that case.

Agronomic use, technological or physiological functionality for the intended use
Mussel waste contains shells (mainly calcium carbonate) along with various amounts of flesh, depending on the origin of the material and the processing method. Thus, it has a double use as a liming material and as a multi-nutrient fertilizer. Due to the high content in calcium carbonate, the Group has placed mussel waste in the chapter of liming materials. However, mussel waste is also like animal by-products and could as well be considered in that context. As slaughterhouse waste, it needs sanitization and stabilization procedures defined in Regulation (EC) No 1069/2009 and Regulation (EU) No 142/2011.

Necessity for intended use, known alternatives
Other products are already authorized for liming and with similar properties as fertilizers, anyhow mussel waste could be an option as it is a side products otherwise lost from the nutrients cycle.

Origin of raw materials, methods of manufacture
The dossier deals only with mussel waste as a raw material and as it contains not only shells, but also flesh it will decay rapidly, leading to a strong smell and potential microbial contamination, which necessitate treatments as specified above. The dossier suggests that the fresh mussel waste could be composted, or otherwise treated according to regulation EC No 1069/2009.

Environmental issues, use of resources, recycling
Recycling is the main reason why waste from mussels and similar production should be used in agricultural production. As they must fulfil the sanitary regulatory requirements, no risk for environment is envisaged.

Animal welfare issues
no issue

Human health issues
no issue

Food quality and authenticity
no issue

Traditional use and precedents in organic production
No traditional use as fertilizer is known, also because the availability of mussel waste is recent (in Sweden only since they are cultivated for counteracting eutrophication). As soil improver (only shells) it has limited traditional use in coastal areas. Other forms of calcium carbonate are traditionally used in organic farming.

Authorised use in organic farming outside the EU / international harmonization of organic farming standards
'Calcium carbonate of natural origin (e.g. chalk, marl, limestone, phosphate chalk)' is authorized as a fertiliser by the Codex Alimentarius guideline for the production, processing, labelling and marketing of organically produced food (edition 2013). 'Biodegradable processing by-products, plant or animal origin, e.g. by-products of food, feed, oilseed, brewery, distillery or textile processing' is authorized by the IFOAM Norms for Organic Production and Processing (edition 2014). In the USA, calcium from non-synthetic sources is allowed under the National Organic Program (NOP), and oyster shell flour is explicitly mentioned.

Other relevant issues
The use of waste materials from saline environments might contain salt in too high concentrations to be used in agricultural crops. In this case, analysis of salt content should be made available and assessment of use should be consistent to soil fertility preservation.

Reflections of the Group / Balancing of arguments in the light of organic production principles
The Group has no objections to the use of mussel waste and other mollusc wastes. The Group also has no objections to the use of egg shells, as long as factory farming is excluded (as for similar products already listed in Annex1). In case that mussel waste is digested, it is already authorized under the definition of "Biogas digestate containing animal by-products co-digested with material of plant or animal origin as listed in this Annex". However, the group thinks that other forms of shell waste should also be authorized. Such materials should be treated in a way which prevents sanitary risks and excessive odours according to sanitary regulation. The Group recommends adding the following materials to the list of authorized animal by-products: (1) mollusc waste; (2) egg shells (not from factory farming origin)

Conclusions
In the Group's opinion, the use of mussel waste and similar materials as soil conditioner and as fertilizer is in line with the principles and objectives of organic farming. Therefore, it should be authorized. The Group recommends adding two new entries to the list of authorized animal by-products as follows:

- waste of bivalve from aquaculture or from sustainable fishery
- egg shells (not from factory farming origin)

3.2.3 Structure liming

Introduction, scope of this chapter

The Group was asked to evaluate ‘structure liming’. The request is motivated by environmental reasons (reduction of eutrophication, resulting from better soil structure). The EU fertilizer legislation (Reg. 2003/2003) covers ‘liming materials’, but does not mention ‘structure liming’. ‘Structure liming’ is a practice developed in Sweden for the purpose of improving soil structure. This is usually done with a mixture of calcium oxide, calcium hydroxide and calcium carbonate. Structure liming is a special case of liming, and the Group finds it difficult to make a clear distinction between ‘liming’ and ‘structure liming’. Therefore, this chapter discusses both liming and structure liming.

Authorization in general production and in organic production
Calcium oxide, calcium hydroxide and calcium carbonate are all listed in Reg. 2003/2003, and thus authorized for general agriculture.
In organic production, calcium carbonate is authorized, while Calcium oxide and calcium hydroxide are not authorized.

Agronomic use, technological or physiological functionality for the intended use
Liming will increase the pH of the soil, and is most effective in soils with a low pH. It affects the following soil characteristics:

- Solubility of many nutrients
- Soil structure
- Soil microbiology

This is true for liming in general. In the case of ‘structure liming’, the focus is on the second effect, but all three effects will occur. Improvement of structure is the primary objective in clay soils. Consequently, the runoff of phosphorus might be reduced. The dossier states: «Structural liming (quicklime and slaked lime) “mimics” biological soil processes, by rapidly forming and enhancing soil aggregate structure through means of chemical reactions rather than biological long-term aggregate formation via the activity of soil organisms. »

Necessity for intended use, known alternatives
There are various alternatives (agronomic as well as liming materials), see Reflections below.

Origin of raw materials, methods of manufacture
Calcium carbonate occurs naturally as a mineral. By contrast, calcium oxide and calcium hydroxide do not naturally occur. Calcium oxide is obtained by ‘burning’ calcium carbonate at high temperatures (a process which consumes a lot of energy). Calcium hydroxide is obtained by treating calcium oxide with water.

Environmental issues, use of resources, recycling
Reduction of eutrophication is a positive effect.
The Group’s main concern is the potential impact on soil life. Calcium oxide and hydroxide will substantially and rapidly raise the soil pH. The dossier states: «Evidence indicates that structural liming may have negative short-term effects on microbial communities, and earthworm and coleopteran populations.». Palmu and Hedlund (2016) state that larvae of soil-dwelling beetles may be especially sensitive to (structural) liming, but a lack of evidence prevents more informed inference. Meanwhile results indicate that earthworm populations may be negatively affected in the short term but slightly enhanced in the long term, perhaps benefitting from improved soil/microhabitat conditions such as increased pH and more beneficial soil structure. More research is however needed also concerning earthworms. This concern is taken into consideration by the Group.

Animal welfare issues
No issues.

Human health issues
Structure lime is hazardous and should therefore be handled with care.

Food quality and authenticity
No issues.

Traditional use and precedents in organic production
Calcium carbonate is traditionally used in organic farming, and has a side-effect on soil structure. Calcium oxide and hydroxide have traditionally been rejected in organic production (only for cleaning and disinfection)

Authorised use in organic farming outside the EU / international harmonization of organic farming standards

Calcium carbonate of natural origin is authorized under all major international organic farming standards, while neither calcium oxide nor calcium hydroxide are authorized. This is true for the Codex Alimentarius guideline for the production, processing, labelling and marketing of organically produced food (edition 2013), the IFOAM Norms for Organic Production and Processing (edition 2014), and the National Organic Program (NOP) of the USA.

Other relevant issues
None.

Reflections of the Group / Balancing of arguments in the light of organic production principles
Eutrophication is a severe environmental problem and should be reduced as much as possible. Phosphorus is particularly critical. The principles of organic production imply the following strategy:

- As a priority, the farm should implement a crop rotation (including catch crops) which enhances phosphorus re-cycling.
- All the management should aim at an active soil life, especially mycorrhiza through adequate management of soil organic matter and phosphorus cycles.
- The input of phosphorus should be adjusted to the need of crops and their capacity to absorb it. This involves reductions in stocking rates, as well as adaptations of fertilization.
- As an additional measure, soil structure may be improved, to reduce run-off. As a first step, soil structure should be improved with appropriate management practices (e.g. manure with high C/N ratio, organic matter inputs, crop mixtures with diversified rooting).
- As next step, soil structure can be improved with currently authorized inputs, such as limestone and gypsum.

In the Group's opinion, this list is sufficient to manage the problems of phosphorus runoff. Organic farming practices are already a method for reducing phosphorus runoff (Sch*ulz et* al., 2009; Scha*der et* al., 2012). The dossier mentions that structure liming is subsidized in Sweden, as a measure to protect the Baltic sea.

Conclusions
In conclusion, the Group sees no need for authorizing calcium oxide and hydroxide. These two substances, used as soil conditioners, are not in line with the objectives and principles of organic production and should not be included in Annex I of Reg. 889/2008.

3.2.3 Preliminary evaluation of oil shale ash

Introduction, scope of this chapter
During the sub-group meeting, the Group was asked to evaluate oil shale ash. The Group had very limited time to evaluate the dossier, and could therefore produce only a preliminary evaluation. Oil shale ash is a by-product from burning oil shale, e.g. for production of electricity. Oil shale ash is a form of granulated calcium carbonate.
Liming in general is described in the evaluation of structure liming. This sub-chapter does not repeat the general aspects, but focuses on aspects specific to oil shale ash.

Authorization in general production and in organic production
Oil shale ash is not covered by the EU fertilizer legislation 2003/2003. In some countries (e.g. Estonia), it is covered by national legislation and may therefore be used in general production.
Oil shale ash is not authorized for organic farming in the EU.

Agronomic use, technological or physiological functionality for the intended use
Oil shale ash has been traditionally used as a liming material in the Baltic states.

Necessity for intended use, known alternatives
There are other liming materials (see other sub-chapters in this report).

Origin of raw materials, methods of manufacture
Oil shale is burnt (e.g. in electrical power stations) at temperatures of 900 – 1500 ºC. The ash is filtered out of the exhaust gases by means of cyclones and filters. This material is present as fine particles and may be used as a fertilizer without further treatment. No chemicals are added.

Environmental issues, use of resources, recycling

The dossier does not address contaminants. The Group assumes that when oil shale is burnt, similar substances will be formed as when mineral oil is burnt. The Group is concerned that oil shale ash might be more contaminated than other liming materials (limestone, gypsum).

Animal welfare issues
No issues.

Human health issues
No issues.

Food quality and authenticity
No issues.

Traditional use and precedents in organic production
Calcium carbonate of other origin is traditionally used in organic farming. However, oil shale ash has no traditional use in organic production.

Authorised use in organic farming outside the EU / international harmonization of organic farming standards
Oil shale ash is not explicitly mentioned in the major international organic farming standards (Codex Alimentarius guideline for the production, processing, labelling and marketing of organically produced food (edition 2013); IFOAM Norms for Organic Production and Processing (edition 2014); National Organic Program (NOP) of the USA). However, it can be considered as calcium carbonate of natural origin, in which case it would be allowed.

Other relevant issues
None.

Reflections of the Group / Balancing of arguments in the light of organic production principles
Considering the lack of knowledge on possible contaminants, the Group does not recommend its use now. In case that the applicant can demonstrate that oil shale ash is safe, the Group may assess application of shale ash again.

Conclusions
Due to missing information, the Group cannot take a decision. The one analysis provided by Estonia is not sufficient. It does not contain PAHs, dioxins, PCBs etc.

3.3 Leonardite / humic and fulvic acids

The Group makes a distinction between unprocessed leonardite on one hand, and humic and fulvic acids on the other.

3.3.1 Clarification concerning unprocessed and processed leonardite, and solid and liquid products

Leonardite was previously evaluated by EGTOP (see EGTOP report on fertilisers and soil conditioners from 2011). Already at that time, the Group emphasized that its evaluation concerned only unprocessed leonardite.

Clarification concerning unprocessed leonardite

Unprocessed leonardite is solid, and has low solubility in water. The Group confirms its evaluation from 2011, and sees no need to question the listing of leonardite in Annex I of Reg. 889/2008.

Clarification concerning processed leonardite

For use in commercial fertilisers, leonardite is usually processed. If it is crushed or milled, the resulting powder is still leonardite. However, leonardite is also often treated with alkaline substances. Such a treatment will generate humic and fulvic acids, which are water soluble. Fertiliser manufacturers sometimes advertise such products with expressions like ‘liquid leonardite’, if they wish to suggest that the product is acceptable for organic farming. The Group emphasizes that in chemical terminology, there is no such thing as ‘liquid leonardite'. The Group prefers to refer to such materials as 'humic and fulvic acids'. Humic and fulvic acids are evaluated in the next chapter.

Clarification about the 'principle of low solubility'

The Group was asked to clarify whether the use of liquid products made from leonardite would conflict with Article 4(b)(iii) of Regulation (EC) No 834/2007. This article limits the use of external inputs to 'low solubility mineral fertilisers'. Leonardite is not a mineral fertiliser, therefore this article is not applicable.

3.3.2 Humic and fulvic acids

Introduction, scope of this chapter
The Group was asked to evaluate humic and fulvic acids (abbreviated as HFA hereafter) obtained by processing leonardite with potassium hydrogen carbonate. There is uncertainty in the organic sector concerning the acceptability of HFA obtained with various methods. Therefore, the Group discusses HFA obtained with potassium hydrogen carbonate together with other methods.

Authorization in general production
The EU fertilizer legislation does not cover HFA at the moment. However, they may be authorised by national fertiliser legislation.

Authorization in organic production
HFA are not mentioned in Annex I of Reg. 889/2008. In the second report on fertilisers and soil conditioners (chapter 4.8.4), EGTOP stated the following: « … As regards acids, alkalis or organic solvents, the Group considers that these should not be generally authorized. The use of such substances should be authorised only after case by case evaluation. There are different interpretations whether humic and fulvic acids are authorized for organic production.

- Some stakeholders consider that HFA are not mentioned in Annex I and therefore prohibited.
- Some stakeholders consider that HFA are covered by the listing of leonardite and therefore authorised.

Agronomic use, technological or physiological functionality for the intended use
HFA are natural constituents of the soil organic matter, resulting from the decomposition of plant, animal and microbial residues. They are collections of heterogeneous compounds which show complex dynamics of association/dissociation into supra-molecular colloids, influenced by plant roots via the release of protons and exudates. Humic substances have been recognized for long as essential contributors to soil fertility, acting on physical, physico-chemical, chemical and biological properties of the soil. Most bio-stimulant effects of HFA refer to the improvement of root nutrition, via different mechanisms. One of them is the increased uptake of macro- and micronutrients, due to increased cation exchange capacity of the soil and to increased availability of phosphorus. HFA also contribute to root nutrition, cell enlargement and organ growth. Stress protection has also been proposed (du Jardin, 2015). HFA can be applied to the soil as well as to the foliage of crops. They are often applied in combination with fertilisers. The effects of HFA are complex and context-dependant, yet globally positive. They include increases of root and shoot biomass (du Jardin, 2015).

Necessity for intended use, known alternatives
HFA are important for soil fertility. However, HFA are naturally present in soils, organic manure from animal excrements and compost, and the Group doubts whether it is necessary to add HFA to the soil in a pure form. On foliage, HFA are not naturally present.

Origin of raw materials, methods of manufacture
HFA are most frequently obtained by treating leonardite with aqueous solutions of alkaline substances. The most frequently used alkaline is potassium hydroxide (KOH). However, other substances may also be used, e.g. potassium hydrogen carbonate ($KHCO_3$).

There is also an alternative way for obtaining humic and fulvic acids: in some northern European countries, where the soil is rich in peat, groundwater naturally contains traces of humic and fulvic acids, which give a brownish colour to the water. In the process of drinking water purification, they are therefore removed with ion exchange columns that absorb humic and fulvic acids. After some time, the columns are packed with humic and fulvic acids and have to be regenerated. This process makes humic and fulvic acids available, and usable as fertilisers. In conclusion, naturally present humic and fulvic acids are concentrated and collected in this process, which is different from the manufacture of humic and fulvic acids from leonardite. The Group points out that there is a rather limited supply of such materials, which could not meet the EU-wide need for humic and fulvic acids.

Environmental issues, use of resources, recycling
The Group has no concerns.

Animal welfare issues
No issues.

Human health issues
No issues.

Food quality and authenticity
No issues.

Traditional use and precedents in organic production
As HFA are natural constituents of the soil, they are always present when crops are grown in the soil. They are also natural constituents of compost, vermicompost and leonardite, and every compost tea contains HFA.

Authorised use in organic farming outside the EU / international harmonization of organic farming standards
HFA are mentioned neither in the Codex Alimentarius guideline for the production, processing, labelling and marketing of organically produced food (edition 2013) nor in the IFOAM Norms for Organic Production and Processing (edition 2014). HFA, including those extracted with alkalis, are allowed under the National Organic Program (NOP). However, there is a restriction that they may not be 'fortified', i.e. synthetic alkalis may only be added in the minimum quantity required to dissolve the HFA, and not as a nutrient (e.g. potassium).

Other relevant issues
Due to the use of potassium hydroxide (or potassium hydrogen carbonate), HFA products contain some potassium of synthetic origin. The Group considered a commercial product as an example: it contains 15 % HFA and 3 % potassium, and is used at a rate of 45 l/ha. This amounts to 7 kg/ha HFA and 1.5 kg/ha K. The Group considers potassium hydroxide and potassium hydrogen carbonate as processing aids in the production of HFA and, as such, acceptable.
Reflections of the Group / Balancing of arguments in the light of organic production principles
HFA are present in natural constituents of the soil and in many inputs already allowed in organic farming. They have a positive influence on soil fertility. The maintenance and enhancement of soil fertility is a principle of organic farming. The Group has doubts about the necessity for applying HFA in organic farming. However, it considers them to be harmless. Regarding the alkalis used for manufacture, the Group considers that inorganic salts/solutions excluding ammonium salts are acceptable. In the Group's opinion, the following sources of HFA are acceptable:

- HFA obtained from leonardite using inorganic salts/solutions excluding ammonium salts, and
- HFA obtained from drinking water purification.

Conclusions
In the Group's opinion, the use of humic and fulvic acids are in line with the objectives and principles of organic production. Humic and fulvic acids should therefore be included in Annex I with the following restriction: 'only if obtained with inorganic salts/solutions excluding ammonium salts, or from drinking water purification'.

3.4 Sanitary aspects of fertiliser use

In the first EGTOP report on fertilisers and soil conditioners the Group has provided evaluations of hydrolysed proteins (section 3.1) and of digestate containing animal by-products (section 3.5). For both materials, the Group recommended that applications to edible parts of crops should not be allowed for sanitary and ethical reasons (vegetarians, vegans). In this mandate, the Group is asked to comment on this statement.

Digestate containing animal by-products

Digestates are complex mixtures of materials, many of which are not suitable for human consumption. This is true for all digestates, regardless whether they contain animal by-products or not. In fact, it is true for all fertilisers which do not have a precisely defined chemical composition, such as composts, digestates and manure.

The sanitary risks depend greatly on the mode of application. Solid products such as composts are always applied to the soil, and usually before sowing/planting. In this way, the edible crop parts are not contaminated by the solid manure products. In digestates, there is a solid and a liquid phase (sometimes, the two are mixed, resulting in a solid, moist product). The solid digestate is applied like compost, while the liquid digestate is applied like slurry. Liquid digestate may be applied at various stages of crop development. If it is applied at late stages, there is a potential for contamination of edible parts, depending on the growth form and developmental stage of the crop. The restriction 'not to be applied to edible parts of the crop' thus means: 'not to be applied at times when the crop has developed above-ground, edible parts'. The Group emphasizes that this applies also to feed materials. In the Group's opinion, good agricultural practise prevents direct contact of organic fertilizers with edible crop parts or feed materials.

The Group emphasizes that this restriction was not based on the use of animal by-products. In the Group's opinion, risks related to animal by-products are adequately managed by the application of Commission Regulation (EU) No 142/2011. For biogas production based in organic input, this implies a thermal treatment of all inserted materials (hygienisation), plant and animal, before the digestion. When the Group was asked in that mandate to evaluate biogas digestate containing animal by-products, it suggested such a restriction. This was mainly based on the liquid nature of some digestates. It is clear to the Group that similar restrictions would be equally justified for other liquid fertilisers such as slurry. However, good agricultural practise and horizontal regulation already exclude the application of such fertilisers to edible crop parts. It might thus not be necessary to make such a requirement also in the organic legislation.

Hydrolysed proteins
The same reasoning as for digestate containing animal by-products applies.

3.5 Highly soluble nitrogen and phosphorus fertilisers for aquaculture of *Arthrospira* species (sold as 'Spirulina')

The Group was asked to evaluate 'sources of nitrogen and phosphorus of organic origin and highly soluble only for organic cultivation of algae'. Such fertilisers have recently entered the market (not only as nutrients for microalgae, but also as fertilizers for crops) and there is uncertainty in the organic sector concerning the acceptability of such fertilisers. The Group sees a need to discuss such fertilisers not only in the context of *Arthrospira*, but in a more general context. Therefore, the Group discusses the fertilization of spirulines separately from these novel fertilisers.

3.5.1 Novel fertilisers obtained by stripping of ammonia

Introduction, scope of this chapter
In the last years, a number of methods of nitrogen capture have been developed, in order to eliminate substances such as ammonia from gases and/or liquids. The primary motivation is to clean the air or slurry, for purposes such as workplace safety, environmental protection and preservation of installations (ammonia is corrosive). The by-products of nitrogen capture are nitrogen-rich substances, which may be used as fertilisers.
Stripping can be done on different materials and with different methods. In some cases, nitrogen is capture from materials authorised in organic farming such as manure, and with biological methods.

Authorization in general production and in organic production
The products obtained by this methodology are authorized for use in general production, but not in organic production.

Agronomic use, technological or physiological functionality for the intended use
The products are intended to be used as highly soluble nitrogen fertilizer for various purposes including the nutrition of micro-algae.

Necessity for intended use, known alternatives

Nitrogen is usually a limiting nutrient in organic farming and cultivation of micro-algae. It acts fast, but has the problem of easy leaching. It does not feed the soil life, which is a principle of organic fertilization. For cultivation of terrestrial crops, there are numerous alternatives (methods and products). For micro-algae, see separate sub-chapter below.

Origin of raw materials, methods of manufacture
A wide variety of materials emits ammonia. Examples are manure (especially chicken and pig litter), composts, digestates, sewage sludge, municipal and industrial wastes. There are various methods to capture nitrogen. A frequently used method is the so-called 'acid air scrubber', where the exhaust gas comes into contact with acid water drops and the ammonia is captured in the water. Most frequently, the water is acidified with sulfuric acid. The resulting nitrogen compound is ammonium sulphate, which contains 21 % nitrogen and 24 % sulphur (Hadlocon and Ziao, 2015). Other acids are sometimes also used. Another method is the so-called 'biotrickling filter'. In this device, no acids are used, but the ammonia is converted to nitrite and subsequently to nitrate by the action of nitrifying bacteria such as *Nitrosomonas* and *Nitrobacter* species (Melse and Ogink, 2005).

Environmental issues, use of resources, recycling
Cleaning of air e.g. from barns or storage as well as cleaning of sewer sludge for minerals is very positive. The idea of catching otherwise 'lost' minerals and recycling them is in line with the organic principles. The catching of nitrogen can be an on-farm process. The products obtained are highly soluble and have a potential risk of nitrogen leaching, when applied into farming. If the biological process is not properly managed, there is a risk of formation of nitrous oxide (N_2O), which is a greenhouse gas with a high climate impact.

Animal welfare issues
No issues.

Human health issues
Cleaning of barn air for ammonia enhances air quality.

Food quality and authenticity
The use of mineral nitrogen will stimulate rapid growth. Consequently, the nutritional quality of crops can be decreased by high values of nitrate in the harvested crop.

Traditional use and precedents in organic production
There is a traditional policy for not allowing highly soluble mineral fertilisers in organic farming as it is clashing with the principle of feeding the soil and not the plants.

Authorised use in organic farming outside the EU / international harmonization of organic farming standards
None of the major international organic farming standards authorizes stripped nitrogen at the moment. This is true for the Codex Alimentarius guideline for the production, processing, labelling and marketing of organically produced food (edition 2013), the IFOAM Norms for Organic Production and Processing (edition 2014), and the National Organic Program (NOP) of the USA.

Other relevant issues
None.

Reflections on organic principles
Two principles conflict in the case of captured nitrogen fertilisers:

- On one hand, the recycling of wastes and by-products of plant and animal origin is explicitly welcome (see Art 5(c) of Reg. 834/2007).
- On the other hand, there is a requirement that mineral fertilisers must be of low solubility (see Art. 4(b)(iii) of Reg. 834/2007). One of the key distinctions between organic and conventional farming is that organic farming uses nitrogen fertilisers of low solubility, while conventional farming uses high solubility nitrogen fertilizers.

Concern over high solubility mineral fertilizers
There are good reasons why the use of high solubility mineral nitrogen fertilizers is in conflict with the principles of organic production (see Art. 4(b)(iii) of Reg. 834/2007). If such fertilizers were allowed, the Group is concerned that the current approach of organic crop nutrition which is primarily based on biological aspects of soil fertility would be replaced by a conventional, intensive approach focussing on nutrient supply. This is illustrated below with a number of scenarios.

Scenarios of hypothetical use illustrating the problematic of high solubility nitrogen fertilizers
The Group considered several hypothetical critical scenarios how stripped nitrogen might be used on organic farms.

- Scenario 1: A large, mixed farm could strip the nitrogen from the animal husbandry (organic or conventional). They could use the stripped nitrogen on a few selected crops, e.g. lettuce. This crop could be grown largely with such nitrogen, which is against the principles and very similar to conventional production.
- Scenario 2: A farm mixes stripped nitrogen with straw and immediately applies it to corn. Although such a fertilization method is closer to organic practices, several questions remain: How to define the proper ration of nitrogen to straw or the minimum C/N ratio? How can inspection verify that this minimum ratio is respected?
- Scenario 3: A composting plant strips nitrogen and returns it to the material. If the stripped nitrogen would remain in the compost for long enough, it would be transformed into low solubility organic forms. However, it is difficult or even impossible to define a minimum time for the nitrogen to stay in the compost before application and it would be very difficult to verify such a requirement during inspection.
- Scenario 4: A farm strips nitrogen from the effluent water of a fish pond and the farm has no crops. Can the stripped nitrogen be applied to seaweed? If yes: under what conditions?
- Scenario 5: If no seaweed is grown: can the stripped nitrogen be sold to another organic farm? In that case, the above concerns would also apply.

Considerations on materials of origin
Contaminants present in the raw materials will not be transferred to the stripped nitrogen. Which materials are used is not the primary concern of the Group. Materials can be ranked (with decreasing acceptability) as (1) only materials from organic operations; (2) all materials mentioned in Annex I; or (3) all materials.
In case of option 3, the Group felt that organic farming would be ‘cleaning up the mess of conventional farming’ and this is not the purpose of organic farming.

Considerations on production methods
Production methods are also not the primary concern of the Group. Biological methods should be preferred to chemical methods, even if the use of certain chemicals can be acceptable, if no alternatives are available (for an example, see humic acids). If chemical air scrubbers with sulfuric acids are used, substantial amounts of sulfate are produced, which is not an authorized fertilizer.

Concern on acceptability for the organic system
The Group considered that organic farming should not be the dumping place for conventional farming and municipal wastes, and that consumers might be concerned about the use of such materials.

The Group supports all methods for reducing pollution, including nitrogen capture, and is in favour of recycling such nitrogen back into the agricultural cycle. The Group would like to see the appropriate use of such nitrogen compounds. However, it sees potential risks of inappropriate use (not in line with organic principles). Now, the Group cannot see how the use of such materials could be regulated appropriately and in a way that can be inspected effectively. Therefore, the Group does not recommend the use of stripped nitrogen. The Group would welcome research activities which lead to an acceptable mode of application of stripped nitrogen, in line with organic farming principles.

Conclusions
In the Group’s opinion, the proper use of stripped nitrogen in line with the objectives and principles of organic farming cannot be assured. Therefore, the Group does not recommend including stripped nitrogen in Annex I.

3.5.2 Nutrition of *Arthrospira* (‘spirulines’) and other micro-algae

‘Spirulina’ is the trade name of one of several micro algae types that have been promoted as feed and food additives. Micro-algae are seen as a promising protein and nutrient source for the future, for food and feed use. Some health effects have been reported on humans (suppressing anaemia and immune senescence in older persons, and anti-bacterial and skin care effects when using fermented spirulina), however scientific proof is hard to find.

The organic production of micro algae for feed and food is already covered by the EU regulation, including their nutrition. Organic production of micro-algae is possible under current rules. According to the dossier, however, the water use could be greatly reduced if captured nitrogen was used instead of plant materials.

Their cultivation is currently regulated under seaweed (art 6 bis). In the Group's opinion, micro-algae are different from seaweed and should therefore be regulated separately.

In micro-algae production, it is not accurate to use the term "fertilization". "nutrition" is a more correct wording. Spirulines should be nourished with soluble nutrients. Therefore, the principle that only low solubility mineral fertilizers may be used in organic production, cannot be applied to micro-algae.

Article 6d or Reg. 889/2008 currently allows only nutrients of plant or mineral origin. Two questions to Aquaculture experts:

- Should nutrients of animal origin be allowed for production of micro-algae and/or seaweed?
- Should stripped nitrogen be allowed for production of micro-algae and/or seaweed?

As a side-remark, the Group notes that an authorization of 'nutrients of animal origin' would not automatically cover stripped nitrogen. Stripped nitrogen would need to be listed explicitly, if there is an intention to allow it.

Conclusion
There is the need of a specific Aquaculture sub-group meeting in order to properly assess the application.

3.6 Other issues

1. There are widespread concerns (also among consumers) about the potential presence of contaminants, such as antibiotic and other veterinary medical products, hormones, antibiotic-resistant bacteria, heavy metals in animal and plant-based nutrients from conventional origin. The Group is particularly concerned about the presence of antibiotics, because even low amounts promote the build-up of antibiotic resistance in bacteria. There is a risk that antibiotic resistance may be transferred also to human pathogens. The Group is not aware of in-depth research results and recommends that these problems are analysed by research projects. Two large research projects in the H2020 -SFS-2016-2017 call contentious inputs (Sustainable Food Security – Resilient and resource-efficient value chains) Organic plus and ReLacs are going to investigate alternatives to antibiotics and other preparations inducing antibiotic resistant bacteria. The Group recommends that when research results on these aspects are available, they should be considered in future evaluations of amendments.

2. In annex I the terminology" Factory farming" is introduced and manure from this origin is forbidden" by different MS and by different certification bodies. However, it is unclear what factory farming is and how it should be defined. This is causing an unfair situation in which certain fertilizers can be used in some Mss and not in others. EGTOP proposes to establish an expert subgroup on this issue, which from scientific point of view should define "Factory farming". The group recommends to collect from Mss the official definitions of "factory farming" and start a harmonization process as the different interpretation (not only at MS level but also at certification body level) is producing an unfair situation in which certain fertilizers can be used in some Mss and not in others.

MINORITY OPINIONS

none

3. LIST OF ABBREVIATIONS / GLOSSARY

None.

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