

To: the European Commission:

*Sabine Jülicher, Director, Food and feed safety, innovation, DG SANTE DDG2.E
and Matjaz Klemencic, Policy Officer Animal Health, European Commission DG SANTE*

*Copy: Hans Ingels, Head of Unit, DG GROW F2 Bioeconomy & chemicals
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16th April 2021

Object:

Animal By Product End-Points for EU Fertilising Products Regulation “STRUBIAS” materials

Dear Ms. Jülicher, dear Mr. Klemencik,

As you are aware the “STRUBIAS” amendments of the EU Fertilising Products Regulation (FPR) are now technically finalised, setting out criteria for (1) precipitated phosphate salts and derivatives, (2) thermal oxidation materials and derivatives and (3) pyrolysis & gasification materials as Component Materials in CE-Mark fertiliser products.

In each case, certain Cat2 and Cat3 Animal By products or derived products thereof are authorised as inputs to the STRUBIAS material production process, under specified conditions, subject to an ABP End-Point having been determined.

It is our understanding that to date no mandate has been submitted to EFSA to define the End-Points necessary to use ABPs as inputs for STRUBIAS materials (except maybe for thermal oxidation materials, see below). Consequently, the FPR with STRUBIAS seems likely to come into force in mid-2022 but with ABPs excluded from STRUBIAS materials.

We have questioned our network of companies, stakeholders and researchers involved in nutrient recycling to STRUBIAS-type materials, including several EU-funded initiatives (Horizon2020, Interreg) as well as process and market companies. Our conclusions are as follows:

Precipitated phosphate salts and derivatives

Although there are a number of R&D projects and probably a few full scale pilot plants operating outside Europe, to date we have identified only one plant producing STRUBIAS-conform (low organics, etc) precipitated phosphate salts from ABP inputs. This plant uses both manure digestate and raw manure (NuTriSep Geltz at Kupferzell, Germany). We have established a short table listing processes and plants identified, and can make this available to you on request, should you be interested.

We also note that when the precipitation of this type of STRUBIAS material is from ABP digestate (e.g. manure digestate), which is often the case, then the digester itself is often operated to achieve an ABP End-Point, in which case this the ABP End-Point is “resolved” for the resulting STRUBIAS material.

On the other hand, it seems unlikely that the phosphate precipitation process itself will ensure sanitisation, in that it often takes place at room temperature and at non-aggressive pH. Certainly, the precipitation process will reduce pathogens, as can washing and storing the precipitated phosphate, but new studies would

probably be necessary to define conditions sufficient to ensure an ABP End-Point, probably dependent on the input material, precipitation conditions, final material organic content ...

For these reasons, ESPP does not plan to pursue further the ABP End-Point question for this STRUBIAS category, unless and until a significant EU market seems to be developing.

Thermal oxidation materials and derivatives

ABP ash is of strong interest as an input to fertiliser production, because of its relatively high phosphorus and potassium content and low heavy metal levels, compared to e.g. sewage sludge incineration ash or wood ash.

ABP ash is already used as a fertiliser under national regulation in many Member States (e.g. poultry manure/litter combustion ash), with recognised agronomic value.

For information, the Swiss P-recovery obligation (VVEA Ordinance on Avoidance and Disposal of Waste) requires recycling of phosphorus both from sewage sludge incineration ash and from ABP ash, because of the significant nutrient recycling (P, K) in this ABP ash and because of its low contaminant levels.

A number of full-scale processes for P-recovery from various ashes are under construction, have been tested full scale, etc, including those under construction to fulfil the German and Swiss national obligations to recover phosphorus from around sewage, as well as large projects in e.g. Austria, Sweden, and including large mineral fertiliser industry phosphate production sites adapting their process to take ashes as an input material. All these processes can take ABP ash as an input material, subject to appropriate operational safety management systems (avoidance of input – output cross-contamination, etc), and many would welcome ABP ash because of its high P and K content and low contaminant levels.

Use of ABP ash under STRUBIAS would thus be a significant contribution to EU nutrient circular economy policy, with real market significance today.

The STRUBIAS criteria require combustion of ABPs and derived products at 850°C etc, that is the conditions specified for safe destruction of ABPs in the Animal By-Products Regulations. The JRC STRUBIAS report (p. 130) states that “*the thermal oxidation process efficiently causes the thermal death of all biological microorganisms ...*”. A similar conclusion is taken into account in the Swiss legal obligation to recycle P from ABP ash as well as from sewage sludge incineration ash.

ESPP notes that “(2) *ash derived from incineration, co-incineration and combustion*” is included in the Terms of Reference of the mandate transmitted by the European Commission to EFSA (ARES(2020)2316806 – 30/04/2020, as published on the EFSA website). It is not clear whether this covers STRUBIAS “Thermal oxidation materials and derivatives” materials.

We note that the ABP Regulation 1069/2009 specifies in Arts. 13 and 14, as an option for Cat2 and Cat3 ABPs, that they be: “disposed of as waste by incineration”.

ESPP suggests therefore that

- It should be a **priority to enable the use of ABPs in STRUBIAS thermal oxidation materials and derivatives** when the FPR enters into implementation in June 2022
- There is **no need for data to demonstrate safety of STRUBIAS ABP ashes**, nor for data on the combustion processes, in that the incineration conditions specified in STRUBIAS (for ABPs) are recognised under the ABP Regulations as ensuring safety.

We request that the European Commission

- **indicate whether the reference to ash derived materials in the EFSA mandate of 30/04/2020 covers STRUBIAS “Thermal oxidation materials and derivatives”.**
- **assess whether it is possible to enable use of ABPs in STRUBIAS thermal oxidation materials and derivatives without an EFSA opinion by clarification of regulation interpretation,**

The latter could maybe be achieved by, for example, specifying regulatory conditions in the FPR Frequently Asked Questions and/or by specifying that use is acceptable if the ABP management process (avoidance of cross-contamination, incineration conditions, traceability ...) respects the conditions required under 1069/2009 art. 13(a) and art. 14(a). We hope that you can consider, with the Commission’s legal service, possible regulatory solutions to this.

Pyrolysis & gasification materials

There is a potentially **significant potential for production of biochars, pyrolysis and gasification of manures and of other ABPs**, to produce a stable, transportable material with significant agronomic value because of its nutrient content (P, K) and because of soil improvement properties of the organic carbon. Processes are already operating full scale in Europe and elsewhere.

The JRC STRUBIAS report (p158), after assessing several sources of data on pathogen elimination, information on the processes, and after comparison to ABP End-Point requirements, considers that the conditions specified in the STRUBIAS criteria will ensure elimination of pathogens and that *“compliance with the ABP Regulation will be met for all pyrolysis & gasification materials derived from ABPs”*.

Contrary to ashes, we note that pyrolysis and gasification materials are not included in the Terms of Reference of the 30/4/2020 mandate to EFSA.

We request that the European Commission:

- **Mandate EFSA to define the ABP End-Point necessary to enable use of ABPs in STRUBIAS “Pyrolysis and gasification materials”** (and specify conditions)
- **Indicate whether you consider that the JRC STRUBIAS report provides sufficient data to support this EFSA request? Or if not, then please specify what further data or information is required and how it should be submitted?**
- **Indicate a possible timeline for the different stages of this procedure** (mandate to EFSA, EFSA opinion, modification of the ABP Regulation annexes to include the End Point defined)

We hope that you will find this input useful and constructive and look forward to your replies to our requests and questions, which we believe will be of interest to many operators in Europe (water companies, municipalities, recycling technology providers, fertiliser companies ...).

Yours faithfully



Ludwig Hermann, President.

Recovery of potential STRUBIAS struvite or other phosphate salts from Cat2 and Cat3 animal by-products

ESPP 23/4/2021

<i>Input materials</i>	<i>Process</i>	<i>Status of implementation</i>
Manure, other ABPs	P-salt precipitation from digestate, or from digestate after solid/liquid separation	<p>NuTriSep (Geltz), Kupferzell, Germany. 10 m³/hour installation operating since 2020 (year/date). Larger scale demonstration installation currently under permitting. Input is biogas plant digestate (digested pig and cattle manure and plant biomass) and also some raw poultry or cattle manure. The digester itself achieves Animal By-Product End-Point (sanitisation) as per German Bioabfallverordnung. Product is mixed calcium phosphate / struvite and also ammonia sulphate solution, conform to STRUBIAS precipitated phosphate salt criteria.</p> <p>ANPHOS (Colsen), Biogastur, Spain. No longer operating. In this case, the thermophilic digester already ensures the ABP End-Point.</p> <p>Full scale Ca-P and/or struvite recovery at Groot Zevent Vergisting, Beltrum, NL, Nijhuis RePeat process (EU Horizon2020 SYTEMIC project demonstration plant and report), processing 135 000 t/y manure (pig+cattle), dairy industry waste and food waste (off date). After anaerobic digestion, 90% of incoming P is transferred to solid fraction of which 10-20% goes to solid, low-P soil improver and the remainder to precipitated calcium phosphate, recovered from the liquid fraction. The digester itself achieves??? does not achieve??? Animal By-Product End-Point (sanitisation). At present, this calcium phosphate has too high organic carbon to meet STRUBIAS criteria. It is planned to test struvite production, which may achieve lower organic carbon.</p>
Raw bovine manure	Struvite precipitation from liquid dairy manure	<p>No commercial operations.</p> <p>Pilot R&D/demo installations operating:</p> <ul style="list-style-type: none"> - Washington State University link - Fertimanure, Arjan Prinsen farm link
Solid/liquid separated swine manure	Mixed P-salt (struvite, calcium phosphates) from pig manure	<p>No commercial operations</p> <p>Pilot R&D/demo installations</p> <ul style="list-style-type: none"> - BioEcoSim (Fraunhofer / Suez): 10 000 t/y pilot Zorbau, Germany, operating since July 2019 (pig manure) link and contact - P-RoC: a demonstration plant in Boxberg, Germany operated 2012-2014. 9 000 m³ liquid pig manure/y, input 36 t P-fertiliser/y.
From dairy product processing wastewaters	To our understanding, this is not 'Animal By-Product' so is not relevant Example: Hünfeld, Germany – struvite is produced from whey and cheese processing wastewater.	
From food waste	To our understanding, this is not "ABP" unless the food waste is mixed with catering waste, so is not relevant.	
From liquor after hydrothermal carbonisation of ABS	<p>No commercial operations to date.</p> <p>AbonoCARE pilot, Crimmitschau, Germany (10 kg/h input): phosphate precipitation from hydrothermal carbonisation process water link and contact</p> <p>AVAcleanphos pilot, Murchin, Germany (30 kg/h input): phosphate precipitation from liquor obtained by acid leaching of hydrochar link and contact</p> <p>In these cases, the hydrothermal carbonisation process would probably ensure ABP sanitisation.</p>	