## Legal status of nutrient recycling from aquaculture – fisheries wastes and by-products – ESPP draft v22/1/24 - p. 1 /4

Material	Comment	Waste status	EU Animal By-Products Regulation 1069/2009	EU Fertilising Products Regulation 2019/2009	EU Organic Farming 2021/1165 (Annex II)	Animal Feed Regulations
Fish excrement (fish production aquaculture sludge)	33 000 t/y in sludge from fish farms in Norway ( <u>PwC</u> <u>2023</u> ). Sanitised, dried fish sludge is used in commercial organic fertilisers in Norway by the company <u>Grønn Gjødsel</u> . Potential processes for struvite precipitation from aquaculture wastewaters have been tested, e.g. <u>DOI</u> .	Waste	<ul> <li>Cat. 2 ABP ??</li> <li>NOT ABP manure.</li> <li>Excluded from the definition of manure in 1069/2009 art. 3.20.</li> <li>appears to be an ABP by art. 3.1 of 1069/2009 because NOT excluded from definition of manure in 1774/2002 health rules defining ABPs not intended for human consumption.</li> <li>but also appears to BE EXCLUDED from ABP Regulation by 1069/2009 art. 2.2(k) ("This Regulation shall not apply to excrement and urine other than manure")</li> <li>Fish excrement is not included in the ABPs listed as Cat.1 or Cat.3 in arts. 8 and 10 of 1069/2009. Therefore by art. 9(h) (i.e. ABPs other than Cat. 1 or Cat. 2) of 1069/2009, then if it is an ABP, then it must be Cat. 2.</li> </ul>	Can as today be used as inputs to CMC3 (compost), CMC5 (digestate), CMC13 (ashes), subject to the composting / digestion / combustion process respecting the ABP end point processing conditions fixed in the DG SANTE Delegated Act 2023/1065 arts. 3(a), 3(b) or 3(c). Today cannot be used as input to CMC12 (precipitated phosphates – see below) nor CMC14 because the only relevant defined ABP end point is for "Processed Manure" (2023/1065 art. 3(d) but fish excrement is excluded from "manure" under the ABP regulation 1069/2009. Can be used today as input for recovery of CMC15 materials from offgases (CMC15 art. 2(b)), because gases are not ABPs.	In all cases "factory farming" prohibited. Does this exclude all aquaculture slurry ? Use "as such" as fertiliser is NOT authorised (only "farmyard manure" and "liquid animal excrements" – fish excrement / aquaculture slurry is neither of these). Use as input to composts is authorised ("animal excrements"). Use as input to digestate is NOT authorised (not included in "animal by- products as listed")	767/2009 art. 6(1) and Annex III \$5: excludes "Faeces, urine irrespective of any form of treatment or admixture". Does this exclude for example: incineratior of fish slurry -> chemical recovery of calcium phosphate fo animal feed from the ash
Non-fish aquaculture slurry		Waste	<b>Cat. 2 ABP and "manure".</b> Not excluded from definition of manure in 1069/2065 -> Cat. 2 ABP.	In future: could be included in "Processed Manure" under the TBD conditions of future CMC10		
Shellfish: shells without soft tissue	Potential as biostimulants (chitin) and input for organic fertilisers.	Waste	NOT an ABP: specifically excluded from 1069/2009 by art. 2.2(f).		Mollusc wastes, shellfish chitin: Organic or sustainable fisheries only	?
Precipitated phosphates recovered from fish processing factory wastewater	Included in BAT 10 in IED BREF Food, Drink and Milk Industries. In seafood processing, struvite tends to form naturally (seawater Mg), causing crystals in the product (see e.g. <u>here</u> ).	Waste	Cat. 3 ABP by art. 10(e) (arising from the production of products intended for human consumption")	Excluded from CMC12: no ABP end point defined.	Excluded from Organic Farming, because 2021/1165 requires FPR conformity.	?

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Material	Comment	Waste status	EU Animal By-Products Regulation 1069/2009	EU Fertilising Products Regulation 2019/2009	EU Organic Farming 2021/1165 (Annex II)	Animal Feed Regulations
Precipitated phosphates recovered from aquaculture sludge / wastewater		Waste				
Fish bones and skin, as such or chemically processed. See below "fish meal".	Fish bones (like all bones) have significant fertiliser potential (N, P)	Waste	Cat. 3 ABP by art. 10(e) (arising from the production of products intended for human consumption")	Excluded from use as such (CMC10) because no ABP end point, unless covered by 202/1065 art.4.1(c) "processed animal protein of Cat.3 materials which fulfils". Could be used as input to CMC3, 5, 13 if ABP end point is achieved by the composting / digestion / combustion process.	Not authorised: not included in the list of "Products or by-products of animal origin".	?
Fish meal	In Norway, dried milled bone-rich fish material is included in "fish meal"	?	ABP Cat. 3. Not included as such in SANTE Delegated Act 2023/1065 = no ABP end point for use as fertiliser is defined. However, depending on processing, may be covered by art. 4.1(c) "processed animal protein of Category 3 materials …".	Excluded from use as such (CMC10) because no ABP end point, unless covered by 202/1065 art.4.1(c) "processed animal protein of Cat.3 materials which fulfils". Could be used as input to CMC3, 5, 13 if ABP end point is achieved by the composting / digestion / combustion process.	Authorised	?
Hydrolysed fish carcasses (non diseased fish)	Significant volumes. Generally used in animal feed (fish silage).	?	ABP Cat. 3.	Excluded from use as such (CMC10) because no ABP end point in 202/1065 Could be used as input to CMC3, 5, 13 if ABP end point is achieved by the composting / digestion / combustion process.		

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Material	Comment	Waste status	EU Animal By-Products Regulation 1069/2009	EU Fertilising Products Regulation 2019/2009	EU Organic Farming 2021/1165 (Annex II)	Animal Feed Regulations
Seaweed	Note: most seaweed is a macroalgae, so also covered under algae below.	Depends  - harvested - from beach cleaning ? - from beach below or above tideline ?	Not relevant	If not waste, not ABP, can be used as raw material for production of CMC1 materials (FPR FAQ 8.3). Irrespective of waste status, if not ABP, can be used under the conditions of CMC2 (plants and plant parts) and as inputs to CMCs 3, 4, 5, 13, 14 (under relevant conditions of	Authorised irrespective of waste status (products of plant origin …)	?
Cultivated algae using waste as substrate or input to supply nutrients, CO2, water, heat.	Algae grown to purify wastewater. Algae grown using industrial CO <sub>2</sub> offgas input or biogenic offgas (e.g. livestock stable offgas)	????? Gas is not waste (excluded by art. 2.1(a) of Waste Framework Directive.	15, 14 (under relevant conditions of these CMCs). These conditions limit processing, so that by-products from processing involving chemicals (e.g. solvent extraction) are excluded from these CMCs. Such extracts from algae may be authorised under CMC1 if they are "co-products" but NOT if they are "by-products" (by CMC1 att. 1(d)), and will generally NOT be covered by CMC11 (By-Products) See also comments re. cyanobacteria exclusion from CMCs 2 and 4.If algae are grown using manure / manure digestate as substrate, are these "Derived products" under the ABP Regulation 1069/2009 art. 1.2 ?If not waste, not ABP, can be used as raw material for production of CMC1 materials (FPR FAQ 8.3). Maybe included in CMC2. Excluded from inputs to CMCs 3, 5, 13, 14 unless the processing was only by mechanical etc. means as specified in these CMCs.	Specified processing only Organically produced or sustainably collected CO <sub>2</sub> authorised for Organic plant cultivation but NOT for Organic algae	If algae are grown using manure or manure digestate as substrate, are these excluded by 767/2009 art. 6(1) and Annex III \$5 ? (excludes "Faeces, urine	
Wastes / by- products from processing of seaweed or algae		Waste / by-product		raw material for production of CMC1 materials (FPR <u>FAQ</u> 8.3). Maybe included in CMC2 if processing is as specified in CMC2. Excluded from inputs to CMCs 3, 5, 13, 14 unless the processing was only by mechanical etc. means as	cultivation ??? TBC	irrespective of any form of treatment or admixture".

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Material	Comment	Waste status	EU Animal By-Products Regulation 1069/2009	EU Fertilising Products Regulation 2019/2009	EU Organic Farming 2021/1165 (Annex II)	Animal Feed Regulations
Exclusion of "cyanobacteria"	FPR vocabulary is imprecise	NA	NA	FPR CMC2 and CMC4 exclude "blue- green algae (cyanobacteria)". CMCs 3 and 5 do not have this exclusion. Extracts can under certain conditions by used under CMC1. See <u>FAQ</u> 8.20. Accidental traces in green algae cultivation are not an issue. See <u>FAQ</u> 8.9.	NA	NA
Spent media/substrate from algae cultivation. Discarded batches from algae cultivation.	Possibly alkaline. Possibly high organic load	Waste / by-product				
Other ????						