

Legal status of nutrient recycling from aquaculture – fisheries wastes and by-products – ESPP v4/2025 - p. 1 /5

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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
Fish excrement (fish production aquaculture sludge)	<p>33 000 t/y of phosphorus in sludge from fish farms in Norway (PwC 2023).</p> <p>Sanitised, dried fish sludge is used in commercial organic fertilisers in Norway by the company Grønn Gjødse.</p> <p>Potential processes for struvite precipitation from aquaculture wastewaters have been tested, e.g. DOI.</p> <p>Aquaculture is expected to grow considerably over coming decades, as a space- and resource-efficient route to protein production, and at the same time pressure to capture waste rather than discharging into the sea is increasing.</p>	Waste	<p>Cat. 2 ABP ??</p> <p>NOT ABP manure.</p> <p>Excluded from the definition of manure in 1069/2009 art. 3.20.</p> <ul style="list-style-type: none"> appears to be an ABP by art. 3.1 of 1069/2009 because NOT excluded from definition of manure in 1774/2002 (Annex I Specific Definitions) health rules defining ABPs not intended for human consumption. 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 ...") <p>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. In this case, must respect the specific requirements (marking, Veterinary certificate...) of 142/2011</p>	<p>If (!) it is considered an ABP (see column to left), then today can (presumably ?) 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 2023/1605 arts. 3(a), 3(b) or 3(c).</p> <p>Today (probably ?) 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" (2023/1605 art. 3(d) but fish excrement is excluded from "manure" under the ABP regulation 1069/2009.</p> <p>Can be used today as input for recovery of certain mineral salts as specified in CMC15 materials from offgases (CMC15 art. 2(b)), because gases are not ABPs.</p>	<p>In all cases "factory farming" prohibited. Does this exclude all aquaculture slurry ?</p> <p>Use "as such" as fertiliser is NOT authorised (only "farmyard manure" and "liquid animal excrements" – fish excrement / aquaculture slurry is neither of these).</p> <p>Use as input to composts is authorised ("animal excrements").</p> <p>Use as input to digestate is NOT authorised (not included in "animal by-products ... as listed")</p>	<p>767/2009 art. 6(1) and Annex III ch.1 para. 5: excludes "Faeces, urine... irrespective of any form of treatment or admixture".</p> <p>Does this exclude for example: incineration of fish slurry -> chemical recovery of calcium phosphate for animal feed from the ash</p>
Non-fish aquaculture slurry		Waste	<p>Cat. 2 ABP and "manure".</p> <p>Not excluded from definition of manure in 1069/2009 -> Cat. 2 ABP.</p>	<p>In future: could be included in "Processed Manure" under the TBD conditions of future CMC10</p>		

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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
Shellfish: shells without soft tissue	Potential as biostimulants (chitin) and input for organic fertilisers.	Waste	<p>NOT an ABP: specifically excluded from 1069/2009 by art. 2.2(f).</p> <p>ABP status is not clear for organic substances extracted from shells (i.e. processed from the shells, not from shellfish organic material). For instance, France (DGAL) considers glucosamine (ref 13.2.8 in catalogue of feed materials 2022/1104) as PAP but there is no consensus at EU level. This is despite glucosamine not containing proteins (glucosamine is a nitrogen containing sugar).</p>	<p>Shells as such (e.g. ground) or processed could fit into CMC1 but ONLY IF not considered as “waste” or “by-product”.</p> <p>Could be used as input to compost or digestate (CMC3 or 5) or pyrolysis (CMC14) if processed only as specified in these CMCs.</p> <p>Recovered mineral (calcium carbonate) does not fit under CMC15 because the shells are not generated from a production process as defined in CMC15.</p>	<p>Mollusc wastes, shellfish chitin: Organic or sustainable fisheries only.</p> <p>FiBL “Basic admission criteria for fertilizers, soil conditioners and crop management tools”:</p> <p>§3.6 "For algae, algae products, mollusc waste and chitin (polysaccharide obtained from the shell of crustaceans) a declaration on origin is required"</p> <p>§3.4.1 "Magnesium and calcium carbonate of natural origin are allowed. This includes also mollusc and egg shells. These raw materials may not be processed with acids or other synthetic substances. Persistent flocculants are not allowed (e.g. polyacrylamide)."</p>	<p>Shellfish shells can be used in animal feed as specified under ref 11.1.2 "Calcareous marine shells" in catalogue of feed materials 2022/1104 (i.e. ground or granulated).</p>
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. here).	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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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 2023/1605 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 2023/1605 = 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 2023/1605 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 2023/1605 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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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 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 art. 1(d)), and will generally NOT be covered by CMC11 (By-Products).. See also comments re. cyanobacteria exclusion from CMCs 2 and 4.	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 CO2 offgas input or biogenic offgas (e.g. livestock stable offgas)	????? Gas is not waste (excluded by art. 2.1(a) of Waste Framework Directive.	If algae are grown using manure / manure digestate as substrate, are these “Derived products” under the ABP Regulation 1069/2009 art. 1.2 ? Gas is not ABP.		Specified processing only Organically produced or sustainably collected CO2 authorised for Organic plant cultivation but NOT for Organic algae cultivation ??? TBC	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 ... irrespective of any form of treatment or admixture”.
Wastes / by-products from processing of seaweed or algae		Waste / by-product		If not waste, not ABP, can be used as raw material for production of CMC1 materials (FPR FAQ 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 specified in these CMCs.		

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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 be used under CMC1. See FAQ 8.20. Accidental traces in green algae cultivation are not an issue. See FAQ 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 ????						