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Events

10-12 June 2025, Bergen, Norway: nutrients in aquaculture and fisheries workshop

ESPP workshop, with partners in Norway and UNEP uPcycle, on nutrient management in aquaculture: fish feed, seafood processing and fish sludge valorisation, Norway & online, 10-12 June 2025, covering nutrient flows, environmental best practice, phosphorus recycling, regulatory challenges. The workshop will contribute to the United Nations (UNEP) project uPcycle, leading to a UNEP white paper on phosphorus sustainability in aquaculture. Site visits to in-sea fish farm with sludge recovery, research installations, fish sludge processing.

A few slots are still available for presentations of fish and aquaculture industry nutrient sustainability actions, fish feed industry, fish sludge nutrient recycling. Programme: <https://phosphorusplatform.eu/AquacultureFisheries>

9th April: Flashphos demonstration of sludge drying for P₄-recovery

Demonstration of pilot sewage sludge dryer – grinder (input 50 kg/h wet sewage sludge), presentation of Flashphos P₄ recovery project and operating experience in sludge processing to date. Stuttgart and online. Discussion with experts about sludge treatment, P-recovery and challenges of novel recycling approaches. The Flashphos (EU Horizon 2020) aims to demonstrate recovery of white phosphorus from dried sewage sludge at 250 kg/h pilot scale ([see ESPP eNews n°94](#)). The preparation of the sewage sludge, to a dry fine, homogenous powder, is key to the process, to allow fast gasification in the FlashReactor using the organic carbon in the sewage sludge for heat energy. This prepares the minerals for P₄ release with a reducing agent (coke or similar) in the Refiner.

Flashphos (EU Horizon 2020 R&D project, 2021-2026) <https://flashphos-project.eu>

Demonstration event organised by University of Stuttgart, Buss-SMS-Canzler GmbH and Steinbeis Europa Zentrum. 9th April 2025, 9h30 – 16h15, Stuttgart, Germany, and online. In English. Free. Agenda, registration: <https://eveeno.com/flashphos>

17-18 June 2025: European Wastewater Management Conference



ESPP will speak at Europe’s leading conference for wastewater treatment operational experience, solutions and technologies, Telford International Centre, UK, 17-18 June 2025.

Early bird registration to 11th April 2025 <https://ewwmconference.com/>

Consultations

Open: EU Fertilising Products Regulation – audit frequencies

EU public consultation, open to 27th March 2025, on change to audit requirements for recovered materials (D1), to avoid excessive audit frequency for high volumes, and change to ammonium nitrate fertilisers conformity assessment requirements (explosive potential).

“EU fertilising products - amendment of conformity assessment procedures”, public consultation, **open to 27th March 2025**
https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/14548-EU-fertilising-products-amendment-of-conformity-assessment-procedures_en

Open: Evaluation of EFSA

Public consultation open to 1st April 2025 for the evaluation of EFSA (European Food Safety Agency).

See [ESPP eNews n°94](#).

Questionnaire plus possibility to input general or specific comments (max. 5 000 characters) and/or upload documents or input papers.

“European Food Safety Authority – evaluation of performance 2017-2024”, EU public consultation **open to 1st April 2025**
https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/14068-European-Food-Safety-Authority-evaluation-of-performance-2017-2024_en

Open: US EPA consultation on PFAS in sewage sludge and water

Public consultation open to 16th and 25th April 2025 (respectively) on US EPA draft risk assessment of PFOA and PFOS in sewage sludge used in agriculture, forestry or landfilled and draft water quality limits for PFOA and PFAS. PFOA (perfluorooctanoic acid) and PFOS (perfluorooctane sulfonic acid) are both part of the PFAS family (perfluoroalkyl and polyfluoroalkyl substances). The conclusions will inform future US regulatory action under the Clean Water Act. The US EPA classified both PFOA and PFOS as likely carcinogenic in 2024 and concluded that they can have a range of other impacts (see here [PFOA](#) and [PFOS](#)). The draft risk assessment concludes that land use of sewage sludge (e.g. digested or composted sludge) could result in human health risks, from PFOA and PFOS, exceeding acceptable thresholds for both cancer and non-cancer risks (based on 40 annual applications at 10 tDM/ha/y, the median US sewage sludge application rate). Human health risk levels were exceeded in scenarios of application to grazing land or for food with risks resulting from PFAS levels in e.g. drinking water, fish, beef, milk, eggs, fruit, vegetables. In some cases, risks levels were exceeded with only one application of sewage sludge containing 1 ppb PFAS. Risk estimates for some human intake pathways can exceed EPA acceptable thresholds by “several orders of magnitude”, including via drinking water, contaminated milk from grazing, eating fish or fruit and vegetables. The EPA underlines the need for prevention at source: monitoring of PFAS in sewage works and pre-treatment of industrial sources.

“Draft Sewage Sludge Risk Assessment for Perfluorooctanoic Acid (PFOA) and Perfluorooctane Sulfonic Acid (PFOS)”, US EPA public consultations **open to 16th and 25th April 2025** <https://www.epa.gov/biosolids/draft-sewage-sludge-risk-assessment-perfluorooctanoic-acid-pfoa-and-perfluorooctane>

Open: EU consultations on simplification of sustainability reporting and taxonomy

Public consultations on modifications to EU Sustainability Reporting Standards and to the EU Taxonomy Regulation annexes, as part of the Commission’s ‘Omnibus’ simplification package. This package announces simplifications and wider exemptions for the CSRD (Corporate Sustainability Reporting Directive) and the EU Taxonomy, CBAM (Carbon Border Adjustment Mechanism) and due diligence. The Commission estimates that the proposed simplifications will bring over 6 billion € reduction in administrative costs and mobilise 50 billion € public and private investment. It is part of the Commission’s commitment to reduce administrative burdens by 25% and by 35% for SMEs. Key points include:

- Removing 80% of companies from CSRD, leaving only the largest companies
- Ensuring that larger companies’ reporting obligations and due diligence do not burden SMEs in the value chain
- Simplify the DSNH (Do NO Significant Harm) criteria
- Exempt smaller importers (90% of companies) from CBAM
- Simplify calculation of embedded emissions
- Extend implementation deadlines
- Various other simplification, coherence and harmonisation changes

European Commission ‘Omnibus Package’ announcement 26th February 2025 “Commission simplifies rules on sustainability and EU Investments” https://ec.europa.eu/commission/presscorner/detail/en/ip_25_614?link_id=a2a47574-5401-4cc8-95c7-0c429f73aeed

EFRAG public consultation (under mandate from the European Commission) on simplification of the European Sustainability Reporting Standards (ESRS) **open to 6th May 2025** <https://survey.alchemer.eu/s3/90824354/ESRS-Set-1-revision-Questionnaire-for-public-feedback>

EU public consultation, **open to 26th March 2025**, on technical modifications to EU Taxonomy Regulation annexes
https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/14546-Taxonomy-Delegated-Acts-amendments-to-make-reporting-simpler-and-more-cost-effective-for-companies_en

Open: EU consultation on next EU budget framework

EU public consultation, open to 6th May 2025, on post-2027 Multiannual Financial Framework (MFF), to inform the architecture of the EU budget for the next 5-10 years. Six different consultations are open, addressing EU policies on Member States and Regions (inc. agriculture), external action, education / civil society, civil protection and crisis response, single market, budget performance.

On policies with Member States and Regions, the consultation is a short questionnaire (11 questions) asks for opinions on relative importance of challenges from transport and security to decarbonising the economy (one of the 22 options proposed is "Maximising the potential of the circular economy"), obstacles and effectiveness of EU funding, specific objectives of different policies (Cohesion, Agriculture = CAP, fisheries & marine, transport). As well as the short questionnaire, it is possible to submit a free document or position paper.

The consultation questionnaire on 'budget performance' addresses in particular gender equality and climate & environment (e.g. "do no harm" principle).

"EU's next long-term budget (MFF) – performance of the EU budget", public consultation, open to 6th May 2025

https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/14526-EUs-next-long-term-budget-MFF-performance-of-the-EU-budget_en

Closed: EU call for evidence on green transformation for industry and livestock

Non-public call for input, data or examples on green transformation pathways, plans and investment needs to reduce greenhouse emissions and increase circularity of IED installations (industrial sites, large livestock farms) Two studies are launched by the European Commission to evaluate the investments needed by different industries (covered by IED 2010/75, [as updated by Directive 2024/1785](#)) "to achieve carbon neutrality, zero pollution and circular economy objectives", and to support definition of "transformation plans" for these industries. IED covers both industrial sites subject to operation permitting (IED = "Industrial Emissions Directive") and also, since 2024, large livestock farms – a total of around 75 000 industrial and livestock installations across Europe. Information requested includes defining transformation pathways for IED covered industries (including intensive livestock), costs of transformation, content of transformation plans, proposed benchmarks and targets (may be linked to BAT), available technologies, issues of access to funding.

If you are interested, please contact ESPP (member of the EU IED Forum) and we will send you the consultation documents, including contacts for submitting information, or you can send information to ESPP and we will forward info@phosphorusplatform.eu. Formal deadline closed 14th March.

ESPP input submitted: EU public consultation on water resilience

ESPP input underlines the importance of Circular Economy (recycling of water and nutrients) in improving water resilience, and that climate change will increase needs for both nutrients and irrigation water. Climate change is expected to enhance nutrient mineralisation, so increasing nutrient losses, and increase crop nutrient uptake due to increased atmospheric CO₂, thus directly linking water resilience to nutrient management and fertiliser use. ESPP suggests that the EU Water Resilience Strategy should take into account the need to reduce EU dependency on imported fertilisers, the importance of reducing pollutants at source, the [Critical Raw Materials Act](#), the European Commission's announced EU Circular Economy Act and the recast Urban Waste Water Treatment Directive [2024/3019](#) which refers to water resilience in Recital 29 and art. 15 and requires the definition of Phosphorus Reuse and Recycling Rates in art. 20. Concerning pollution at source, ESPP states that this is a key prerequisite for water reuse, for nutrient recycling and for circularity of other materials recovered from waste water treatment. Industrial chemicals which pose obstacles to circularity or to water reuse should be phased out rapidly, with authorisation only for very limited authorisations for limited essential uses where loss to the environment is not expected until alternatives can be developed. In particular, the restriction of PFAS announced in 2020 (COM(2020)667) should be implemented rapidly, banning all non-essential uses.

"European Water Resilience Strategy", public consultation, closed 4th March 2025. https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/14491-European-Water-Resilience-Strategy_en

ESPP input submitted (1 page): www.phosphorusplatform.eu/regulatory

ESPP input submitted: Evaluation of public procurement directives

ESPP input that the EU's three public procurement Directives should be updated to better facilitate and incite environmental objectives in public purchasing selection, in particular to support the circular economy, in coherence with the Commission's "Vision for Agriculture and Food" [COM2025\(75\)](#) which fixes the aim of strengthening the role of Public Procurement with a "best value" approach to reward quality and sustainability, including certified Organic products and short food supply chains, and with the Enrico Letta [report April 2024](#) "Much more than a market - Speed, Security, Solidarity – Empowering the Single Market to deliver a sustainable future and prosperity for all EU Citizens". ESPP suggests that consideration of environmental aspects be no longer an option in Public Procurement, subject to difficult conditions, but should be required wherever feasible, including taking into account circularity, use of secondary raw materials and EU Critical Raw Materials, as well as the bioeconomy and short supply chains, local, regional and EU production.

See [ESPP eNews n°94](#).

“Public procurement directives – evaluation”, EU public consultation, closed 7th March 2025 https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/14427-Public-procurement-directives-evaluation_en

ESPP input submitted (1 page): www.phosphorusplatform.eu/regulatory

ESPP input submitted: UK Parliament Inquiry on Nitrogen

ESPP input underlined synergies between reducing nitrogen losses, recycling nitrogen and development of renewable manure biogas, as well as the need to recycle N to reduce dependency on imported fertiliser and natural gas. ESPP underlined that reducing nutrient losses is signed into the United Nations COP15 Kunming-Montreal convention Global Biodiversity Framework, December 2022 ([ESPP eNews n°74](#)) and that reducing N losses can be combined with N-recovery (e.g. ammonia stripping/scrubbing from manure offgases) or with improved recycling of N in wastes (reduce N losses from manure or digestates during field application, e.g. by acidification of manure or by injection into soil rather than surface spreading – so increasing the effective recycling rate). Input summarised conclusions of the two international workshops on nitrogen recycling organised by ESPP in 2023 (SCOPE Newsletters n°s [145](#) and [148](#)) and the operational summary of literature relevant to N-recycling in SCOPE Newsletter n° [147](#). ESPP also underlined the importance of ensuring that recovered nutrients find a market, commercially (competition with ‘virgin’ mineral nutrients), in regulations and as regards product quality. See ESPP’s [proposals](#) (developed with wide stakeholder consultation) for policies to facilitate nutrient circularity (input to the upcoming EU Circular Economy Act) and for “market pull” for recycled nutrients.

UK Parliament (House of Lords Environment and Climate Change Committee), Call for Evidence on Nitrogen, closed 7th March 2025 <https://committees.parliament.uk/committee/515/environment-and-climate-change-committee/news/205099/environment-and-climate-change-committee-launches-new-inquiry-into-nitrogen/>

“UKWIR provides evidence for the House of Lords Environment and Climate Change Committee Nitrogen Inquiry, 14th March 2025 <https://ukwir.org/hol-0>

ESPP input submitted (4 pages): www.phosphorusplatform.eu/regulatory

ESPP input submitted: ash-recovered phosphates in Organic Farming

ESPP input to EU consultation on use of calcium phosphates from sewage sludge ash in certified Organic Farming: ESPP supported the proposed authorisation and requested consideration of other recycled nutrient materials.

ESPP welcomed the proposed authorisation of calcium phosphates derived from sewage sludge ash as fertiliser in Organic Farming, based on the positive EGTOP Opinion of March 2024, and requested that this modification of the Organic Farming inputs regulation 2021/1165 be implemented rapidly, with the text as proposed. ESPP noted that the proposal contributes positively to sustainability and productivity of Organic Farming, to stewardship of the EU Critical Raw Material “Phosphate Rock” (Critical Raw Materials Act 2024/1252) and to EU Circular Economy objectives.

In order to ensure safety and farmer confidence, ESPP supported the proposal that the recovered calcium phosphate should respect the EU Fertilising Products Regulation quality criteria and contaminant limits.

ESPP noted that the wording “calcium phosphate” can mean any inorganic compound (derived from sewage sludge incineration ash) consisting of calcium, phosphorus, hydrogen and oxygen, e.g. monocalcium phosphate, dicalcium phosphate, octacalcium phosphate, amorphous calcium phosphates, hydroxyapatite, single super phosphate, triple super phosphate.

ESPP requested future consideration, for Organic Farming, of calcium phosphates recovered from ash from animal by-products and of “Calcined Phosphates” from sewage (EGTOP gave a positive [opinion](#) in 2016 recommending authorisation for use in Organic Farming). ESPP suggested that EGTOP consider all ash-derived phosphates respecting the EU FPR (PFC1 mineral phosphate fertiliser criteria and CMC13 criteria, possibly subject to other specific Organic Farming criteria such as exclusion of manure from ‘factory farming’, solubility criteria ...). This would avoid the current one-by-one assessments which are slow and time-consuming.

“Organic production – amended list of authorised products and substances”, EU public consultation closed 4th March 2025. https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/14024-Organic-production-amended-list-of-authorised-products-and-substances_en

ESPP input to public consultations: www.phosphorusplatform.eu/regulatory

Policy

European Commission “Vision for Agriculture and Food”

Strategy document aims for an “attractive, competitive, resilient, future-orientated and fair” agri-food system, including climate, carbon credits, nature and environment protection, nutrient management and nutrient circularity. The vision aims to achieve “strategic autonomy and food sovereignty” and to reconcile food security, food safety, farm incomes and climate and environmental objectives (including soil health, clean water and water scarcity, biodiversity), whilst emphasising simplification, competitiveness and digitalisation. Vulnerabilities identified include dependency on imports for fertilisers, feed and energy, in particular for high-protein feeds and fertilisers. Fertilisers are identified as “essential for food production and security”, and pose price stability problems for farmers, with the EU increasingly dependent on a small number of import supplying

countries. Support is necessary for low-carbon fertilisers and recycled nutrients. Farm nutrient management and nutrient circularity are cited objectives. The bioeconomy, carbon farming, nature credits and renewable energy production are seen as key areas for innovation and additional sources of income for farmers.

The vision indicates that CAP (Common Agricultural Policies) currently account for 23% of average EU farm income and confirms the CAP as the key tool for taking forward policy objectives.

ESPP comment: as often with such strategy documents, there is a feeling that everything has been included to please everyone (and that ESPP has selectively cited a few paragraphs on nutrients and fertilisers found somewhere in the 27 pages). However, the following do appear as announced actions (rather than 'wishes'), whilst underlining that one-size-fits-all solutions are not applicable to farming across Europe and that actions must therefore be largely delegated to national, regional and local authorities:

- Carbon credits
- Nature credits
- A voluntary on-farm environmental benchmarking system “On-Farm Sustainability Compass”
- CAP reduction of farm subsidy disparities (capping for big farms), focus on young farmers and on farming in areas of “natural constraints”. CAP to focus on incentives and investments, rather than “conditions”
- Alignment of standards for imported products, to ensure fair competitiveness of EU farms, e.g. presence of pesticides banned in the EU, animal welfare conditions
- Support for EU fertiliser production
- Support for low-carbon fertilisers and recycled nutrients, in particular appropriately used and treated digestates
- Reinforcement of agricultural crisis funding mechanisms (European Food Security Crisis Mechanism, agricultural reserve)
- Strengthening the role of Public Procurement with a “best value” approach to reward quality and sustainability, including certified Organic products and short food supply chains
- Work stream on “excellence livestock production chain” addressing global competition, imports/exports, climate and environmental footprint, maintenance of extensive grasslands (valuable for climate, landscape, biodiversity), sustainable production models
- Addressing nutrient pollution hotspots with territorial approaches to management and control of livestock farming and support for extensification, in the context of the evaluation of the Nitrates Directive due end 2025.

“Commission presents its roadmap for a thriving EU farming and agri-food sector”, [press release](#), 19th February 2025 and European Commission Communication COM 2025(75) – 27 pages “A Vision for Agriculture and Food. Shaping together an attractive farming and agri-food sector for future generations” [here](#).

State of Europe’s waters

The European Environment Agency (EEA) report on the state of waters 2024 says the EU needs to accelerate actions to improve water resilience and water quality. Less than 30% of waters achieve good chemical status, with little improvement over the last decade. Climate change will accentuate pressures on water resources. Member States report that the most significant pressure on both surface and groundwater resources is agriculture: intensive use of nutrients and pesticides. Diffuse agricultural pollution, in particular pesticides and nutrients, is important in impacting water quality, as are long-lived pollutants, in particular mercury and brominated flame retardants (each of which alone are responsible for nearly half of water body quality failures – one parameter failure = quality failure). Agriculture is considered more than twice as impacting on surface waters than wastewater discharges, and also as having high impact on groundwaters. Agricultural nutrient losses (leaching/run off and in soil erosion) are more than four times wastewater discharge for nitrogen and more than two times for phosphorus. The EEA notes that “high concentrations of nitrogen and phosphorus and contamination by organic substances from manure and sewage continue to have serious ecological effects in Europe. These include toxic algal blooms and oxygen depletion”. Nearly 20% of surface waters failed nutrient quality standards and nearly 50% of monitoring sites are eutrophic or susceptible to become eutrophic. EEA notes that climate change will accentuate nutrient losses from agriculture: “Heavy rain events can also cause drastic erosion of phosphorus-rich agricultural soils and loss of manure from animal husbandry, resulting in additional phosphorus inputs into surface waters”. The importance of the Farm-to-Fork and Biodiversity Strategy targets to reduce nutrient losses and pesticide use by 50% by 2030 in addressing water quality failures.

EEA indicates that “Recycling nutrients from sewage sludge and manure, such as phosphorus as a non-renewable resource, increases food security while simultaneously reducing nutrient enrichment of natural water bodies and risks of eutrophication” noting that “sewage sludge can be used beneficially for its nutrients and organic matter content. Similarly, manure from livestock rearing can be recovered. Common uses include land application as a soil conditioner or fertiliser and, in some cases, for energy recovery through biogas production or incineration”.

“Europe’s state of water 2024. The need for improved water resilience”, European Environment Agency, EEA Report 07/2024 <https://dx.doi.org/10.2800/02236>

European Commission Report on Water Framework Directive Implementation

Fewer than 40% of EU surface waters are in Good Ecological Status and fewer than 30% in Good Chemical Status, with nearly no improvement over the last six years. Member States are asked to reduce agricultural nutrient pollution. The Commission report is based on detailed analysis of Member States' River Basin Management Plan (RBMP) reports and covers c. 90% of EU surface and ground water bodies (97 000 surface water bodies, 15 000 groundwater bodies). The Commission notes that apparent the lack of improvement may be partly because of better monitoring, and because Directive applies the "one out all out approach" (failure for one parameter means classification as overall Quality failure), but that it also results from inadequate measures taken to reduce pollution and inadequate progress in their implementation. Ecological quality status failure (waterbodies not in Good Ecological Status or Good Ecological Potential) is particularly due to eutrophication, confirming findings from the Nitrates Directive reporting (2021) which indicated 30 – 40 % of freshwater surface waters and over 80% of marine waters were eutrophic. For chemical quality status, pollution by mercury, polycyclic aromatic hydrocarbons (PAHs) and brominated flame retardants (PBDEs) are particularly cited, as well as heavy metals, biocides and pesticides and other persistent organic pollutants (e.g. hexachlorobenzene).

Pressures on surface water bodies identified by member states include atmospheric deposition of pollutants (89% of waterbodies), morphological changes (drainage, irrigation, dams, etc, 57%), agricultural pollution (32%) and urban wastewater treatment or non-connection (14%, 9%).

Considering nutrients, it is indicated that nitrates from agriculture (fertilisation, manures, unsustainable land management practices) are the biggest pollutant of groundwater and a problem in surface waters, whereas for phosphorus the biggest source to marine waters remains urban wastewater.

The report reminds that CAP 2023-2027 measures should reduce agricultural pollution, but for the period covered by this report, CAP funding has been insufficient and delayed. It is estimated that CAP 2022-2027 Eco-Schemes and AECCs (Environmental, climate-related and other management commitments) supporting improved nutrient management are planned to cover over 15% of EU agricultural area.

The report notes that "No Member State is using thresholds for nutrient concentrations to assess the good ecological status of surface waters, and only some are determining the required load reduction upstream in the relevant river basin".

The Commission concludes that groundwaters are largely in good status, but that "surface waters are in a highly critical situation" and that compliance with the Water Framework Directive's quality status objectives will not be achieved by the 2027 deadline. Key actions needed are identified as increasing funding for implementation of River Basin Management Plan 'Programme of Measures' and integration of water into other legislation.

Over 40 action recommendations are given including: "stepping up action to reduce nutrient pollution, including by setting and achieving maximum nutrient loads in all river basin districts, in line not only with the WFD (Water Framework Directive) but also the MSFD (Marine Strategy Framework Directive) and Nitrates Directive".

A Commission Report on the Marine Strategy Framework Directive (MSFD), issued in parallel to the report on the Water Framework Directive, also underlines that nutrient pollution and eutrophication remain major challenges, especially in the Baltic, North East Atlantic and Mediterranean. It is noted that nutrient pressures will change with climate change. One of 24 recommendation actions is "stepping up action to reduce nutrient pollution to achieve the objectives of the MSFD, WFD and the Nitrates Directive".

"Protect waters and better manage flood risks", European Commission press release IP/25/342, 4th February 2025

https://ec.europa.eu/commission/presscorner/detail/en/ip_25_342

Report "on the implementation of the Water Framework Directive (2000/60/EC) and the Floods Directive (2007/60/EC)", European Commission, COM(2025)2, 4th February 2025 <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM%3A2025%3A3%3AFIN&qid=1738678027971>

Report "on the Commission's assessment of the Member States' programmes of measures as updated under Article 17 of the Marine Strategy Framework Directive (2008/56/EC)", European Commission, COM(2025)3, 4th February 2025 <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM%3A2025%3A3%3AFIN&qid=1738678027971>

Nutrient recovery

UKWIR report: valorisation of potable water treatment sludges

UK Water Industry Research report analyses current routes and possible improvements for valorisation of iron and aluminium sludges from drinking water treatment (these sludges are completely different from and are not related to sewage sludge). At least 115 000 t/yDM of such sludges are generated in the UK. They contain 2 – 8% dry solids, up to 41% iron or 21% aluminium and significant levels of organics (13 – 26% total carbon). Currently most such iron sludges are discharged to sewers (the iron content contributes to sewage works phosphorus removal and improving settling, so partly substituting virgin coagulant consumption) and the majority of aluminium sludges are spread to land (soil improver, land reclamation). Discharge to sewers can also have negative impacts on sewage treatment (increased sludge production, deterioration of biological treatment, acidity for aluminium sludges). A significant potential valorisation route for iron sludges is addition to anaerobic digesters, with methane generation from organics in the sludge and iron acting to improve anaerobic digester operation and suppress H₂S. However, "waste" status of the iron sludge is an obstacle to this valorisation route. Other

valorisation routes identified include incorporation into brickmaking, ceramics or construction materials, often after removal of organics (e.g. calcination). Processes to chemically separate iron from phosphorus in such sludges are discussed, in particular sulphuric acid digestion followed by purification (membranes, ion exchange) but these are at the lab scale and to date not economically viable.

“Circular Economy – water treatment sludges”, UKWIR (UK Water Industry Research, the UK water industry’s joint research organisation), 67 pages, 2024, Report Ref. No. 24/SL/09/02 <https://ukwir.org/water-industry-research-reports>

UN FAO report on nitrogen in agri-food systems

Report on nitrogen in the global food system underlines the importance of dietary choices, spatial misbalances of livestock production and the need to recycle agri-food wastes to livestock feed. FAO (United Nations Food and Agriculture Organisation) explains that nitrogen loss (e.g. nitrates to water, ammonia to air) impact the environment, climate and health. Improving nitrogen management is considered essential to achieving UN Sustainable Development Goals, in particular those relating to water, climate, health and hunger, including increasing food production in lower-middle income countries. FAO estimates that global Nutrient Use Efficiency (NUE) in crop systems is just over 60% (N in output crops / N inputs) and in livestock is 4 – 45% (N in animal – eggs – dairy / N in feed). Overall, N in human food produced is around 30% of global mineral fertiliser inputs and around 15% of total inputs (including biological N fixation and atmospheric deposition). Illustrated data on N international trade is provided and the main cause of N losses in livestock production is identified as feed crop production (with associated mineral fertiliser use and land change). The report notes the potential for reducing protein content of livestock diets (especially cattle), increasing recycling of agri-food wastes to feed (especially pigs) and of improving manure management (e.g. reducing ammonia losses in storage, more efficient application to crops). Priorities for circularity are identified as: reduce food waste, use FLW (food loss and waste) in animal feed (whilst ensuring food chain safety), use arable land to produce human food crops not animal feed and use livestock to convert non-food biomass (e.g. grass) to human food. Promising routes for progress noted include low-emission production of mineral N fertilisers, processing manure, agri-food wastes and industrial wastes to bio-based fertilisers. The need for quality control and appropriate application rates and methods are underlined for organic fertilisers.

“Sustainable nitrogen management in agrifood systems”, FAO (Food and Agriculture Organisation of the United Nations), 130 pages, 2025 <https://doi.org/10.4060/cd3388en>

See also *“Guidelines on the role of livestock in circular bioeconomy systems”, FAO LEAP (Livestock Environmental Assessment and Performance in ESPP eNews n°90 and “Nutrient flow and associated environmental impacts in livestock supply chains. Guidelines for assessment”, FAO in [ESPP eNews n°37](#).*

Phosphorus, food and health

Mouse maternal high phosphorus diet impacts offspring mineral metabolism and growth

High phosphorus diet either before or during pregnancy of female mice resulted in offspring with lower gut P uptake, modified levels of blood hormone levels related to mineral metabolism and lower body weight. The female mice were fed either normal (control = 0.8% P) or high-P (1.5% P) diet either for 21 days before pregnancy, or during pregnancy, then normal-P diet during breast feeding of offspring (3 weeks). After weaning, offspring were fed a normal-P diet 3-10 weeks. The high-maternal-P offspring showed no difference in blood plasma P concentrations compared to normal-maternal-P offspring, but showed lower urine P excretion corresponding to reduced gut P-transporter mRNA expression. They also showed modified blood levels of parathyroid hormone, fibroblast growth factor 23 (FGF23) and vitamin D, which are all three related to hormonal mineral metabolism control. Body weight of the high-maternal-P offspring was significantly lower at 3, 6 and 10 weeks of age. The authors note that these animal study results may not transpose to humans and that in this trial only male offspring were studied.

“Maternal excess dietary phosphate intake in the periconceptional period is a potential risk for mineral disorders in offspring mice”, M. Hayashi-Suzuki et al., Scientific Reports, 2025, 15:8844 [DOI](#).

Mouse high P diet leads to heart disease risks

Diets on high phosphorus (2%) showed heart modifications, including atrial fibrosis and oxidative stress, compared to mice on a normal phosphorus diet (0.6%), for both kidney-impaired and non-impaired mice. 8 week old male mice were fed the different diets for 10 weeks, followed by 4 weeks normal-P diet. Half the mice in each group were operated to remove 5/6 of kidney function (partly nephrectomised). The authors conclude that the high P diet increased atrial fibrillation risk. Biological signalling mechanisms are discussed (STAT3, NFκB, Nox4) and collagen expression. The authors note that mouse serum phosphorus is considerably higher than in humans and that previous studies have shown that high P diets in mice lead to increased serum P concentrations, even with non-deteriorated kidney function, whereas this is uncommon in humans. Therefore, high diet P in healthy humans may not lead to similar atrial risks, whereas it is likely to do so for humans with poor kidney function.

“High-phosphate

diet causes atrial remodeling and increases atrial fibrillation vulnerability via STAT3/NF-κB signaling and oxidative stress”, Y.-J. Hsu et al., *Acta Physiologica*. 2023;00:e13964 [DOI](#).

Sustainable development of the food & beverage industry

ESPP participated in the 13th Sustainable Development in the Food & Beverage Industry Summit (February, Brussels), presenting on nutrient circularity in the agri-food sector, together with Pär Larshans (Ragn-Sells). The event brought together around 60 participants, including representatives from Ferrero, Danone, Heineken, Unilever, Arla Foods, Fyffes, and OSI Group, to discuss sustainability challenges and strategies across the food value chain. Discussions focused on corporate environmental stewardship, sustainable sourcing, and the role of data in driving innovation. Companies exchanged views on ways to measure and reduce the environmental footprint of food production, with attention to eco-design, procurement, decarbonisation, and regenerative agriculture. A key takeaway was the need for reliable data and assessment tools to advance circularity and sustainability goals.

13th Annual Sustainable Development in the Food & Beverage Industry Summit, 4-5 February 2025, Brussels, [website](#)
 ESPP slides available on [slideshare](#).

Commiserations

Waltraud Hermann, wife of ESPP Secretary and previously President, Ludwig Hermann, sadly died on 13th March. Many ESPP contacts met Waltraud Hermann and appreciated her energy and enthusiasm. We will regret her and all our thoughts are with Ludwig and his family. If you wish to make a gesture, Waltraud wished for donations to the association SOS Mitmensch, Austria, <https://www.sosmitmensch.at/site/ueberuns> IBAN AT12 2011 1310 0220 4383 office@sosmitmensch.at

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